An Ethnographic Exploration of Ship - Shore Communication

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This thesis is submitted in fulfilment of the degree of

Doctor of Philosophy

Declaration

This work has not previously been accepted in substance for any degree and is not concurrently submitted in candidature for any other degree.

Signed.. (candidate)

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Dedication I – The Divine Muses

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Dedication II

सत् साहिब[1]

For the VTS[2] *operators*[3] standing by on VHF[4] channel one five[5]

[1] 'Sat Sahib' (transliteration), 'Truth is God' (translation) – a greeting used to wish the people of my community. Throughout the thesis, transliterated text is presented in blue colour, followed by the translation.

[2] Vessel Traffic Service (VTS)

[3] The research student is aware that VTS operators can be men or women, however, the VTS operators employed in the port(s) studied were men and this thesis refers to them as such.

[4] Very High Frequency (VHF) radio

[5] Anonymised channel number. The resemblance to the working VHF radio channel of any port is co-incidental and unintentional.

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This thesis would not have been possible without the magnanimity of the VTS operators and supervisors, who opened a window to their world for me. I am humbled by their generosity and this thesis is in part, dedicated to them. I am also grateful to the port officials who sanctioned access to the port facility for my study.

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Aditi Kataria
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List of Abbreviations and Acronyms

AIS	Automatic Identification System
AISM	International Association of Maritime Signalling
ATLAS.ti	Qualitative data analysis software
AtoN	Aids to Navigation
BSA	British Sociological Association
CAQDAS	Computer Aided Qualitative Data Analysis Software
CDC	Continuous Discharge Certificate
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
CPA	Closest Point of Approach
DGLL	Directorate General of Lighthouses and Lightships, India
DG Shipping	Directorate General of Shipping, India
ECDIS	Electronic Chart Display and Information System
EMSA	European Maritime Safety Agency
ESRC	Economic and Social Research Council, United Kingdom
ETA	Estimated Time of Arrival
FM	Frequency Modulation
GoI	Government of India
GT	Gross Tonnage
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
I/B	Inbound
IMO	International Maritime Organisation
IMCO[6]	Inter-Governmental Maritime Consultative Organization
IMPA	International Maritime Pilots' Association
INS	Information Service
ISM Code	International Safety Management Code
ISPS Code	International Ship and Port Facility Security Code
MAIB	Marine Accident Investigation Branch, United Kingdom
MARPOL	International Convention for the Prevention of Pollution from Ships

[6] The IMO was known as IMCO till 1982. See Maritime Knowledge Centre at www.imo.org, (Harvey, 2012).

MCA	Maritime and Coastguard Agency, United Kingdom
MGN	Marine Guidance Notice
MSC	Maritime Safety Committee
MSN	Merchant Shipping Notice
NAS	Navigational Assistance Service
NM	Nautical Mile
OOW	Officer of the Watch
O/B	Outbound
O/S	Offshore
PSC	Port State Control
QBD	Queen's Bench Division
RO	Radio Officer
ROV	Remote Operated Vehicle
SAARC	South Asian Association for Regional Cooperation
SIRC	Seafarers International Research Centre
SOCSI	School of Social Sciences, Cardiff University, United Kingdom
SOLAS	International Convention for the Safety of Life at Sea
SREC	School Research Ethics Committee, Cardiff University, United Kingdom
STCW	International Convention on Standards of Training Certification and Watch keeping for Seafarers
SMCP	Standard Marine Communication Phrases
SMNV	Standard Marine Navigational Vocabulary
TOS	Traffic Organisation Service
TSS	Traffic Separation Scheme
UAE	United Arab Emirates
UK	United Kingdom
UNO	United Nations Organization
UNCTAD	United Nations Conference on Trade and Development
VHF	Very High Frequency
VTIS	Vessel Traffic Information Service
VTMS	Vessel Traffic Management System
VTS	Vessel Traffic Service
VTSO	Vessel Traffic Service Operator
WMU	World Maritime University

Key Definitions

AIS Automatic Identification System used on-board ships and in the VTS Decision Support System. AIS automatically transmits and receives information which allows ships to be identified, located, monitored and tracked. Amendments to Safety of Life at Sea (SOLAS) (IMO 1974), chapter V on ‘Safety of Navigation’, made it mandatory for vessels of 300 Gross Registered Tonnage (GRT) and above, engaged in international voyages and all passenger vessels to fit the AIS by 2004.

COLREGs Convention on the International Regulations for Preventing Collisions at Sea (IMO 1972). Also known as Collision Regulations and/or Rules of the Road.

Combination ladder The accommodation ladder rigged in combination with the pilot ladder to facilitate pilot boarding. This is a requirement for vessels with a freeboard greater than nine meters. A combination ladder reduces the length of the vertical climb for the pilot (see appendix 11, page 301).

CPA Closest Point of Approach; if it is shown to be zero by the radar and/or other equipment, an imminent threat of collision exists.

Draft/Draught The length in metres of the ship submerged below the water line. This is an important piece of information obtained from each vessel. The draught has a bearing on tidal port operations. Despite regular dredging to maintain channel depth, some large deep draft vessels may only be accommodated on the high tide.

Dredging Is usually undertaken in shallow waters. It is the excavation of the sediments from the seabed to ensure that the channel remains navigable at all times. The excavated sediments are then deposited in a designated zone.

Fairway The navigable channel in the port is also referred to as the fairway.

Freeboard The vertical distance in metres measured from the side of the ship, which is above the waterline up till the edge of the deck. The freeboard has a bearing on pilot boarding arrangements on-board ships. If a ship has a high freeboard (>9 metres) then the pilot ladder is required to be rigged in combination with the accommodation ladder. See the pilot boarding arrangements required by the International Maritime Pilots' Association (IMPA) in appendix 11, page 301.

Gangway The ship's ladder which facilitates embarkation and disembarkation.

Green to green Refers to how ships would pass each other. 'Green to green' implies that the ships would pass each other with the green starboard lights facing each other. In other words 'starboard to starboard'. In lay terms, the ships will pass with their right sides towards each other.

IMO A specialised agency of the United Nations Organization. It is the global standard-setting authority responsible for the safety and security of shipping and pollution prevention (see www.imo.org).

Lat-long The location coordinates in latitude-longitude format.

Lock gates Allow water to be stopped in a wet dock to maintain the level of water inside the dock despite the tidal variations.

Man ropes Rigged on either side of the pilot ladder to aid the pilot in climbing the vessel. See the pilot boarding arrangements required by the International Maritime Pilots' Association in appendix 11, page 301.

Port Refers to the left side in nautical parlance and also refers to the physical port facility.

Red to red Refers to how ships would pass each other. 'Red to red' implies that the ships would pass each other with the red port lights facing each other, in other words ‘port to port’. In lay terms, the ships will pass with their left sides towards each other.

SMCP IMO Standard Marine Communication Phrases (IMO 2002b) have been designed to overcome language barriers and promote communication along predictable lines at sea. The SMCP has eight message markers – *Question, Answer, Request, Intention, Instruction, Information, Advice* and *Warning*. Prefixing a message marker to an utterance aims to clarify the import of the message that follows.

SOLAS International Convention for the Safety of Life at Sea (IMO 1974). An important international treaty concerning the safety of merchant ships that has been ratified by 162 countries representing nearly 99% of the world’s tonnage, making it incumbent upon countries to legislate for the convention via national laws (for status of conventions, see IMO 2014).

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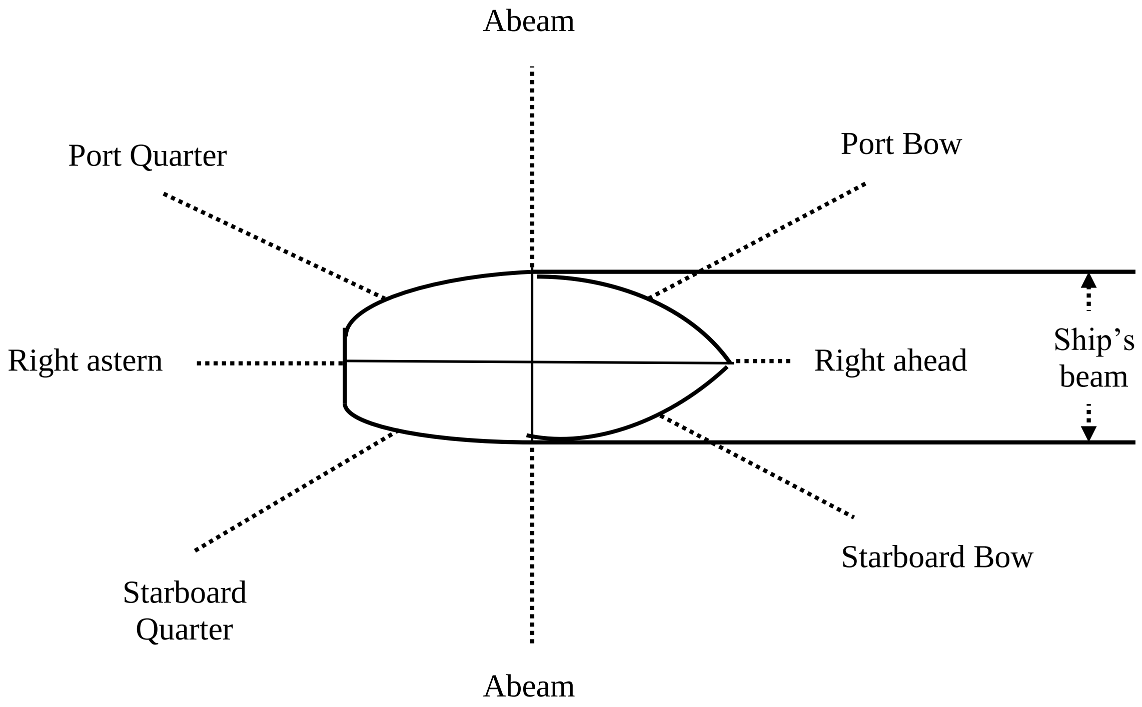
Starboard Refers to the right side in nautical parlance.

VTS Vessel Traffic Service (VTS) is a shore based service, established by the concerned competent authority, in waterways which are restricted, congested or pose navigational difficulties to vessels visiting or transiting the area, such as seaports, straits or channels.

VTS area A geographically delimited area serviced by the VTS which is officially declared by the authority. The VTS area may further be divided into sectors (IMO 1997b).

The Ship in Relation to its Surroundings

Figure 0. 1: The ship and its surroundings



Source: House (2014, p. 2)

Figure 0.1 helps in locating other vessels and Aids to Navigation (AtoNs) in the vicinity of a ship. The VTS operators, shipboard seafarers and harbour pilots use the terminology as they go about their daily work of achieving channel navigation.

Abstract

Shore based monitoring, communication, coordination and management of vessel traffic in ports worldwide is a *real world problem*. Informed by ethnomethodological studies of work, this thesis explores the ordered *in situ* work of Vessel Traffic Service Operators (VTSOs); the coordination of vessel traffic; the fine grained artful performance and achievement of safe fairway navigation and the challenges faced by the VTS operators in the daily accomplishment of their institutional role. An important source of data in this ethnographic study is the *naturally occurring interaction* on the main working Very High Frequency (VHF) radio channel of the port, which helps explore institutional *talk at work* deployed to facilitate interaction, negotiation and the accomplishment of safe navigation. Three additional research techniques are utilised for data generation – observations, semi structured interviews and unstructured interviews. The case of a major[7] Indian world port is utilised to explore the daily work of marine traffic coordination and the (pro)active interactional accomplishment of channel navigation.

Research takes place against the dynamic backdrop of the harbour – a complex space with a myriad of social actors populating the scene – the VTS operators atop their tower; shipboard seafarers negotiating restricted waters; pilots rendering pilotage services; Dock Master commanding the station; seafarers aboard small local craft and lively fishermen who at times pepper the marine radio with colourful language. Two categories of findings emerge – port interaction order, institutional talk and the contingent practices that accomplish the safety/time critical work and the technological, organisational and social constraints that shape, affect and inform the work of the VTS operators.

This study fills a gap in ethnomethodological studies of work with its focus on the VTS work site – a *centre of coordination*; it explores social order and contributes to the understanding of the local practical achievement of traffic coordination and channel navigation in restricted waters. It also contributes to our understanding of the constraints faced by the workers in the safety critical VTS work setting. Also discussed are the status of VTS operators and occupational hierarchy in the world port. The thick description of in situ VTS' work informs maritime safety, particularly relevant in safety critical, congested and restricted sea areas.

[7] The word 'major' is not used as an adjective, thirteen ports are classified as 'major' by the Indian government.

Chapter 1 Introduction

Merchant shipping forms the backbone of the global economy with nearly 90% of the international world trade being carried out by the sea (ICS 2013). There has been considerable growth in international seaborne trade over the latter half of the twentieth and the beginning of the twenty first centuries and the world fleet has consequentially expanded to meet the growing demand for shipping (UNCTAD 2014). The increasing volume of ocean going traffic poses concerns for navigation safety, particularly in restricted and congested waters such as near seaports, which pose navigational difficulties. Tens of thousands of vessels visit seaports[8] around the world and based on the directives from the concerned authority, marine traffic is monitored; and if required, this traffic is coordinated and managed, by the Vessel Traffic Service (VTS) in ports which have established this service[9]. The shore-based VTS is –

> A service implemented by a Competent Authority, designed to improve the *safety* and *efficiency* of the vessel traffic and to *protect the environment.* The service should have the *capability to interact with the traffic* and to *respond to traffic situations developing in the VTS area.*
>
> (Annex 1, Resolution A.857 (20) IMO 1997b, revokes A.578 (14), emphasis added)

The International Maritime Organization (IMO) is a specialised agency of the United Nations Organization (UNO) and is the authority responsible for setting global standards pertaining to *safety, security and environmental performance of international shipping*[10]. In 2012, Mr Koji Sekimizu, IMO Secretary-General, initiated the worldwide *Accident Zero* campaign of the VTS. At the IALA[11]-VTS symposium in Istanbul on 9 Sep 2012, the Secretary-General spoke of the campaign and exhorted VTS operators, pilots and mariners to work towards this objective and increase the number of consecutive accident-free days in the VTS (Sekimizu 2012).

Essential aspects of the IMO's (1997b, Annex 1, p. 3) current definition of the VTS (given above) are that it should be designed to improve safe and efficient movement of vessel traffic,

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[8] There are approximately 4764 seaports worldwide in 197 countries according to the World Port Source. Online at: www.worldportsource.com

[9] To date 171 VTSs have been entered by 32 territories in the World VTS Guide. This number is slated to be much higher as the guide requires voluntary contributions from competent authorities in different countries and countries such as India and Sweden have not entered their VTSs in the guide. Online at: www.worldvtsguide.org

[10] Online at: www.imo.org

[11] International Association of Marine Aids to Navigation and Lighthouse Authorities

protect the environment and *should have the capability to interact with the traffic and to respond to traffic situations developing in the VTS area*. Example 1.1, from my conference paper (Kataria and Praetorius 2014) highlights the requirements of the VTS to *interact* with traffic and *respond* to developing situations in the VTS area. It underscores the proactive endeavour of the VTS operator in ensuring incident-free waters. In this example, the VTS operator (VTSO) overhears two vessels (*Seva* and *NAM 123*) agreeing to pass 'port to port' and upon perceiving the development of a close quarters situation, asks the vessel *Seva* to pass 'green to green' instead and confirm the passing agreement with *NAM 123*.

Example 1.1: VTS monitoring and reacting to the inter-ship negotiation for passing

290. **Seva –** *NAM one two three, Seva*
291. **NAM 123 –** *Seva*, *NAM one two three*
292. **Seva –** Yeah *one two three*, we'll be passing red to red
293. **NAM 123 –** Okay passing red to red
294. **VTS –** Yeah but *Seva*, VTS, come in
295. **Seva –** VTS, *Seva*
296. **VTS –** Do you have that much time and space to go red to red?
297. **Seva –** Roger, roger
298. **VTS –** Anyway otherwise, keep clear of, why don't you keep green to green till you clear *NAM one two three*? Go to port, tell him, over.
299. **Seva –** Yeah okay *one two three, Seva*
300. **NAM 123 –** Yeah *Seva* copied, starboard to starboard, green to green
301. **Seva –** Roger green to green

The above example (1.1) highlights the empirical focus of the thesis, introduces the VTSO as a key protagonist (Goffman 1959) and ethnomethodological member (Garfinkel 1967, 2011 edition). It illustrates the *naturally occurring interaction* on the port radio that informs the thesis' narrative and identifies the in situ methods for achieving channel navigation (Garfinkel 1967, 2011 edition; Sacks 1992; Bryman 2001). The example emphasizes the monitoring role of the VTS, makes technology salient in the work of VTS, shows the inter-ship practice of negotiating passing situations on the Very High Frequency (VHF) radio (Bailey 2005; Bailey et al. 2008) utilising intention displays (Goffman 1971, 2010 edition) (see chapters 5 and 6) and highlights the intervention and instruction of the VTS operator to mitigate the risk of a close quarters situation.

This thesis is inspired and informed by ethnomethodological studies of work (Rawls 2008) and ethnographically explores the work of VTS operators; the coordination of marine traffic; the port interaction order; the performance and achievement of safe channel navigation and the challenges faced by VTS operators in the performance of their institutional role.

1.1 Introduction

The establishment of a VTS is an exercise in risk mitigation that supports the safe and efficient movement of vessel traffic and the protection of the environment. My research explores the in situ day-to-day work of the VTS operators in the Indian world port of MahaDevi[12] as they go about monitoring, interacting, negotiating and achieving/accomplishing safe navigation in the channel (see chapters 5 and 6) (Garfinkel 1967, 2011 edition, 2002, 2006).

The role, services and functions of the VTS are given in section 1.2 of this chapter. Its history and regulatory environment is given in section 1.3. Section 1.4 discusses exemplar case studies of accidents in VTS areas. It is highlighted that shore based coordination and management of marine traffic is a *real world problem* and research in the area has practical relevance (O'Leary 2005) for navigation safety in restricted and/or congested waters posing navigational difficulties. Section 1.5 discusses the aims of the thesis, the research questions, the structure of the thesis and how each of the chapters contribute towards the realisation of the thesis' objectives. Section 1.6 concludes the introductory chapter.

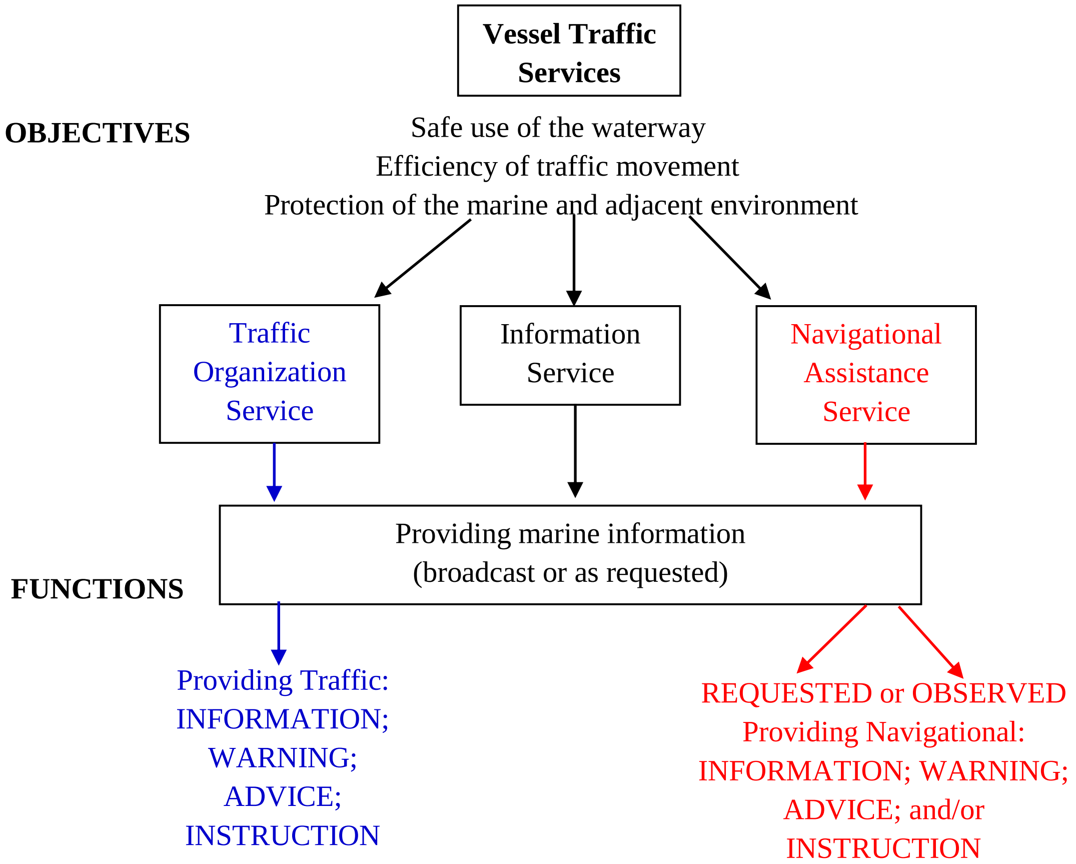
1.2 Vessel Traffic Service

The VTS is a shore based service, usually established in restricted waters and/or areas with high traffic density in the interest of maritime safety. The main aims of the VTS are to monitor, support and direct, safe and efficient vessel traffic movement as well as protection of the environment. The VTS operators monitor vessels in the VTS area with the help of a Decision Support System (DSS) (see figure 1.2, page 4) and talk to and interact with vessels and pilots to aid them to safely negotiate the congested and/or confined waters. The DSS for VTS operators combines hardware and software components which usually comprise information from equipment such as the radar and the Automatic Identification System (AIS) super imposed on electronic charts of the VTS area. The AIS automatically transmits and receives vessel information to enable ships to be identified, monitored and tracked. Ships entering or transiting a VTS managed area (channel/ fairway, port limits, coastal zone, harbour etc.) are usually

[12] Pseudonym for the port. MahaDevi in Hindi means the Great Goddess.

required to contact the VTS on the marine VHF radio. The VTS operators monitor the traffic situation in the entrusted geographical area on their screens and make seafarers and pilots aware of the local traffic situation and weather conditions as required. Within the VTS area there are certain reporting points, usually geographical way points, on approaching which, the vessel is required to contact the VTS. A VTS may provide one or more of the three services – INS (Information Service), TOS (Traffic Organization Service) and NAS (Navigational Assistance Service). In INS, pertinent information about the traffic situation, weather and hazards is provided to ships at intermittent intervals, when deemed necessary or when requested by ships. It is usually provided in a coastal VTS which vessels transit through. TOS requires forward planning as traffic is organised and instructed to move in a pre-determined order to avoid congestion. Pilots, tugs, berths and the entire time bound trajectory of the vessel requires prior planning. TOS is usually prevalent in port and/or harbour VTSs. NAS is provided when requested by a ship, usually when it is experiencing defects, deficiencies or navigational difficulties or when deemed necessary by the VTS in the interest of safety (IMO 1997b; IALA 2008, 2012). Figure 1.1 provides an overview of the VTS services and its functions.

Figure 1. 1: VTS overview of services and functions



Source: IALA (2012, p. 48)

Figure 1. 2: VTS operator at work with the help of the Decision Support System

Source: Student (picture taken and used with permission and appropriately anonymised)

1.3 History of the VTS

IALA (2008, 2012) provides a brief history of the development of the VTS. Developments in establishing shore based radar port control stations began after the Second World War to track ships and enhance port operations. The first such station was established in 1948 in Douglas, Isle of Man. followed by Liverpool in the same year, which was used to facilitate pilot boarding. In 1951 Radar and VHF were established in Long Beach, California to support port operations (Hughes 1998; Hughes 2009). Amsterdam established a shore based radar in 1952 and the whole port of Rotterdam had complete radar coverage by 1956 (IALA 2008, 2012). Le Havre port in France also established its own system and other ports soon followed. The commercial availability of radar technology enabled observing marine traffic from the shore in all weather and the establishment of shore based monitoring systems was a logical consequence (Hughes 2009). Today, the VTS systems are integrated information systems with inputs from diverse decision support equipment such as the radar, AIS, Electronic Chart Display and Information System (ECDIS), Closed-Circuit Television (CCTV) etc.

With respect to the IMO, the first mention of shore based services is made in 1968 in the Inter-Governmental Maritime Consultative Organization (IMCO)[13] resolution (1968) A.158 (ES.IV) in which they are referred to as *port advisory services* and it is considered that such *services*

[13] Former avatar of the IMO till 1982. See Maritime Knowledge Centre, www.imo.org (Harvey, 2012).

can make a valuable contribution to safety in harbour approaches. The IMO mentions the VTS for the first time in 1985 in resolution A.578 (14) on *Guidelines for vessel traffic services*. This resolution recognises that differing VTS procedures may cause confusion and offers harmonised internationally approved guidelines on VTS. The current resolution A.857 (20) *Guidelines for vessel traffic services* pertaining to the VTS was adopted in 1997. The structure of the IMO requires regulations to be legislated for and enforced via national regulation in member states. The inclusion of the VTS in the internationally ratified SOLAS convention, chapter V, *Safety of Navigation*, Regulation 12, gives VTS the required regulatory approval which can be enforced through national legislation of the member states (IMO 1974).

Prior to the inclusion in SOLAS, The IMO (1997) resolution A.857 (20, p. 2) –

> *Recommends* governments to *encourage* masters of ships navigating in areas for which vessel traffic services are provided to make use of such services (emphasis added)

With the inclusion of the VTS in SOLAS (Chapter V, 1974 as amended), the nation state can legislate, regulate and make participation in the VTS *mandatory* within territorial waters (also see UNO 1982).

Despite the establishment of a VTS, several accidents have taken place in designated VTS areas. Research in the VTS is topical given the magnitude of cost to life, property and the environment due to accidents in restricted waters. In the following section (1.4) I discuss five exemplar accidents in VTS areas to explore some of the *foreshadowed problems* of the study (Malinowski 1922, 2010 edition). The exemplar accident cases do not drive the thesis; they serve to introduce some of the themes encountered in vessel traffic monitoring, coordination and management. These case studies serve to make the case for the need for this research. The thesis has an ethnomethodological focus and is driven by observations, interviews and the real-time naturally occurring interaction on the port VHF radio.

1.4 Exemplar Cases of Accidents in a VTS Area

This section provides snapshots of exemplar accidents in VTS areas that caused irreparable losses. The examples depict a cross section of errors and introduce some of the themes which are further taken up and discussed in the empirical chapters (4, 5, 6 and 7).

1) ***Western Winner*** and tanker ***British Trent*** collided on 9 June 1993 with 9 fatalities in Zeebrugge. Among other identified causes of the accident, I highlight those pertaining to the VTS. *Western Winner* did not participate in the VTS, which resulted in the vessel not being positively identified and labelled in the VTS system. *Western Winner* did not give a thirty minute notice as required and did not report at the Kwintebank Buoy waypoint. It appears that its personnel were *unaware of the existence of the VTS* (MAIB 1995, p. 14). The Master of *Western Winner* was also unaware of the pilot boarding grounds and called for the pilot less than three minutes prior to the collision. He had made the call on VHF channel 69, while the pilot had to be contacted on VHF channel number 6.

> The pilot vessel, alerted by Zeebrugge Traffic Control, called *Western Winner* at 0542 hrs on VHF Channel 6 and asked for her position. No reply was given, but 36 seconds later cries of surprise from *Western Winner* were recorded by the shore-based VHF monitor (MAIB 1995, p. 7).

The investigation report mentions the VTS stating that it –

> did not monitor the traffic situation and did not give information about the developing dangerous situation when an unidentified relatively fast moving vessel entered a manoeuvring area in restricted visibility (MAIB 1995, p. 28).

To summarize, several pressing issues are raised by the accident in relation to the VTS. From the ship domain, they are – the lack of awareness of the existence of the service itself, non-participation in the VTS, missing reporting at waypoints/checkpoints and the non-selection of appropriate VHF radio channel for communication. For the VTS, it is the lack of proactively identifying, monitoring and reacting to a developing dangerous situation in the VTS area. These aspects are re-visited in empirical chapters 5 and 6.

2) Grounding of ***Maersk Kendal*** on Mongkok Sebarok reef in the Singapore Strait in 2009. A selection of the interaction between the Singapore VTS and the vessel prior to the grounding is presented below.

> **Excerpt 1 at 0703 hours**
> **VTS –** *Maersk Kendal*, require you to slow down, require you to slow down. Three ships coming out of the Jong channel (MAIB 2010, p. 5)

Excerpt 2 at 0710 hours in response to the VTIS' subsequent request to slow down
Master – Listen I am slowing down all the time. I have two ships out ahead and will pass astern of both of them, no problem
VTS – Chemical tanker, chemical tanker, the name is *Samho Jewelry*. *Samho Jewelry* is a, is a piloted tanker. She is not leaving Singapore. She is not leaving Singapore
C/O[14] **–** Got the name of the tanker – *Samho Jewelry*. Thank you.
VTS – Thank you, it appears that you are heading towards her. Over. (MAIB 2010, p. 6)

Excerpt 3 at 0713 hours
VTS – *Maersk Kendal*, shallow water ahead of you, shallow water ahead of you.
C/O – OK, sir. (MAIB 2010, p. 10)

The Chief Officer acknowledged that shallow water lay ahead and the vessel ran aground a couple of minutes later at a relatively high speed of 14.2 knots. The accident investigation report noted that the Master and the Chief Officer had *'become irritated by the VTIS interventions'* and were *'complacent in recognising the assistance VTS could provide'* (MAIB 2010, p. 30). While the errors made on-board the ship are beyond the scope of the thesis, I will revisit the aspect of misinterpreting information provided by the VTS and the choice of language and verbosity in the utterances of the Singapore VTSO in chapters 4, 5 and 6.

3) ***MSC Chitra*** and ***Khalijia III*** collision in 2010 in Mumbai, India. Outbound *MSC Chitra* had disembarked the pilot and was heading to sea when it collided with inbound *Khalijia III* (Constituent-committee 2011). Hundreds of containers from *MSC Chitra* tumbled overboard, some with dangerous cargo, and blocked the channel for several days adversely affecting port operations. Multi-party[15] communication on different VHF channels was identified as having led to a loss of situational awareness. Questions were raised about the training and certification of VTS operators, about reporting protocols between pilots and VTS operators and the cluttering of VHF radio channel by fishing vessels. These themes will be further explored in empirical chapters 4, 5 and 6 of the thesis.

4) ***MV Nordlake*** collided with ***INS Vindhyagiri*** in 2011, after which the Indian naval frigate caught fire and sank in Mumbai. A pilot was on-board *MV Nordlake* at the time of the

[14] C/O – Chief Officer. Appendix 12, page 302 lists speakers mentioned in thesis' excerpts in alphabetical order.
[15] VTS of two ports, pilots and seafarers

collision. The official report is pending, however a confusion between ships has been reported in the news and a former port official was quoted as saying –

> The Vessel Traffic Management System, which monitors the movement of all ships in the port, should have jumped in and sorted out the confusion. A lot of streamlining of traffic is needed on the Mumbai coast. MbPT[16] should try to strictly enforce lane discipline (Tiwary 2011).

This accident highlights communication as an issue in the VTS area. Since a pilot was on-board at the time of the accident, I also explore themes of the rank, status, hierarchy and the perceptions of the VTS operators regarding the pilots in chapter 7 on the micropolitics of port communication (see Brodje et al. 2013).

5) Collision of ***MV Karen Danielsen*** with the Great Belt West Bridge, Denmark with one fatality (DMA 2005) – the vessel did not alter course to pass south of the bridge but continued to sail towards it on a collision course. The VTS was in no doubt about the identity of the vessel at any point in time and knew that it was too big to pass under the bridge. However, the VTS overlooked to monitor the vessel closely and did not realise that it had not altered its course and was on a collision course with the bridge. The VTS did not call to contact the ship at any point. The Chief Officer on watch keeping duty had most probably fallen asleep. He was the only one to lose his life and had a high concentration of alcohol in his blood. The VTSO on duty stated that he was distracted by administrative work and the display colours on the screen had not been changed by him according to his preference at the time of the accident. The accident investigation report noted that prevention of collision was unlikely even if the VTS had called the vessel after it missed altering course at the waypoint, as by then it would have been too late to avert the accident. Recommendations were made to call ships ten minutes before they reached the turning point to confirm intentions (DMA 2005, p. 46). With respect to the VTS, this accident highlights the burden of administrative work, complacency, lack of monitoring, lack of interacting with traffic and a lack of reacting to developing situations. The accident also highlights technological issues that concern VTS operators (customisation of screen display in this instance).

[16] Mumbai Port Trust

Prominent examples of accidents in VTS areas were discussed in this section to justify the need for the research and the topical relevance of the study in the high risk, safety critical VTS work setting. The examples of accidents shared above are not representative and were selected to cover diverse themes in accidents in VTS areas, highlight the work of VTSOs and some of the challenges faced by them in their work. The themes identified are subsequently discussed with the thesis' findings in the empirical chapters 4, 5, 6 and 7.

1.5 Aims, Substance and Structure of the Thesis

This section discusses the aims of the thesis, the research questions, structure of the thesis and how each chapter contributes towards the realisation of the thesis' objectives. This thesis is about the accomplishment of work by VTS operators – the coordination and management of vessel traffic, as well as the challenges faced by them in the institutional performance of work. The thesis also explores the port interaction order.

The Introduction chapter introduces the role of VTS in shipping, its services and functions, history and regulatory environment. The chapter also introduces some of the themes identified from accidents in VTS areas as some of the *foreshadowed problems* (Malinowski 1922, 2010 edition). The current section (1.5) presents the aims of the thesis crystallised into research questions arrived at after a comprehensive review of literature (chapter 2). The research questions pertaining to the work of VTS operators, the interaction order and the challenges faced by them in the performance and accomplishment of their work are given below –

- What is the work of VTS operators?
- How do they work?
    - How is vessel traffic managed?
        - What are the practices, procedures and activities that facilitate vessel traffic management?
    - How is harbour / channel navigation achieved interactionally?
        - What is said, when, to whom, why, how[17] and to what effect in furtherance of the communicative management and accomplishment of harbour/channel navigation?

[17] In order to nuance how something is said, I utilise conversation analysis where required.

- What are the challenges, if any, in the work of VTS operators?

This thesis is divided into eight chapters and the structure of the thesis facilitates the exploration of answers to the identified research questions and the realisation of the thesis' vision.

Chapter 1 is the introductory chapter that introduces the VTS as a shore side service provided to improve the safe and efficient movement of vessel traffic in confined waters. It introduces the different type of services provided by the VTS. The chapter traces briefly the history of the VTS from simple radar-based systems after the Second World War in the late 1940s (IALA 2012) to the advanced decision support systems of today comprising shore based radars, AIS, ECDIS, CCTV, VHF etc. The chapter locates the VTS in the current regulatory environment that comes down from the IMO, is legislated for by the nation state and operationalised on the ground by the National Competent Authority and the local VTS authority (IMO 1997b). The chapter explores exemplar cases of accidents in VTS areas to identify some of the emergent themes. This chapter introduces the *real world problem* of research in the topical VTS domain (O'Leary 2005). The chapter introduces the aims of the thesis and how each chapter contributes to them, thereby presenting a cohesive overview of the thesis.

Chapter 2 on the literature review explores the academic landscape with respect to pertinent studies in ethnomethodological studies of work, shipping, VTS and the ATC. The chapter also reviews research projects on the IMO's (2009) e-Navigation initiative which involves the VTS and exchange of information between the ship and Shore. The gaps in the literature are identified and my unique contribution to knowledge is made salient in chapter 2 by positioning my research alongside and with respect to other studies in the area. Chapter 2 takes my problem definition further, embeds it in academic and industry literature and builds a case for undertaking an ethnomethodologically informed ethnographic study in the port VTS.

Chapter 3 is on research methods. My study is an ethnographic study that draws upon ethnomethodology, interactionism and related ideas to explore the work of VTS operators and the challenges faced by them in their work. Chapter 3 presents the planning for the research which went through the refining stages of three initial site visits to ports in the UK, followed by a pilot study in an Indian port before moving on to the main research field work site in India. The chapter also presents the embodied reflexive experiences of conducting research fieldwork in India. The chapter discusses the four data generation techniques utilised in the research –

audio recording of naturally occurring interaction on the main working radio channel of the port, observations, semi structured qualitative interviews and unstructured interviews. Engagement with the data in terms of transcribing, coding, transliterating, translating and working with it are also discussed. Research ethics and the steps I took to guard my personal safety are also discussed in the chapter.

Chapters 4, 5, 6 and 7 are the four empirical chapters. Chapter 4, on the Harbourscapes, is the first of the findings chapters which introduces the MahaDevi harbour as the dynamic backdrop against/in which the VTS operations take place (Schutz 1967; Husserl 1970). This chapter identifies and locates the main social actors in the scene, identifies the relationships between them and introduces what is being said to whom and to what effect. The chapter explores the work of the VTS operators, their training and certification and the challenges they face in their work. This chapter introduces the cacophonic bedlam of the marine radio which has implications for safety and time critical work. The port working channel has institutional talk interspersed with foul language, live singing, playing recorded music, light banter and even airing unique mobile phone ring tones. It is a complex space and this chapter captures the complexity of the environment in which work is accomplished (see Atkinson et al. 2008).

Chapters 5 and 6 have a similar focus of exploring empirical practices that achieve channel navigation. The main focus of chapter 5 is to explore and nuance the routine in situ practices that accomplish institutional work in MahaDevi port VTS, while the focus of chapter 6 is the communicative management and coordination of traffic between two neighbouring ports. Chapter 5 explores the accomplishment of marine traffic management and the fine-grained communicative practices to coordinate traffic in the MahaDevi harbour and fairway. It explores vessel trajectories in the harbour, the associated key communicative stages as well as nuances the interaction between different participants at different communicative stages of a vessel's journey. Due to the similarity in focus of chapters 5 and 6, no conclusion is provided at the end of chapter 5 but a comprehensive conclusion is provided at the end of chapter 6 that summarises the findings from both these chapters. Chapter 6 explores the trajectories of vessels moving between two neighbouring ports to explore the in situ methods of coordinating traffic between the two ports. These two chapters can be considered to put forth sanitised data by virtue of the fact that only institutional interaction (Drew and Heritage 1992; Schegloff 1992) that facilitates work for the port is presented in these two chapters, however chapter 4 that precedes these two empirical chapters (5 and 6) and chapter 7 that follows, re-iterate the presence of chaos in the ethnographic study of the complex field site (Atkinson et al. 2008), while these two chapters (5 and 6) can be said to demonstrate the method in the madness.

Chapter 7 on the micro-politics of port communication, explores the undercurrents of rank, status, power, hierarchy and asymmetry as performed on the port radio (Goffman 1959). This chapter presents a social and organisational challenge inherent in the work of VTS operators. The asymmetry is identified as a theme in chapter 4 but taken up in detail in chapter 7 as it is a significant challenge to the work of VTS operators (Foucault 1995b; Hutchby 1996a).

Chapters 4 and 7 are closer in thematic focus as they present the chaos and the messiness of the complex field site and reveal the challenges faced by the VTS operators, while chapters 5 and 6 cut through the clutter and reveal the in situ practices that get the traffic moving safely and efficiently each day (Garfinkel 2002, 2006). Taken together the four empirical chapters answer the research questions of the thesis which pertain to the ordered accomplishment of conducting traffic in the port and the challenges faced by the VTS operators in the performance of their institutional work. The empirical chapters also discuss the port interaction order.

Chapter 8 is the conclusions chapter. It explicitly identifies the original contributions of the study to sociology and the maritime transportation sector. It presents the key findings of the study – the practices of VTS operators that facilitate the performance of their institutional work and the social, organisational and technological challenges faced by them in their work. A methodological decision was taken to reflexively and comprehensively engage with the findings as they appeared in the empirical chapters and hence no separate chapter of discussion of results is presented to avoid redundancy. In the conclusions chapter, I also engage with the limitations of my study as well as provide suggestions for future research in the area.

1.6 Conclusion

The introduction chapter justifies the need for the research and highlights the topical nature of the study. The structure of the thesis is supportive of the research vision and connects the topic to the gap in literature (see chapter 2 on literature review). This study is an exploration of the in situ work of VTS operators, inspired by ethnomethodological workplace studies, ethnomethodology, interactionism and related ideas. It nuances ship-shore communication in the VTS work setting and can inform maritime safety. Chapter 2, a review of related literature follows, that helps me position my research in the academic landscape.

Chapter 2 A Review of Related Literature

The aims of the thesis, the topical nature of the research and some of the themes as *foreshadowed problems* (Malinowski 1922, 2010 edition) were introduced in chapter 1; while chapter 2 critically reviews related literature and helps formulate the research questions guiding the study. This Chapter identifies the gaps in the literature and positions the research with respect to other studies in the pertinent areas and highlights its unique contribution to knowledge in the discipline of sociology as well as the maritime sector. This study is informed by ethnomethodological studies of work (Garfinkel 1967, 2011 edition; Rawls 2008); it draws upon ethnomethodology, interactionism and related ideas and is embedded in qualitative research conducted at the Cardiff School of Social Sciences (Atkinson and Housley 2003; Hammersley and Atkinson 2007; Atkinson et al. 2008) and the research conducted on the Human Element in shipping at the Seafarers International Research Centre (SIRC), Cardiff University (Sampson and Thomas 2003; Alderton et al. 2004; Bailey 2005; Bailey et al. 2006; 2008; Sampson 2013).

2.1 Introduction

An eclectic approach to sociological theory is adopted in this thesis, necessitated by the research interests to explore the in situ ordering of marine traffic and the accomplishment of safe harbour/channel navigation and the interaction order while retaining the broad scope of analysis. Such an approach allows for the exploration of the interaction order without being restricted to a narrow perspective such as that offered by conversation analysis. The literature review justifies this eclectic approach by grounding it in the existing literature. To this end, the discussion is grounded in both, methodological literature as well as substantive literature related to my areas of interest – studies of work not only related to conversation analysis but also ethnomethodology and interactionism.

Ethnomethodology and its distinctive contribution to the discipline of sociology and the interaction order is discussed in section 2.2; literature on ethnomethodological studies of work is critically reviewed in section 2.3 along with studies of institutional talk in *centres of coordination*, in particular. Section 2.4 reviews literature on the ATC while section 2.5 reviews literature on the VTS. This enables a comparison of the available body of work on VTS operators and ATC controllers in the shipping and aviation transport modes respectively. Section 2.6 reviews pertinent ethnographic and/or ethnomethodological studies in shipping, section 2.7 justifies my choice of an ethnomethodologically informed ethnographic study of work that draws upon interactionism and related ideas and section 2.8 concludes the chapter.

2.2 Ethnomethodology and the Interaction Order Sui Generis

This section discusses ethnomethodology and its concurrences and divergences with select theoretical perspectives; highlights ethnomethodology's contribution to sociology and discusses Goffman's (1967; 1983) interaction order and its articulation by Rawls (1987).

2.2.1 Ethnomethodology

'Ethnomethodology', was founded by Garfinkel and in his own words, he utilised the term –

> "…to refer to the investigation of the rational properties of indexical expressions and other practical actions as contingent ongoing accomplishments of organised artful practices of everyday life" (Garfinkel 1967, 2011 edition, p. 11).

Ethnomethodology explores how members of the society on a daily basis establish a taken for granted common sense view of the world. The terminology literally refers to members' methods (ethno methods) which *are* the focal point – the sociological object of the research approach; and not the individual person, the collective or aggregate approximations (Rawls 1989a; Rawls 2008). Ethnomethodology studies how participants of a society construct and preserve their social orders by investigating the taken for granted, *seen but unnoticed*[18] (Garfinkel 1967, 2011 edition, p. 36) facets of everyday sense making.

Indexicality and *reflexivity* are two of the terms coined within ethnomethodology. Indexicality implies the context dependent nature of meaning making; members make sense of shared expressions, actions, gestures etc. following the references to the context in which they occur and ethnomethodology's objective is to study how orders are created in a reflexive manner by members in their daily lives. Reflexivity features in the enduring witnessable order; the response of the listener reflects back on the previous speaker to show it in the light that it has been understood. Reflexivity therefore is a *witnessable social object* and not reflection within *individual consciousness* (Garfinkel 2006, p. 34). In ethnomethodology, the primary motivation

[18] The italicised text in the chapter is firstly used to indicate verbatim text from a publication, wherein a page number is provided in the in-text citation, and secondly it is utilised to highlight a point of interest for me in the thesis which I draw upon in my study.

for a competent member is the sustenance of mutual intelligibility through the use of shared situated members' methods (Rawls 2008). Garfinkel (2006, p. 99) advocates the study of the *communicative effort* of situated actors and their situated actions/practices that produce mutually intelligible meaningful immortal order. According to Garfinkel, the situated, endogenous details of order production and mutually intelligible sense making are adequately explained by the need for members to mutually orient and produce order, utilising shared methods for each next first time/occasion (Garfinkel 2006; Rawls 2008).

Ethnomethodology finds the concreteness of social facts in empirical witnessable order while hitherto social facts had been treated by sociologists as *theoretical or conceptual constructions* (Rawls A W in Garfinkel 2002, p. 2). For Garfinkel, *social facts are orderly endogenous products of local orders* that help accomplish *immortal ordinary society* Garfinkel (2002, p. 65). In *The Rules of Sociological Method* Durkheim (1982) articulated his aphorism to treat *social facts as things* and Garfinkel (2002) regards ethnomethodological studies and its results as a fulfilment of the self-same aphorism.

Durkheim's *treatment of practice* is explored by Rawls (2001, p. 33) particularly with respect to *The Elementary Forms of Religious Life* (Durkheim 1915 cited in Rawls 2001). She argues that Durkheim has emphasised concrete witnessable practices over beliefs and representations; further arguing that in Durkheim's view, *the collective experience of concrete sounds and movements* was *a prerequisite for the subsequent development of representations* (ibid., p. 33) and served as a *foundation for beliefs* (ibid., p. 63). Rawls notes that most 20th century sociology has substituted beliefs for practices and refers to it as the *fallacy of misplaced abstraction* (ibid., p. 62). She argues that beliefs are elusive, while practices lend themselves to detailed empirical examination as they are *concrete and witnessable*. She adds that relativism threatens a *sociology of interpretation and belief* which a *sociology founded on the study of concrete witnessable practices,* seeks to avoid (ibid., p. 63).

For Garfinkel, a social setting –

> *'organises its activities to make its properties as an organised environment of practical activities detectable, countable, recordable, reportable, tell-a-story-aboutable, in short accountable'* (Garfinkel 1967, 2011 edition, p.33).

Ethnomethodology eschews theorizing, is data driven and analytically inductive (Heritage 1984; Silverman 1985; Ten-Have 1999). Maynard and Clayman (1991, p. 387) state that ethnomethodology's *theoretical proposal is that there is a self-generating order in concrete activities*. Contextual sense making is a part of in situ actions and ethnomethodology advocates the study of social actions from within (Button 1991; Hester and Eglin 1997). For Garfinkel, in situ meaning making and the accomplishment of order is an epistemological question and ethnomethodology seeks to empirically study it in-depth. The distinctive contribution of ethnomethodology to sociology is aptly summed up by Rawls (2008, p. 703) –

> The argument that meaning requires order, and the empirical elaboration of how this is achieved through sequential devices and reflexive attention, are Garfinkel's unique contribution to social theory.

Around the time of the emergence of *Studies in Ethnomethodology* (Garfinkel 1967, 2011 edition), the discipline of sociology faced upheaval and the influence of structural functionalism of Garfinkel's PhD supervisor at Harvard, Talcott Parsons was on the decline (Heritage 1987). Garfinkel departed radically and fundamentally from Parsonian Structural Functionalism (Parsons 1949, 2nd edition), which in essence was a theory of *motivation of action* which according to Garfinkel regarded the social actor as a *judgemental dope* and a *container of motivations* with internalised, socialised norms and values through institutionalisation (Garfinkel 1967, 2011 edition). Garfinkel's Ethnomethodology seemed radical and itself faced severe criticism and drew extreme and negative reactions from some quarters (see Attewell 1974).

In this sub-section, I discussed ethnomethodology and its unique contribution to sociology, in the following, I discuss the similarities between ethnomethodology and select theoretical perspectives, their concurrences and divergences.

2.2.2 Ethnomethodology and Select Theoretical Perspectives

In this sub-section, I briefly discuss the parallels between select perspectives with ethnomethodology, in particular – pragmatism, conversation analysis, symbolic interactionism and phenomenology. This discussion highlights the common roots of the perspectives and serves to justify and ground the eclectic theoretical approach adopted in the thesis.

There are thematic continuities between ethnomethodology and pragmatism in philosophy; they converge with respect to three essential themes highlighted by Emirbayer and Maynard (2011) – privileging social life as lived and experienced, in sociological inquiry; focussing on in situ creative problem solving – the *shop floor problem* (Garfinkel 2002, p. 108-112); and thirdly with respect to language as a topic in both pragmatism and ethnomethodology.

> Ethnomethodology and conversation analysis are cognate with pragmatism insofar as they are concerned with understanding utterances both as context dependent in a local and temporally developing sense and as a site for social action and interaction – and intent on analysing them in a way that captures their pragmatically cooperative (or, in ethnomethodological terms, collaborative or co-produced) character (Emirbayer and Maynard 2011, p. 256).

With respect to the three themes mentioned above, Emirbayer and Maynard (2011) demonstrate the empirical development of the pragmatic impulse and spirit in ethnomethodological studies of work and conversation analysis that surpasses the vision of the early American pragmatists – Dewey, Pierce, James and Mead in *developing the larger implications and promise of those themes* (also see Clayman and Maynard 1995; Emirbayer and Maynard 2011, p. 221).

The roots of symbolic interactionism can also be traced to the pragmatism of James, Dewey, Pierce and Mead (Denzin 2004) and the development of the qualitative field research at the University of Chicago (Atkinson and Housley 2003). The phrase 'symbolic interactionism', points to the underlying linguistic symbols and emphasises the interactive aspect in human interaction.

> …people do not act toward one another, but interact with each other.
>
> (Denzin 2004, p. 83-84)

The three assumptions that form the basis of symbolic interactionism are described by Blumer (1969, p. 2-6) as follows –

1) Human beings act towards things on the basis of the meanings which these things have for them.
2) The meaning of things is derived from, or arises out of, or is formed in the context of social interaction between people.
3) Meanings are used, handled and transformed through, an interpretive process by the person during action.

> The symbolic interactionist approach rests upon the premise that human action takes place always in a situation that confronts the actor and that the actor acts on the basis of *defining this situation* that confronts him (Blumer 1997, p. 4).

Symbolic interactionism and ethnomethodology have common shared strands that both are sceptical of theorising, prefer qualitative research methods for exploration, particularly ethnography and both reject the notion of objective description. However, there are tensions between these two sociological perspectives. Dennis (2011) differentiates the two perspectives by illustrating their differential approach to interaction by evaluating the concepts of *actor*, *context* and *meaning* utilising *Garfinkel's notion of the plenum*. While ethnomethodology and interactionism agree that meaning is produced in social interaction, interactionists study the meaning/interpretations made and ethnomethodologists *emphasize the ways in which meaning is produced, recognised and transformed during an interaction* (Dennis, 2011, p. 351). In ethnomethodology, a social actor is a *member* and it studies interactional processes, ignoring the individual *point of view as sociologically irrelevant* (Dennis, 2011, p. 351), while the social actor occupies the central pride of place in symbolic interactionism. Symbolic interactionism regards the concept of context as *particular interactions as taking place in particular contexts* (Dennis, 2011, p. 352), whereas ethnomethodology treats context as an interactional accomplishment by making salient how the context is invoked and made relevant in situ by the interacting participants.

Wallace asserts that ethnomethodology is clearly interactionist insofar as it embraces a theoretic viewpoint rather than a methodologic one (Wallace 1969). Maynard and Clayman (2003) expound the correspondences between symbolic interactionism, conversational analysis and ethnomethodology. The congruence between the three is essentially derived from the need to study life in situ from the perspective of the members. Similar to symbolic interactionism, meaning, language and interaction occupy pride of place in ethnomethodology and conversation analysis. Maynard and Clayman (2003, p. 174) profess that ethnomethodology and conversation *analysis "can be seen as subjecting some of the most compelling aspects of Median social psychology to empirical analysis"*.

The phenomenology of Schutz was invoked by Garfinkel in ethnomethodology; while Schutz's focus is on projects and the conceptual organisation of perception and interpretation; for Garfinkel, the society's members are embodied, engaged and interactive; action is reflexive and identities are situated in the phenomenal field (Rawls, A. in Garfinkel 2006, p. 19). For the relation of ethnomethodology to phenomenology, see Psathas (1968); Anderson et al. (1985). Schutz (1967; 1973, 4th edition) combined and applied the phenomenological philosophy of Husserl (1970) with Weberian (1949) verstehen interpretive sociology and ideal types to the mundane social life-world and Garfinkel owed some of his inspiration for ethnomethodology to Schutz (see Psathas 2004).

Goffman's *interaction order* exploring the analysability of interaction (see Drew and Wootton 1988 (2003 edition)) and Garfinkel's intersubjective reflexivity (1967, 2011 edition) have contributed to Conversation Analysis (Heritage 1998) founded by Harvey Sacks (1989, 1992). While examining the transcripts and tapes of calls made by suicidal persons to a suicide prevention centre, it occurred to him that there might be a method adopted by the callers to prevent giving their name, even when the staff member at a suicide prevention centre had already provided theirs. This was the beginning of conversation analysis which studies the *sequential order of interaction, adjacency pairs, turn taking, sequences, speech exchange systems*, *membership categories* and the ilk in fine grained detail (see Atkinson and Heritage 1984; Schegloff 1988, 2003 edition; Boden and Zimmerman 1991, 2003 edition; Ten-Have and Psathas 1995; Hester and Eglin 1997; Schegloff 2007).

The diversity of ethnomethodology is reviewed by Maynard and Clayman (1991). The authors discuss the diversity of the subfields of ethnomethodology; they address *theory*, *phenomenology, cognition, conversation analysis, research in institutional settings*, *studies of science and applied research* (ibid., p. 385). The authors highlight the diversity in ethnomethodology with respect to theory, method and area of focus. The increasing diversity among researchers undertaking research in the ethnomethodological vein has been noted elsewhere (see Zimmerman 1978). Atkinson (1998) notes that ethnomethodology is not homogeneous and critiques empiricist conversation analysis in particular. Maynard and Clayman (1991) articulate and describe the range and variety of subfields within ethnomethodology and clarify the shared assumptions of the subfields along with the distinctions between them.

The concurrences between the perspectives discussed in this section serve to ground the justification of the epistemology of the study discussed further in section 2.7. The following section discusses the interaction order as articulated by Rawls (1987) based on Goffman (1967; 1983) and its convergence with the work of Garfinkel and Sacks.

2.2.3 The Interaction Order Sui Generis

Rawls (1987) notes that Goffman did not put forth a clearly articulated systematic theory of the *interaction order* which she highlights as his contribution to social theory – *the interaction order sui generis*. It is a unique order of the social interactive self, independent of individuals or structures; a separate domain to be studied in its own right (Goffman 1967; Goffman 1983). She states that Garfinkel's ethnomethodological in situ local order production is in many respects similar to Goffman's interaction order and explicitly addresses the relationship of the order to formal rules and constraints. She argues that it is theoretically inadequate to study and understand the interactionist work of Goffman from within the dichotomy between agency and social structure as he considers the individual and the structure as products of the interaction order. Not only is the interaction order constitutive of self, but also places demands upon the social structure and thus provides a way to attempt to theoretically resolve the dichotomy between the individual and structure. The order is derived not by the social structure but by the needs of the presentational self which imposes constraints on the interaction order and also provides the intrinsic motivation required for compliance. Meaning of actions is generated by a commitment to the production of order and this commitment is moral and sacred for the social actor.

Giddens (1984) proposed the *double structuration* theory to bridge the gap between agency and social structure wherein social structure is created and reproduced by formal organisations as well as mundane interactions through aggregations and routinisation. Goffman on the other hand denies the existence of such a dichotomy and does not begin with agents or structures but with *those settings, commitments and understandings which allow agents and social structures to have a social presence in the first place* (Rawls 1987, p. 139). Rawls (1987) states that before a systematic theory of the interaction order can be elucidated, a position on language compatible with Goffman's interaction order needs to be articulated and she identifies the existence of such a position in the works of Sacks and Schegloff. She further adds that the theory of the interaction order would require the articulation of the adequate explanation for institutional constraint which she identifies in the works of Garfinkel and Sacks.

Rawls (1989b) builds upon *local order production* in the works of Garfinkel, Goffman and Sacks; she reformulates the work of Goffman and Sacks, in particular, to propose that it is useful to study social order as constituted by *two distinct forms of order* (ibid, p. 147) – one, constitutive and the other, institutional, which requires accountability and is rule-governed. She utilises ethnomethodology and conversation analysis to critique the traditional assumptions of order, meaning and the dichotomy between the individual and structure. She puts forth a theory of social order in which institutional frameworks do not order locally produced orders, but serve to constrain them. And meaning, self and institutional order are achieved interactionally through local orders. She argues that interaction is *organised in its own right* and should not be seen to lead to routinisation and subsequent institutionalisation. She notes that sociologists have looked at order at the individual as well as the social level, but they regard the individual as constrained by the social structure while at the same time serving to reproduce the structure (see Giddens, 1984). Goffman's conception of the interaction order is based upon the constraints imposed by the needs of the self and Garfinkel and Sacks propose the idea that mutual intelligibility imposes constraints upon interaction. Goffman has largely focused on the self, while Sacks on talk, and the elucidation of order at the level of talk is compatible with Goffman's work on the interaction order. For Goffman, the interaction order transcends situations; is extra situational, as order is constituted by the requirements of the self and not the situation per se.

> The notion of accountability in Sacks and Garfinkel, and the distinction between composite and constructive devices in Sacks' earlier work (Sacks, 1964-65), provide a suggestion as to how the distinction between an interaction order and institutional order with respect to the needs of self can be carried out to the necessary level of detail in language (Rawls, 1989b, p. 159).

In Goffman's interaction order, the social self poses constraints while in Sacks' work, *the need for a sequential order poses constraints on the need for commitment to the conversation* (Rawls 1989b, p. 162). The constitutive level of meaning is provided by the sequential order and sequence relevancies are inherently moral. Rawls (1989b) notes that Sacks' composite devices are utilised at the level of accounts; the meaning of which is less dependent on the sequential order and these performative speech acts allow for manipulating the conversation strategically. The meaning of composites is available to the interactants through *vocabularies of motive* or a shared culture and a*ccounts, accountability and conditions and justification belong to particular social orders* (ibid, p. 166). Drawing upon the work of Goffman, Sacks and Garfinkel, Rawls proposes an interaction order which is self-organising in nature and avoids the sociological problem of order at the individual as well as the structural level as these are products of the interaction order, instead of separate entities to be bridged. She proposes an interaction order in which self, meaning and practical action are all products of interactional commitment (also see Rawls 2009). Rawls' (1987) theoretical approach to the interaction order helps examine local order production in which members' interactional commitment informs the emergence of the social self; highlights the intelligibility, indexicality and reflexivity of meaning and the accountability of social action.

My research aims to explore the in situ work of VTS operators. Ethnomethodology's programme of workplace studies and Rawls' (1989b) elucidation of the interaction order are compatible with the research interest that seeks to explore the in situ ordering of marine traffic in a port.

Institutional talk on the marine radio features prominently in my research and the following sub-section takes note of the body of research on institutional talk.

2.2.4 Ethnomethodology, Conversation Analysis and Studies of Institutional Talk

In this section, I highlight studies on institutional talk inspired by ethnomethodology and conversation analysis.

Several studies have combined ethnomethodology and conversation analysis to study institutional talk in different settings – in the airline cockpit (Nevile 2004; 2006, 2007), in the London underground control centre (Heath and Luff 1992), in medical settings (Psathas 1990b; Maynard 1991; Ten-Have 1991; Heath 1992; Maynard 1992; Atkinson 1999), in law courts (Atkinson 1992; Drew 1992; Komter 1995), emergency services calls (Whalen and Zimmerman 1990; Zimmerman 1992; Whalen 1995), news interviews (Clayman 1988; Heritage 1991; Clayman 1992; Greatbatch 1992; Clayman 1993) etc. The studies of institutional interaction have highlighted the difference between ordinary conversation and institutional interaction in sequential organisation and knowledge asymmetries, among others. These studies highlight the interactional accomplishment of institutional identities and institutional work. They examine institutional knowledge deployed in the pursuance of institutional goals in the different work settings.

There is an extensive body of literature on institutional talk utilising conversation analysis in different institutional settings. This study is not a study of institutional talk, but a study of work embedded in ethnomethodology's programme of workplace studies. It studies the work of VTS operators which is in part being accomplished in, and through talk, both of an institutional and non-institutional nature (see Schegloff 1992).

Psathas (1995b) has explored the debates between ethnomethodological researchers and those undertaking conversational analysis regarding social structure and whether and how it should be addressed by conversation analysts. Furthermore, he discussed whether work and its organisation as developed within 'studies of work' by ethnomethodologists can be addressed by conversation analysis. With the examples of five categories of conversation analytic studies he argues that ethnomethodological and conversation analysis are complementary in research focus on in situ order. The body of work which discusses social structure in conversation analysis is "studies of talk and social structure". Psathas (ibid) states that social structure is not the focus in studies of work, while it is a key concern in "studies of talk and social structure" which explore among others, the membership categories pertinent to participants, the relevance of interaction and procedural consequentiality of context in talk in interaction (Schegloff 1991; also see Boden and Zimmerman 1991, 2003 edition). The study categories four and five, as delineated by Psathas (1995b, pp 151-152) are pertinent to this thesis as they outline a position of conversation analysis complementary to studies of work. The fourth category of studies is –

> The study of work as it is carried out/accomplished by the parties/incumbents of particular oriented to categories within and as parties of a describable /referable/ locatable set of practices which may be identifiable as an "organisation", "unit", "company", "bureaucracy", or what have you.
>
> Note here that "work" is not limited to talk-in-interaction but may include a variety of interactional phenomena. If talk is examined, it is for the examination of how work is accomplished rather than for the discovery of the structures of talk (Psathas 1995b, pp. 151).

In study category five, the researcher is engaged in the study of work in discovering the haecceities of work, which can be accomplished *in, and through talk*; however the researcher is not engaged *in the discovery/description/analysis of the general structures of interaction* per se (Psathas 1995b, pp. 152).

Of the study categories delineated by Psathas (1995b), categories four and five recapitulated above, are apt for this study as it is an exploration of in situ work in a worksite which can be classified as a *centre of coordination* (Suchman 1993); and even though the study will utilise the audio recordings of the VHF radio interaction between VTS operators and other entities as one of the main data sources, the interaction will be explored and analysed to reveal the haecceities of work in line with the main research interest and not the structure of talk.

In this section, I identified studies of institutional talk in diverse settings and also identified a research study position/category compatible between ethnomethodological workplace studies and conversation analysis in Psathas (1995b). The following section explores ethnomethodological studies of work which provide the theoretical background of the thesis; it includes studies of mediated communication and studies in which institutional talk/talk in institutional settings is explored, particularly in centres of coordination (Suchman, 1993).

2.3 Ethnomethodological Studies of Work

This section discusses ethnomethodological workplace studies – the origins of these naturalistic studies; the analysability of work and technology afforded by these studies; the situatedness, embeddedness and contingent nature of work; and the context dependent and emergent nature of rules in work.

2.3.1 Origins of Ethnomethodological Studies of Work

Heath et al. (2000) note that workplace studies have largely emerged within disciplines such as Human Computer Interaction (HCI), Artificial Intelligence (AI) and feature in disciplines such as Computer Supported Cooperative Work (CSCW), especially relevant when spatially distributed personnel utilise technology to communicate and coordinate their work (for ethnography in CSCW, see Blomberg and Karasti (2013); for a review of CSCW, see Schmidt and Bannon (2013)). Although, these studies draw on developments within the discipline of sociology – both analytical and methodological, they have not emerged within sociology per se. Workplace studies look at tools, artefacts and technology and how they feature in work. In the editorial introduction to the special issue on workplace studies, Heath and Button (2002) state that sociology of work has largely been concerned with the predominant themes of social relationships in the labour process along with gender, race and ethnicity (ibid, p. 160) and work per se has remained a tangential concern. Workplace studies make work analysable and provide an approach to sociology of work to move beyond its essentially theory driven interests in work.

In a review essay on workplace studies, Arminen (2001) identifies the key aspects of workplace studies including its background, foundations, development as well as the fields of application and the challenges for research and development. He focuses on Heath and Luff (2000d) and Luff et al. (2000) and states that despite work being central to sociological thinking, the situatedness of work and its professional management and accomplishment *has largely escaped the sociological eye* (Arminen 2001, p. 183). He notes that naturalistic in situ workplace studies flourished at the turn of the millennium and largely centred on workplace activities, their production and coordination through naturally occurring real-time interaction (talk, visual, physical conduct) between participants. He identifies the practical background for the renewed interest in workplace studies – the proliferation of novel technology in the workplace on the one hand increased the speed and effectiveness of work, while on the other, led to resistance from workers to the proposed changes in several instances and led to dissatisfied and frustrated clients and under-used and abandoned systems. Against this background, workplace studies help to understand the actual goings-on inside the worksite and shed light on workers requirements with respect to technology which can be identified as problem solving with respect to usability for existing systems and also undertake requirements analysis for any future systems to be inducted. The naturalistic approach of workplace studies is a commitment to the detailed study of work and its in situ practices. Workplace studies reveal the reasoning and the procedures through which work is accomplished and also illumine the social aspects of technology and other resources of the worksite. The three methodological tools of workplace studies are ethnomethodology, conversation analysis and ethnography. Workplace studies have been carried out in diverse work settings and have been involved at different stages of technological implementation in the workplace and have focused on different and varied aspects of work processes. Workplace studies have concentrated on worksite which are technologically saturated, can have a potential for fatal errors and are responsible towards a large number of people. With respect to the fulfilment of the research and development potential of workplace studies, a critical challenge is posed by the issue of work practices which are essential and generic and those which are *epiphenomenal and transformable* (ibid, p. 188).

With respect to the difficulties encountered in the introduction of technology in the work place, Heath and Luff (2000c) cite, among others, two examples of dramatic failures – the introduction of the computer aided dispatch system into the control room of the London ambulance service in 1992, and the TAURUS project of the London stock exchange to introduce a computerised system aimed to replace the paper based system of certification. The computer aided dispatch of the London ambulance service aimed to replace the paper slips utilised by the controllers to jot down emergency call details and was designed to automatically match those details with ambulance location. The system was also designed to undertake scheduling and automatic crew allocation. Several problems were encountered on the day it went live, such as delayed response times, increase in time taken to respond to calls, incorrect allocation of crew, non-allocation of the nearest ambulance, arrival of more than one ambulance at the scene of the emergency etc. By the third day a semi-manual system was utilised and the system crashed completely within less than two weeks of its introduction. With respect to the TAURUS project and the London Stock Exchange, the losses ran into hundreds of millions of pounds. The authors argue that common features of many ambitious projects that involve the introduction of new technology are the *disregard for the ways in which people organise their work* and a *disdain for the ordinary resources on which they rely* (ibid., p. 3). It is failures such as these that contributed to an interest in naturalistic workplace studies.

This section provided the origins of workplace studies in disciplines, other than sociology, and highlighted that the introduction of technology and design were prominent concerns in these studies. The following sub-section 2.3.2 highlights how technology becomes visible in the working order and is made analysable in workplace studies.

2.3.2 Technology in the In Situ Working Order

Button (1993b) explores technology in the working order of the worksite. This edited features sociological *studies of work, interaction and technology*, highlighting the social organisation of technology and the contribution of sociology to the development of technology, particularly with respect to design. Several of the contributors of the volume have worked at Xerox's Palo Alto Research Centre and Rank Xerox's Cambridge EuroPARC. The studies in the volume contribute to ethnomethodological studies of work and some of them utilise conversational analysis to explore the social order of technology and its in situ social production.

Button (1993a) argues that technology vanishes from view in the studies which are proponents of the *social shaping of technology*; traditional sociological categories like gender take precedence and technology per se is not the topic of enquiry in its own right. In a similar vein the author has argued that even in the social constructionist perspective of technology, sociological theories and analysis categories take precedence and technology becomes subservient in the overall scheme of things. Technology when explored under ethnomethodological studies of work, recovers technology and brings it into the foreground by empirically studying the interactional activities that go into its social organisation and production.

Button and Sharrock (1998) study large-scale technology projects and argue that coordination is a problem of social order that can be addressed by the understanding of accountable action afforded by ethnomethodology. The researchers study the work of engineers engaged in coding for projects and highlight how the engineers make the writing of code visible and intelligible to colleagues; an essential requirement in large projects requiring the integration of code developed by several engineers. They also highlight the utilization of the 'problem wheel' by the engineers to make their work temporally accountable in the project schedule. The researchers highlight the sociology in the work of engineers working within conflicting demands posed by Total Quality Management which stresses on getting the things right the first time and keeping the schedule which pressurises them into keeping strict timelines which could result in releasing products with bugs.

A study of video mediated communication by Heath and Luff (1993) highlights the interactional asymmetries in interpersonal communication between colleagues at EuroPARC, Rank Xerox Research Laboratories in Cambridge. A sense of co-presence is provided by the technology comprising a camera, a 14 inch monitor and a multi-directional microphone; however this access transforms the conduct of participants, introduces asymmetries into the interaction and has consequences for communication. The authors show how the technologically mediated co-presence differs from physical co-presence and how video might undermine the organisation of social interaction and diminish the performative and interactional impact of looks and gestures and other communication devices. The authors show how a colleague looks at another via video to attract a response; then waves and stares and finally calls the colleague on the telephone. Similarly a participant pulls faces, puts thumbs in ears and waggles fingers but does not manage to catch the colleague's attention despite the exaggerated conduct. The authors show how the devices (direct gaze, pause, stretching sound etc.) to align recipient may pass unnoticed on a monitor thereby reducing their performative impact. The authors note that multi-directional microphones mask changes in tone when a speaker realigns gaze and therefore the speaker's shift in gaze is ineffective in engendering a response as the recipient doesn't have access to the subtle changes is tone and volume. The authors argue that the success of technology to facilitate communication will be dependent upon whether or not it can support *the delicate and systematic* *processes of interpersonal coordination found in real-world everyday work environments* (ibid., p.54).

Benson (1993) shows that the informal, situated and contingent discretionary logic utilised in decision making by members of the police force collides with the formal logic imposed by the requirements of large centralised information databases. The author highlights that this introduction of information technology to facilitate centralisation does not account for the local ad-hoc situated actions of the police and the *abstracted free floating structures* are incapable of capturing the on-ground actualities of the police work. The author sums the argument by stating, *in the way that in the social sciences statistical results are not determinative of sociological findings, then the audits of police work are not determinative of policy nor policy of police work* (ibid., p. 95).

The introduction of technology into working environments is largely undertaken to facilitate work; this introduction has been shown to create difficulties in interaction and work by being insensitive to the in situ context of the working practices. The introduction of technology then ends up cutting across 'good working practices' and even ends up defeating the very purpose of its introduction in the first place. Button and Harper (1993) highlight the inadequacy of the sales and order processing system in a foam manufacturing unit in England. The Chief Accountant of the firm summed his dissatisfaction with the system by stating, "*the system has nothing to do with what we do down here", "it's too damn slow" and "totally impractical"* (ibid., p. 99). The authors show that the system was modelled on the stages of ordering, manufacturing and invoicing which made the process sequential, which in practice it was not, and omitted local situated work practices, stripping them of their details. The authors highlight the discrepancy between *work as imagined* and *work as done*. While the organisational record may show the work done according to the sequence of *order, manufacture* and *invoice,* in reality the *accountancy record was a post hoc assembly of the day* (ibid., p. 100). The work practices of the organisation were geared towards manufacturing for same day delivery of demand. This implied that manufacturing could commence even before the processing and issuance of an order form; while the system was inflexible as only a completed order form could initiate production. The shop floor working practices interweaved ordering and invoicing into the production itself, thus an order form was a developing document and not the initiator of the production process as imagined by the sales and ordering system and at times the pricing of the manufactured foam would largely be carried out after its production. The authors argue that the *description of the details of the practices that make up work in an organization is preferable to viewing work as a decontextualized phenomenon* (ibid., p. 107) and designers would need knowledge of the work to be supported by technology so that it can support existing work practices.

Heath and Luff (2000a) considered the persistence of the usage of paper medical records by general practitioners after the introduction of the computer based system, which had been introduced to replace the paper based work practice. The authors show how the hand written entries in the medical record card are embedded in social practices and reasoning that helps doctors in reading and interpreting the record as well as formulating their own entries to make them intelligible to colleagues. The authors highlight that the location of the items within a record is a resource for doctors in making sense of it. A record can have items like the presentation of the problem by the patient, the doctor's assessment and the prescribed treatment (strength and amount). Words within single quotation marks refer to the patients' symptoms and without accompanying diagnosis or treatment can indicate that the patient has presented a trivial complaint and the patient could be someone doctors need to be wary of. The authors show how doctors design ambivalent entries if unsure about the diagnosis and with the recommendation of tests can cover themselves in case of future problems. The brevity of a record indicates to the practitioners, to read related entries and infer the course of the illness. Entries are dependent upon each other for overall meaning to emerge. The authors highlight that a range of inferences could be drawn by the doctors with respect to a patient with the paper medical record and this was completely missing with the computer based system that separated the files for medical and therapeutic history of the patients and made it more difficult to infer a more complete picture of the patient in the here and now. Thus the *broad brush strokes* on the paper record provided an information and inference rich sketch of a patient, problems, diagnosis and treatment that the computer system could not.

This sub-section highlighted the recovery of technology when explored under the rubrics of ethnomethodological workplace studies; the inadequacy of inflexible technology in ill supporting/hindering work was also noted. The following sub-section reviews studies in a certain category of work-sites termed as *centres of coordination* (Suchman, 1993) such as Air Traffic Control, underground rail control rooms, airline ground operations etc.

2.3.3 'Centres of Coordination'

Suchman (1993) characterises particular worksites as *centres of coordination*; which include, but are not limited to underground rail control rooms, air traffic control, trading centres, ground control, newsrooms etc. These worksites essentially require co-located or spatially distributed personnel to coordinate activities utilising resources, including technology. These work environments are usually saturated with technology and multimedia for the conduct of work. A centre of coordination is a work site which manages the distributed activities of different sets of participants where a set of participants is required to provide timely input to another and successful operations require cooperation between the different sets. The activities managed by a centre of coordination are vulnerable to contingencies; some arise during the course of the work itself and some the system is designed to address. Such worksites show a preoccupation with space and time, particularly in the deployment of resources (people and equipment) according to a timetable or in response to a time critical situation. Spatially distributed participants should be able to orient to the worksite and its personnel should have access to the situation of spatially distributed participants over space and time. The role of technology in such worksites is the resolution and reconfiguration of relevant spatial and temporal relations between the participants. These studies are especially pertinent to the thesis as the VTS in essence controls the movement of marine traffic in the channel and the VTS operators are embedded in the larger scheme of things in the port requiring input from diverse quarters. The work of VTS operators is supported by a technology rich environment and operators have to communicate with spatially distributed ships' bridge teams and pilots to coordinate traffic movement.

Suchman (1993) explores the work in the operations room of an airline. The nationwide computer system is accessible at each local worksite and helps to implement the flight schedule at the local level. The system of temporal accountability at the worksite is machine based and the author shows the mediating and negotiating role of the operator to maintain the relation between the received scheduled order and the local observable order. The author highlights the skilful routine of the operator in managing temporal accountability. The estimated 'time off' time entered by the operator is 20 minutes after the 'time out' from the gate which is not merely a judgement based on his observation of events outside the window and neither is it a simple matter of compliance but a managed skilful routine oriented towards the temporal discipline required by the computer system. Upon entering the 'time out' for an aircraft the internal clock of the system starts sticking and triggers an alert message after a specific interval if the 'time off' entry has not been received. In order to prevent triggering the alert message, the operator routinely enters the 'time off' as 20 minutes after the 'time out' which would keep the system quiet and when given ample time to receive the actual 'time off' from the pilot and enter it into the system. The operators utilised a range of technology available at their disposal to coordinate and hand over aircraft to ground control and vice-versa. Beyond the gate, the tower would be responsible for the aeroplanes. The operations room of the airline is also responsible for maintaining the order of the aircraft arriving for parking. Planes arriving for parking communicate with operations and an operator coordinates the passage of planes in and out of the ramp and communicates the designated parking spaces for the aircraft to the pilot. The author highlights how the operator becomes a coordinating device in the management of the *one-at-a-time* order of arrival of aircraft in the passage. Based on what the operator can see from the window, she delays giving the go-ahead to a flight to allow another aircraft to taxi by, thereby managing the queue of aircraft arriving for parking and ensuring a *one-at-a-time* order through the passage.

Heath and Luff (2000b) explore teamwork in the Bakerloo line control room of the London underground. The study explores collaboration and control in the work of on duty personnel, who range between four and six. The authors show that the work of the participants is very flexible and emergent and does not resonate with formally prescribed strict division of labour. The authors argue that given the rich complexity of the cooperative activities that accomplish the day's work in the Bakerloo line control room, a clear delineation of tasks and responsibilities and formalisation of practices into roles, task descriptions etc. will not only do *analytic injustice* the study of work at the worksite, but also, will be unreliable to serve as a foundation to design and induct systems supportive of cooperative work. The personnel who work in the London underground line control room are the line controller and Divisional Information Assistant (DIA) and two signal assistants. A paper timetable is utilised to coordinate the service of the underground and one of the main responsibilities of the controller is to be the *guardian of the timetable* and ensure a regular train service with short gaps in between. Even though the responsibilities of the controller and the DIA are formally specified and differentiated, the tasks undertaken in the control room depend upon close cooperation and collaboration and the personnel utilise subtle practices to monitor the conduct of colleagues and coordinate activities and tasks to accomplish work. Their study shows a flexible division of labour which is an emergent and facilitates personnel to support each other for the accomplishment of work tasks to manage difficulties and/or crises. The authors note that it is extremely unusual for personnel in the control room to pass on information explicitly to their colleagues as each is busy with their tasks at hand and therefore the colleagues monitor each other's conduct and initiate the required work. The DIA overhears the controller talk to the driver at 240 Charing Cross southbound and ask him to stay at the platform for two minutes longer; this interaction is monitored by the DIA, who transforms the controller's request into a relevant announcement for the affected passengers that there will be a delay of a couple of minutes in the train's departure from Charing Cross. And prior to this announcement for the passengers the DIA looks at the line diagram, sets the PA system, as well as looks at the real CCTV footage of the train before making the announcement. The authors show how the DIA subtly monitors the controller by changing position and moving closer and maintaining a careful balance between monitoring his colleague and avoiding overt attention. The authors show how certain words and phrases can trigger action by the DIA. Upon hearing the word, 'reverse' by the controller to the driver of train number 233 Southbound, the DIA calls the station manager of Piccadilly Circus to apprise him of the fact that the train would reverse to the station and thereafter he goes on to make a series of successive announcements at each station to inform passengers that the train terminates at Piccadilly Circus. The authors stress that it is not simply that the DIA remains attentive to the happenings in the control room; all control personnel organise their own conduct in such a manner that even while engaged in a task, they can monitor and if necessary participate in the activities of colleagues. To make activities visible, such as the accomplishment of train reformations, the controllers talk out aloud, seemingly to oneself, and not addressing it to any particular colleague. This renders the information publicly available and the author shows how the controller ceases to talk when he perceives the DIA and a trainee have begun a separate conversation. The authors show how the colleagues are *embedded in a complex configuration of activities and mutual monitoring that* provide the intelligibility and impact of utterances and allow participants to solve an immediate pressing problem (ibid., p. 115). The authors show that largely the controller and the DIA engage in distinct tasks and activities while at the same time participating in the conduct of co-present colleagues. The authors highlight how the activities within the control room flow between the public and the private and the individual and the collaborative (ibid., p. 124). The authors argue that any attempt towards formal demarcation of the cooperative from the individual is unlikely to be insightful or fruitful.

Theureau and Filippi (2000) studied and analysed cooperative work between rail traffic controllers, signalmen, information assistants, linesmen, train drivers in the Paris metro for the design of a support system to facilitate coordination. The objective of the research programme guiding their study was the design of computer systems as part of other available means to support end users. Their study was shaped by *course-of-action* approach to understand the internal organisation of the action and its external constraints. Their analysis included the study of activities which may be assisted by computers; analysis of assistance provided by other competent users to inspire design of computer support and analysis of activities with satisfactory computer support to define the highest possibilities of such support. The researchers recorded audio and video data, took notes and conducted *self-confrontation* interviews in which the individuals were shown video recordings to comment on specific behavioural aspects and challenges encountered. In the example of the train Naga 12 breaking down at the exit point of the station, the controller comes up with a solution to ask the train to move back a hundred meters and free the exit point, thereby allowing the rail traffic to move which had been stalled behind the broken down rain. Implementation of this solution is problematic as the driver of Naga 12 is engaged in repairs to the train and hence unavailable to take the controller's call in the front cabin. The controller passes the required message for the Naga 12 driver to the driver of Rudy 12, the train stopped along the nearby platform in an attempt to get through and subsequently Naga 12 does reverse and an alternative expensive solution considered by the controller to allow trains to run on the opposite track can be cancelled. The concerned controller considered two options as he could not be sure of the success of the first solution to utilise the driver of another train to communicate the requirement to the driver of the stricken train. Additional problems crop up with metro incidents as that of the breakdown of Naga 12 such as, finding replacement drivers, finding another train to complete the journey of the broken down train etc. and accordingly concerned individuals – other controllers, linesmen, station masters etc. have to be informed. The research showed that in case of an incident during rush hour, the urgency of the situation generated work sharing between the controllers; where the concerned controller would solve the problem of a particular train with its driver while other controllers would handle upstream and downstream traffic and troubleshoot how it would impact their own individual sectors. However, in case of an accumulation of incidents, the controllers focused on their individual sectors and a lack of coordination in passing information to concerned colleagues was found. The researchers identified three directions for supportive design; display including the *synchronical, diachronical and chronological* aspects of train traffic; rendering updates (reordering trains) visible by changing colour; and harmonising diverse information sources to manage train drivers and their missions. The researchers argue that design development in ergonomics requires the course-of-action approach as it analyses operators' activities in real work settings and is in line with interactionist studies of work and approach which considers cognition as socially distributed. Though the study did not follow an ethnomethodological approach per se, it studied in situ communication, coordination and how technology featured in the work of the controllers in a centre of coordination.

Goodwin (1995) draws upon Goffman's (1959) notion of the *front* and *back stage* and encounters to examine the collaborative formulation of responses in two different settings in an American airport. One setting for the study is the operations room of an airline (back stage) and the other is the gate of an airline where staff interact with, checking in and departing passengers. The authors show the embeddedness of workplace talk in the settings and how personnel utilise the setting itself and the tools, artefacts and resources at their disposal to collaboratively produce appropriate responses. The elliptical language of gate operators in the presence of overhearing passengers, helps collaboratively build a suitable response; for example, Sally would like to solicit a volunteer to take the airline's offer and not check in on the oversold flight, '*Two hundred. Cab.'* (ibid. p. 184) uttered by Linda, her colleague is a clue about the airline's current offer and *'Over'* (ibid) also uttered by Linda is shorthand to imply that the 8 o'clock flight usually used as protection for earlier overbooked flights it itself overbooked and unavailable. Based on the elliptical input Sally has received from her colleague, she formulates an improvised and appropriate response for the passenger –

> Sally: Mr. B at um (if) you're going to Monterey we're offering a two hundred dollar travel voucher and a cab ride as an alternative, cuz the flight is oversold.

At the airline operations gate in Goodwin's (1995) study, the assistance of a colleague in the backstage is sought through linguistic cues and the response to the pilot is assembled with interrogating the available resources as well as collaboration with colleagues.

Even though a refrigerated food warehouse does not immediately invoke the connection with a centre of coordination, Kawatoko (1999) considers it to be one, and presents the results of an ethnomethodological study of work in a Japanese warehouse that stores seafood. The author explores the organisation of the spatial arrangements of load in the warehouse together with temporal concerns (regarding arriving loads and preparing orders for leaving the warehouse) and the role of documents and artefacts in the organisation of work. The author shows the reflexive interaction between the use of artefacts and the context of work; the utilisation of artefacts is embedded in multiple contexts, while at the same time, the different artefacts themselves organise the multiple contexts of work. The overarching context of work of the refrigerated warehouse is the storage, distribution and exchange of frozen seafood. The artefacts utilised by the workers during the course of their work to organise their workplace activities are *documents, computers, blackboard and pallets* and each reflexively organises and elaborates on the other. Input orders to store seafood received by fax or telephone are immediately inscribed in chalk on a blackboard and a rough plan is prepared regarding where to store the incoming load based on this information. Remove orders received from wholesalers trigger the search for consignments owned by the wholesaler and the contents of the received order are input into the computer system and accordingly a *load out order form* is prepared in accordance with which the responsible worker with retrieve the order from the store for the waiting driver to cart it to its destination. Numbering conventions are utilised to designate the space occupied by a load, "26-45" would imply number 45 space" in cold store room number 26. The decision regarding where to place incoming loads of frozen seafood is taken after considering several contingencies such as the time of old loading (daytime, night-time), the number of cartons out-loaded at a time, the destination of the load, whether the out loading will be carried out in small lots in one big lot in one go. A big lot or loads designated for daytime out loading or those to be sent to factories for processing are placed in the back row while small lots and those for night-time out loading those to be traded in the central wholesale market are loaded in the front row for a quick turnaround. Prior to arranging of the storage space, the workers also take note of the name of the owner of the load, the content of the consignment the particular trucking company etc. For instance a truck from a particular transport company indicates in all probability that the consignment is half processed shrimps and as such should be stored in the front row or in a rack room for easy access as the goods for this particular customer are distributed quickly. The arrangement of loads in the storage area is undertaken upon utilising the entire spatiotemporal environment of the worksite as a resource. The workers use of the available storage space in the refrigerator warehouse makes the activity of organisation, distribution and exchange of frozen seafood visible and highlights that the spatio-temporal arrangement of space is an ongoing accomplishment.

An emergency response centre is also a centre of coordination and the following sub-section reviews select literature on ethnomethodological studies of institutional talk, particularly with respect to calls to emergency centres. These studies are selected from the body of literature on institutional talk as they involve the medium of the telephone and there would be lessons for this study which involves VHF radio mediated interaction.

2.3.3.1 Select Ethnomethodological Studies of Institutional Talk in Emergency Centres

Zimmerman (1992) utilises data from three emergency dispatch centres and highlights how the institutional context of emergency dispatch activity is constituted, managed locally and accomplished through interaction on the telephone. The author highlights how the outlined sequence meets the purpose of emergency calls that pertain to common recurrent contingencies but cannot cover all contingencies confronted by callers and call takers. The sequence then proves to be inadequate and is utilised as a resource to be modified, augmented or even abandoned. There are instances of hysterical callers asking for immediate assistance. In case of distraught callers who are difficult to comprehend, the sequence is modified by a repair initiation in the next turn and in some instances the call taker remains on line to reassure distressed callers that help is on the way adding to the call time. The author argues that the interactional organisation of emergency calls is related to the institutional setting and function.

Whalen (1995) studies computer aided dispatch (CAD) technology and the situated ordered production of 911 emergency calls. He highlights the standardisation of the CAD system which is designed to be indifferent to local circumstances on the one hand but is always utilised through variable and unique local circumstances on the other. The judgement the call taker needs to make about the bonafide nature of the emergency, its severity and response required, among others, shows, how the ordered organisational production of the call and its progression is more than following a pre-determined standardised technological scheme.

Fele (2008) studies radio calls to a medical emergency call centre. The author argues that video analysis of the calls makes it possible to explore in-depth the collaboration involved in the backstage production of responses to the radio calls and organising dispatches. The author shows how the technology of the radio that broadcasts messages in a shared office space is jointly monitored by the personnel while they are engaged in distinct tasks and even though their duties are clearly demarcated as that of the call taker and the dispatcher, the individuals jointly collaborate and coordinate the work in the centre. The dispatcher is responsible for talking on the radio and while the call taker answers incoming telephone calls. The author highlights the cooperation involved in the work of the centre; at times the dispatcher explicitly asks the call taker to respond on the radio on his/her behalf; at times the call taker explicitly designates self as the respondent upon perceiving the non-availability of the dispatcher and at times the dispatcher explicitly confirms self as the responder in which case the call taker delays and fine tunes the handing over of the radio. The author shows that personnel in the medical emergency call centre utilise devices such as body orientation, pointing and drawing attention to specific information and designing utterances to the co-present colleague to clarify the information to be communicated, who will pass on the information, what is happening and who should be responsible for doing what task. The intelligibility of the work is achieved with the use of devices making explicit who is doing what. The author argues that analysis of such collaboration, cooperation and co-production of work is made possible with video analysis and would largely be elusive if one relied on audio recordings alone.

Mondada (2008) explores telephone calls in a call centre. The researcher video recorded the telephone calls and explored the embedded multi-activity in the work of the call taker. The author analysed three sequential aspects of the call – pre-beginning, the call itself and the post-closing of the call. The author shows that the work of the call taker has a continuous flow and argues that audio recording the call would not do justice to the complex embedded multiple activities that take place before, during or after the call – activities such as internet searches during the call itself to formulate solutions for the callers. In the post-closing sequence the author highlights that the colleague was monitoring the call taker and upon perceiving her availability, initiated the interaction. The author shows the added analytic value afforded by video recording in the analysis of institutional telephone calls.

The studies looking at calls to emergency centres highlight the valued added by video recording which demonstrates the embeddedness of the call in the larger work context. In the ethnomethodological vein, these studies highlight the local, situated, collaborative and contingent practices to accomplish work. Overall this sub-section highlighted studies in centres of coordination that require coordination and cooperation utilising resources, including technology to provide timely input to colleagues and accomplish order. It is also highlighted that it would be analytically unjust and inadequate to take clear cut formal divisions of work at face value, given the cooperative and collaborative accomplishment of in situ work.

The following sub-section highlights the context dependent and the contingent nature of rules in the worksite.

2.3.5 Context Dependent and Contingent Rule Following

In one of the early workplace studies, *Plans and Situated Actions*, Suchman (1987) studies human-machine communication and argues that a *planning model* of human action serves to 'confuse *plans* with *situated actions*' (ibid. p. 3, original emphasis). HCI is based on planned models of human action/conduct, however such an approach is shown to have its shortcomings as the context of the conduct recedes into the background, away from analysis. She demonstrates that the meaning of the pre-determined rules are context dependent and are invoked as a resource by which participants order their own conduct and interpret that of others. The rules and scripts are not by themselves a determinant of conduct; howsoever detailed they may be; they depend upon the in situ sense-making of individuals for their invocation, use and intelligibility. An understanding of the technology and the rules requires the study of how they feature within the everyday work. Her research highlighted the need for a shift in research methodology from the deterministic and experimental to the social, situated and contingent.

With respect to the context dependent nature of rules, a classic ethnomethodological study of the rehabilitative centre 'halfway house' by Wieder (1974), shows how the residents (convicted drug addicts and paroled addicts) utilise the convict code to make actions visible, coherent and intelligible in context. The convict code is invoked to formulate grounds for action – not snitching on fellow residents underscores loyalty with fellow inmates and highlights the stance of non-co-operation with staff. He highlights how the staff use the code to account for their own failures. Wieder (ibid) examines rules, motives and conduct in traditional sociology and argues that rule descriptions are inadequate to explain in situ conduct. He argues that rules are part of the local contextual sense making by the actors and should be treated as such. The review of Wieder (1974) by Watson (1977) highlights the limited transcribed examples of conversations in the halfway house and states that Wieder's (ibid) analysis would have more detail if he had utilised conversation analysis in his study. The epistemology adopted in this study will be justified in section 2.7 and highlighted in chapter 3 on research methods.

Ethnomethodology's programme of workplace studies explores the haecceities of work and studies work as an in situ, social, situated, local, embedded, embodied and contingent ongoing accomplishment. The recovery of technology and the contribution of ethnomethodological workplace studies to design is one of the many contributions of these studies. The modification of available resources, their augmentation and even their abandonment is part of accomplishing in situ work as demonstrated by these studies. The inherently cooperative and collaborative nature of work is revealed by these studies which is largely at odds with the clearly demarcated and defined job roles and responsibilities. The studies highlight the gap between work as carried out in situ and work as imagined on paper. These studies show rule following as a context dependent and contingent activity and demonstrate that workplace studies foreground work and its accomplishment instead of abstract sociological categories.

Air Traffic Control is a centre of coordination and it taken up separately in the following section, 2.4, which reviews literature on ATC within aviation transport that can be said to have similar goals as the VTS to keep the traffic flowing smoothly and the area under purview, incident free.

2.4 Air Traffic Control (ATC)

Aviation, like shipping, employs a diverse workforce that comes together for the duration of the flight to work on-board a mobile workplace. The bridge of a merchant vessel could be likened to the cockpit of an airplane in terms of navigational control and command. The ATCs and VTSOs are locally recruited worldwide and hence in both work settings, a diverse workforce might be talking with non-native speakers of English. ATCs and VTSOs in the two transport modes are responsible for the safe and efficient movement of traffic in the entrusted geographical area.

Like shipping, aviation too employs English as the international language of communication. Many studies on talk and interaction in aviation have focussed on the interaction between pilots in the cockpit (Nevile 2004; 2006, 2007) and interaction between the pilot and the Air Traffic Controllers (ATCs) on the ground (Howard 2008a). The focus of aviation studies has largely been on safety, learning from accidents (Driscoll 2002) and common language and communication protocol while communicating with Air Traffic Controllers (ATCs). Grammatical forms help coordinate temporal dimensions of cockpit work (Maurice 2007) and a structured formal controlled language helps identify the aviation discourse structures that remove confusion and help the crew and tower coordinate efforts to avoid aviation incidents (Sassen 2005). The communication between the Pilot and the ATC utilises questions to mitigate confusion and establish clear communication, which has parallels with the eight message markers as delineated in the SMCP (IMO 2002b). The eight message markers of the IMO SMCP (2002b) are – *Question, Answer, Request, Intention, Instruction, Information, Advice* and *Warning*. Prefixing a message marker to a VHF utterance aims to clarify the import of the message that follows.

Aviation and shipping both use English as the common shared language for international operation; the bridge and the cockpit have command and control of the two transportation modes respectively and clear talk is imperative for safe and secure operations. Interactive talk in shipping, encompasses communication exchanges between bridge team members, 'ship to ship', 'ship to shore' and between crew members. In aviation, interaction takes place between the cockpit crew members, flight attendants and between the pilot(s) and the ATCs on the ground. There are many parallels between shipping and aviation. Research on communication in aviation has limited itself to the cockpit and communication despite being problematized in shipping, largely remains an under researched area (Sampson and Zhao 2003; Horck 2004).

There is a limited body of literature on ATC from an ethnomethodological perspective. A large body of literature on ATC is in the discipline of Human Factors or Ergonomics and pertains to design and technology (for organisational climate and preparedness for the introduction of new technology, see Arvidsson et al. (2006); for cognitive shaping of the mental picture of ATCs, see Malakis and Kontogiannis (2013); for technical collaboration between the flight deck and ATC, see Cox et al. (2007); Sharples et al. (2007); for datalink and human factors issues in communication, see Stedmon et al. (2007); for modelling of ATC work processes and continuous work development, see Teperi and Leppänen (2011); for human factors interfaces, see Chang and Yeh (2010); for the management of emergencies, see simulator studies by Malakis et al. (2010a, 2010b)).

The ATC is *a centre of coordination*. In the ethnomethodological vein, Harper and Hughes (1993a) explored work in the Air Traffic Control (ATC) centre in the United Kingdom (UK). The technology available to the ATC operators is extremely sophisticated and includes computers, radars, information received from beacons, flight progress data and communication equipment. The authors highlight how the printed flight strips are *worked* by the VTS operators to develop a picture of the traffic for their sector, make sense of the current traffic situation in their area of responsibility and achieve order in the sky. The controllers fill in several pieces of information pertaining to a flight on the flight strip like its *reporting point, time of passing the reporting point, call sign, type of aircraft, planned flight path, requested cruising height of aircraft, departure and destination airports etc.* The strips also contain detailed information related to flights which have not yet entered the sector. Strips are key to the witnessability of work and its intelligibility within the ATC setting. A strip becomes alive when an aircraft enters a sector and accordingly it is organised and placed in a separate rack. Strips help to order, organise and control ATC work and are an essential instrument / resource in the work of the operators. The management of strips aids in achieving order; they are sequentially ordered –

the strip for the first plane to arrive is placed at the top and the one for the last, at the bottom. Problem strips are marked for attention by ‘cocking them’ or lifting them to increase their visibility in the rack. According to an operator, in the first instance, operators refer to strips to check for any potential conflicts that require resolution in their sector and thereafter check the radar. According to the operator it would be nearly impossible to go over all the radar blips on the screen for conflict resolution. The entire control history of an aircraft is embodied in the flight strip. A colour protocol is followed by the different personnel to make notes on scripts which preserves the changes made to the scripts and also attributes them to personnel thereby providing accountability. The authors show that in the situated character of the work, the flight strips, technology, work activities and rules are all interwoven; and seen from within, the system cannot be seen with a strict distinction between the technical system and the user but as an ongoing accomplishment.

Harper and Randall (1992) explore ‘conflict’ in the airspace from an ethnomethodological perspective. The authors conducted their study in the Air Traffic Control Centre in London and studied how the civilian and military controllers accomplished the activities. The authors show how civilian controllers perceive and treat the interface of civil and military operations as conflictual. The authors show that the civilian controllers are aware of the differences in military and civilian control and orient to the ‘rogue’ military planes as a problem to be solved. The military aircraft in or about to enter controlled civilian airspace are considered rogues as civilian controllers cannot be sure of their intentions, trajectory, flight path etc. and need to liaise with military control to obtain information and solve the situation. The authors argue that conflict and its resolution can be treated as an accomplishment and therefore an accountable feature of work.

Arminen et al. (2014) studied ATC training in a simulator environment. The research utilised ethnomethodology and conversation analysis to explore the adjacency pair of the trainers’ prompts and the multimodal response of the trainees. The authors show that ATC work entails multiactivity involving diverse artefacts and actors; and the trainers’ prompts serve to engage the trainees in reasoning and carry out related tasks. The prompts draw attention to the pending task(s) to be accomplished by the trainee by pointing out if a larger picture is being missed by the trainee and it also serves to evaluate the trainee’s current understanding of the situation. The trainee’s response encompasses a wide range of actions to demonstrate the accomplishment of the pending task and is not limited to a verbal response alone. The multimodal response of the trainee reflects back upon the trainer's prompt and makes it sequentially relevant in the instructional sequence. The authors highlight that *talk in aviation training is embedded in embodied, practical actions in a socio-material context* (ibid, p. 61). Practical and verbal actions are inextricably reflexively intertwined in the context of ATC training. In this respect the authors shed light on practice based teaching and learning and argue that Instruction Response Evaluation (IRE) sequence cannot be used as a basis for apprenticeship training in the ATC which is an embedded, embodied, dynamic and a reflexive training situation. The IRE sequence occurs outside of the training while apprenticeship requires engagement within the training itself as highlighted by the trainer prompt and multimodal trainee response sequence.

On the surface, the work of Air Traffic Controllers and Vessel Traffic Service Operators may come across as similar, however the two settings are vastly different and diverge on the issue of remote pilotage. While the airline pilot is essentially dependent on the ATC to remotely guide and successfully land the aircraft, the ship Master is not similarly dependent on VTS operators to successfully berth the ship. On the legal front, The ATC is more internationally regulated than the VTS (ICAO 1944, 2006 edition; Nolan 2010). Air traffic controllers are responsible for the safety of aircraft (Hopkin 1995) while the VTS operators may not be responsible for vessel safety as the responsibility of the VTS is ascribed by the national competent authority and the local VTS authority (IALA 2008) which differ from country to country and even within a country. Several issues are presented in Hadley (1999) pertaining to remote pilotage in shipping, such as the issue of legal liability, language proficiency, training, Master's lack of knowledge of local port conditions etc. and for the foreseeable future the trend of pilotage for some types of ships is likely to continue (Bruno and Lutzhoft 2009). Closely related to future technological development in the VTS is the IMO's (2009) concept of e-Navigation which is the –

> "harmonised collection, integration, exchange, presentation and analysis of maritime information on-board and ashore by electronic means to enhance berth to berth navigation and related services…" (MSC 85/26/Add.1/Annex 21, IMO, 2009)

e-Navigation is intended to support remote pilotage in shipping, in the provision of which, a qualified VTS operator remotely guides the ship through the confined waters with the help of advanced technology. Remote pilotage is considered useful in bad weather and dangerous sea conditions which are unsuitable for pilot boarding. Remote pilotage is also attractive to ports from the cost savings that can be made by not sending a pilot on-board each time. These savings can be transferred to shipping companies as reduced port dues, thereby making the port more attractive than its competitors (Hadley 1999; Bruno and Lutzhoft 2009). Evaluating the workability of e-Navigation is beyond the scope of this study. However, implementation of e-Navigation has its challenges. It has been pointed out that there has been an unequal development of technology on-board and ashore, there is lack of harmonised training and there is a need for standardisation and clarity on legal liability (Allen 2009). Ships, unlike aircraft are not highly standardised and each new built ship can have a completely one off new design. Local conditions in seaports vary greatly, unlike airport runways which are more predictable and standardised. Solutions from one transport sector cannot readily be applied to the other as both have their inherent differences (Hadley 1999).

This section has discussed Air Traffic Control and the issue of remote pilotage on which the ATC and VTS diverge. The section has also discussed the concept of e-Navigation in shipping. In the following section (2.5), I review research on the VTS.

2.5 Research on the VTS

The VTS is established by a competent authority in areas where a need is envisaged for the establishment of such a service (IMO 1997b). Academic research on the VTS has largely focused on the technical development of the VTS as a system, individual components of the decision support system and mathematical modelling/fuzzy logic for enhancing efficiency of traffic throughput and/or the prediction of vessel trajectories to avoid collision (Eide et al. 2007; Kao et al. 2007; Hoye et al. 2008; Nilsson et al. 2009; Tsou and Hsueh 2010; Bukhari et al. 2013). The technical studies in the VTS have largely been conducted without considering the input from VTS operators and it has been presumed that the suggested mathematical models and/or introduction of new technology will support the work of the VTS operators, reduce operator workload and be beneficial to them (see Praetorius et al. 2012).

Limited research has been conducted on the non-technical aspects of the VTS – studying the work of the VTS operators and the organisation of work (see Brödje et al. 2010; 2011; Praetorius 2012; Praetorius et al. 2012; 2013). Qualitative research on the VTS has largely been approached from within the discipline of Human Factors (Froholdt 2010; Brodje et al. 2013), Complex Socio Technical Systems (Nuutinen et al. 2007; Praetorius 2012), C4I[19] Environments (Brödje et al. 2011), Accident Analysis, Naturalistic Decision Making, High Reliability Organisation and Cognitive Systems Engineering (Praetorius et al. 2010; 2012). The studies have used a range of research techniques to generate data – interviews, focus groups, simulation exercises, observations, shipboard fieldwork, ethnomethodologically informed conversation analysis and ethnography. What follows is a comprehensive review of literature pertaining to research in the VTS. This thesis does not draw upon literature on the technical aspects of the VTS, as it is not the main focus of the research, however the same is alluded to in the literature review to provide the scope of the research conducted in this area. Section 2.2.1 reviews literature on the VTS' technical equipment and how it contributes to the safety function of the service.

2.5.1 Individual Components of VTS' Decision Support System

Individual equipment used in the VTS decision support system, such as the radar, AIS and VHF radio have received significant academic attention. Positive identification of vessels is imperative in congested waters as accurate identification is a prerequisite to undertaking further communication with the target vessel and/or carrying out evasive manoeuvres, if required. AIS is a transponder system capable of transferring and receiving information that can positively identify ships (Mora et al. 1998; IMO 2001). Amendments to SOLAS chapter 5 have made it mandatory for vessels over 300 GRT engaged in international voyages and all passenger vessels to be equipped with the AIS by 2004 to ensure compliance in the first phase of the implementation (IMO 1974). AIS has been studied in the VTS as a tool to be integrated in the decision support system available to the VTS operators and it is useful in Search and Rescue operations (Graveson 2004). AIS technology is a vital competent of pilotage operations and sea pilots have raised concerns regarding the unavailability of the plug-in for the Portable Pilot Unit in some makes of AIS (Pratt 2004). Chang (2004) argues that AIS information should be used to reduce inter-ship VHF communication, however, studies have revealed that the opposite is true; AIS has contributed to an increase in voice communication over the radio between ships (Bailey 2005; Bailey et al. 2008).

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[19] Command, Control, Communications, Computer and Intelligence

Bailey (2005) conducted research at the Dover Coastguard Channel Navigation Information Service (DCCNIS) and found an impact of AIS on VHF radio use. The research found that 90% of the VHF calls were undertaken for collision avoidance (see IMO 2003), which is antithetical to the IMO Collision Regulations (COLREGs) (IMO 1972) which advocates against the use of VHF for collision avoidance and is further discussed subsequently in this section. The research further found that even when the information was already available via the AIS, it was continuing to be obtained and confirmed over the VHF radio. Unnecessary and confusing communication as well as rule breaking was also found in the VHF interactions in the study. The study by Bailey (2005) is conducted from the point of view of shipboard seafarers while mine is from the shore based perspective of the VTS. Bailey (2005) also addresses the training needs of the seafarers with respect to the introduction of new technology on-board and recommends that training should not be limited to the operation and limitations of AIS equipment, but should encompass *the broader activity of navigation and collision avoidance* and the manner in which the information available from the AIS is put to use. The research argues that in addition to developing training pertaining to the AIS, enhanced regulatory monitoring should be carried out and procedures with respect to data entry and standardised communication via the AIS should be codified (also see (Bailey et al. 2008)).

Sanders (2003) analyses informal conversations over the marine radio at sea. The book chapter is titled, *'Conversational socializing on marine VHF radio: Adapting laughter and other practices to the technology in use'* and in it, he examines how the technology of the two way marine radio which does not allow the speaker to both listen and talk / transmit at the same time, shapes the management of laughter and the handling of gaps in the conversation and other responses in casual conversation at sea. The author highlights the tolerance of gaps on the marine radio in informal conversations and highlights the repeat transmission of laughter after a gap, to imply the genuineness of the laughter in the first transmission. Sanders' (ibid) specifically studies informal and casual conversations over the marine radio, while my study specifically focuses on the interaction on the main working channel of the port which is key to accomplishing institutional VTS work. Furthermore, he monitored interaction on the radio and upon catching an informal conversation on a channel, would record it for further analysis. This approach implied that not all of the conversations were recorded from the beginning. Sanders (ibid) did not study marine radio communication in the context of institutional work. My research on the other hand, specifically studied VTS' work largely conducted over the VHF, and recorded all real time naturally occurring interaction on the port radio channel to facilitate my study and is discussed further in chapter 3 on research methods.

Naturally occurring interaction on the VHF radio is the primary source of data for my research and helps me identify and nuance the in situ fine-grained practices of harbour and fairway navigation (Sacks 1989; Garfinkel 2006). An overview of the literature on the VHF radio and a discussion about its use at sea, including the regulatory environment is important for contextualising the study. The use of the VHF radio in collision avoidance is contentious, however it is increasingly being used for this purpose (Bailey 2005; Bailey et al. 2008). Two key considerations regarding the use of VHF in collision avoidance are – positive identification of the target vessel and a common language of communication (Harding 2002; Stitt 2003, 2004). Both these considerations can be addressed if positive identification is achieved with the help of AIS input or ascertaining target position with respect to navigational points and/or aids to navigation and if the speakers speak the same language as in the case of local sea pilots. In the United States of America (USA), most of the radio interaction in the waterways is between experienced pilots who are native speakers of English. The USA, considers bridge-to-bridge radio telecommunication as important for navigation in US waterways and has legislated for its use (USCG 1971; Harding 2002). In the collision of the *Alva Cape* with *Texaco Massachusetts,* the National Transportation Safety Board investigation stated –

> That any doubt concerning the course of the intention of the other vessel could have been readily resolved by the use of bridge to bridge radiotelephone, if the vessels had been so equipped (NTSB 1967, p. 17).

The NTSB (1967) accident investigation report further went on to add that the Commandant of the United States Coast Guard (USCG) should –

> continue his efforts to effectuate a requirement for bridge to bridge radio telephone aboard vessels in navigable waters of the United States (NTSB 1967, p. 18).

Similar findings can be found in other accidents in the USA. The NTSB identified the lack of bridge-to-bridge radio communication as an issue in the *African star* accident with *Midwest cities*. The NTSB noted –

> Voice bridge to bridge radiotelephonic communications capability on a uniform operational frequency would probably have prevented this tragedy. Radio affords instant information and the opportunity to assent or object to the passing proposed by the vessel initiating the communication (NTSB 1970, p. 7).

In the collision between *White Adler* and *Helena*, the investigation report noted –

> That strict compliance with the Rules of the Road would have prevented the casualty. The casualty might also have been prevented by the use of bridge to bridge radiotelephone communication by the vessels involved to facilitate an agreement on the method of passing (NTSB 1971, p. 22).

In 1971, the USA formulated the United States Vessel Bridge to Bridge Radiotelephone Act which states (USCG 1971) –

> Each person who is required to maintain a listening watch under section 5 of the Act shall, when necessary, transmit and confirm, on the designated frequency, the intentions of his vessel and any other information necessary for the safe navigation of vessels.

The USA considers bridge to bridge communications, an important part of navigation in US waterways, however has urged caution with respect to its haphazard use (Cahill 1979). The United Kingdom (UK) on the other hand is not in favour of the use of VHF to undertake communications related to collision avoidance. Several accidents have taken place in which the colliding vessels had interacted on the VHF radio and agreed upon evasive actions before the point of contact, as in the case of *Mineral Dampier* and *Hanjin Madras* (QBD 2000).

In passing judgement on the accident of the *Maloja II* with *John M*, Justice Sheen stated –

> I must, once again, draw attention to the dangers of communicating with unknown vessels by VHF…But it is very probable that the use of VHF radio for conversation between the ships was a contributory cause of this collision, if only because it distracted the officers on watch from paying careful attention to their radar… any attempt to use a VHF to agree the manner of passing is fraught with the danger of misunderstanding. Marine superintendents would be better advised to prohibit such use of VHF radio and instruct their officers to comply with the collision regulations (QBD 1993, p. 8).

The UK Maritime and Coastguard Agency (MCA) (2006) considers VHF communication undertaken for the purpose of collision avoidance to be an alarming and dangerous trend (see

MAIB 2014). The MCA (2006) issued the Marine Guidance Note (MGN) 324[20] on the *Operational Guidance on the Use of VHF Radio and Automatic Identification Systems At Sea*. MGN 324 states that –

> Although the use of VHF radio may be justified on occasion as a collision avoidance aid, the provisions of the Collision Regulations should remain uppermost (MCA 2006, p. 1)
>
> There have been a significant number of collisions where subsequent investigation has found that at some stage before impact, one or both parties were using VHF radio in an attempt to avoid collision. The use of VHF radio in the circumstances is not always helpful and may even prove to be dangerous (MCA 2006, p. 3).

Cahill (1979) argues that an important benefit of the VHF radio is to reduce uncertainty in encounters at sea. Stitt (2004) states that the AIS and the VHF should be considered as one of several tools available to the officer of the watch (OOW) to fulfil the obligations under the COLREGs. Stitt (2003) proposes that the use of the VHF should be considered under three separate headings – in harbours and confined waters requiring pilotage, in inland and coastal waters, and in the open sea. Stitt's (2003) discussion of the VHF use in harbours is relevant to my research as my study is in a port VTS situated in a harbour requiring compulsory pilotage. Stitt (2003) states that VHF exchanges in such confined waters would mostly be between experienced skilled professionals (pilots) who are used to working together, possess in-depth knowledge of the local waters, follow similar procedures and speak the same language and it is unlikely that their use of the VHF would be challenged by anyone.

Adherence to COLREGs is recommended to avoid accidents at sea (IMO 1972; MCA 2006). Belcher (2002) provides *a sociological interpretation of the COLREGs*. Using the example of a multiple vessel collision avoidance encounter, he highlights the *conflict, tension and lacunae* within the regulations. He further argues that in order to improve safety at sea, risk of collision would need to be eliminated by a physical separation of traffic so that the risk ceases to exist and the rules with their contingent defeasible nature would no longer need to be applied. The practical implementation of Belcher's (2002) suggestion for the physical separation of traffic is beyond the scope of this study; however the identification of lacunae in the rules is an interesting finding that points to the contingent nature of rule following useful for my study.

[20] MGN 324 replaces MGN 22, 167 and 277.

In this section I have discussed the literature around individual components of the VTS, namely the AIS and VHF. In the next section I review qualitative research on the VTS, which has been conducted and applied in different ways, and a limited number of studies have also looked at VTS operators.

2.5.2 Qualitative Research on the VTS

Qualitative research has explored the VTS as a service (Buller and Jurzinski 1986; Goss 1986; Babu and Ketkar 1996; van-Westrenen and Praetoris 2014; Praetorius et al. 2015) and has also looked at the work of VTSOs, albeit in a limited manner. The impact of the introduction of new technology in the VTS has been studied with respect to the consequences by measuring the situational awareness of VTS operators (Wiersma and Mastenbroek 1998; Wiersma 2010). Such studies have used simulation to elicit responses and have not considered the in situ real-time dynamics of VTS work.

Brödje et al. (2010) approach research in the VTS from the perspective of human factors, complex socio technical systems and simulation theory. Brödje et al. (2010) explore how VTS operators build their situational awareness and use the method of Applied Cognitive Task Analysis (ACTA) in interviewing VTS operators. Simulation exercises are a part of the interview process to explore how the VTS operators use the available sensors to build their situational awareness of the dynamic environment. The study revealed that the VTS operators considered the radar and the VHF as their preferred main sensors, while the information received from the AIS was considered supplementary. The study found that the VTS operators build their situational awareness holistically by combining the information from the sensors with their knowledge of the local area and nautical experience. Brödje et al. (2011) have found Applied Cognitive Task Analysis combined with mid-fidelity simulation to be a useful knowledge eliciting interview tool in the context of the VTS which helps them to explore the work of the VTS operators.

Nuutinen et al. (2007) regard the VTS as a highly complex socio-technical system, and approach it from within the field of ergonomics. The results of their study showed that there were differences in the *'outcome, practices and conception of core task'* across the different experts of the four Finnish VTS centres studied. The authors argue for continuous development in the VTS while recognising the need for working towards a new VTS system. The authors argue that one way of evolving, is the creation of reflective practices within the VTS, supported by annual simulator exercises aimed at the development of procedures. The authors argue that all of the pressures on the complex socio-technical system should be taken into account (social, political and technological pressures) and system development should take place together with a dynamic and open vision of the target future. The authors do not mention economic pressure and I believe that the same should be acknowledged, given the importance of revenue generation in port operations and the attractiveness of a fast port turnaround for lower port dues. Their finding that there are differences between the different VTS centres is similar to Praetorius (2012) who states that different services may be provided under the label of the VTS, which makes it difficult for seafarers to know what to expect from the VTS.

Brödje et al. (2013) explored (mis) communication in VTS operations utilizing interactive mid-fidelity simulation. The study revealed that even though VTS operators are aware of the developing traffic situation in the VTS area, at times the operators on purpose, chose not to inform the Officer of the Watch (OOW) of ships or pilots undertaking pilotage, of the safety concerns, except when they are bound by protocol. They found that when VTS operators felt comfortable with the unfolding traffic situation and believed that all listeners on the VHF would be aware of the traffic and possess a similar understanding of the unfolding situation, the VTS operators need not explicitly communicate the information. The VTS operators do not inform if they consider the information to be superfluous as they do not wish to come across as talking down or appearing supercilious. They also found that behind purposeful miscommunication lay the negative attitudes between the working groups (pilots and VTS operators) and the lack of regulation concerning the VTS regarding the roles and responsibilities. The VTS operators' anticipation of sour attitudes from the pilots affects communication between the two groups according to this study. Noteworthy is that this study took place in a simulated environment and did not utilise naturally occurring data on interaction.

The system design of the VTS was modelled utilising the Functional Resonance Analysis Method (FRAM) by Praetorius et al. (2015) who utilised the developed models to contribute to our understanding of resilience in everyday VTS operations. The performance variability in the VTS socio-technical system enables it to adjust its performance in routine and non-routine situations to carry out and sustain required operations (also see Hollnagel 2011). The study utilised focus groups, interviews and observations to develop the FRAM models which highlight the pertinent functions and their dependencies that can help to understand the functional resonances that may accrue in unexpected ways ultimately leading to an accident. The FRAM focuses on the functional level while an ethnomethodological approach as employed in my study can help to understand the accomplishment of the functions themselves.

Praetorius et al. (2010) studied maritime safety in the VTS utilising interviews, a focus group and observations. The study explored maritime safety within the frame of Naturalistic Decision Making (NDM) in which operators are faced with ill-structured problems in a dynamic environment. Multiple players and conflicting goals are a feature of this uncertain environment and in this situation it becomes difficult for the VTS operator to safely decide whether or not to interact with the traffic and/or to react to the developing situation. The study found that the decisions of VTS operators are highly context dependent. The research further concluded that maritime safety depends upon the experience and expertise of the VTS operator together with situational factors at play. Thus maritime safety for the VTS operators is embedded in the context rather than the international regulatory framework provided by the IMO (1974).

Praetorius et al. (2012) sought to define maritime safety in VTS drawing upon diverse stakeholders – the IMO, IALA, Lloyd’s register, European Maritime Safety Agency (EMSA) etc. The study found that there was no standard, uniform definition of safety and each stakeholder had a different understanding of it, and two of the stakeholders, including the IMO had no definition of maritime safety. The authors found a gap in the understanding of safety from the point of view of the actors in the maritime sector. For the VTS operator, safety was the absence of accidents when, *“nothing happens”* similar to the *“accident zero”* campaign of the IMO Secretary General (Sekimizu 2012) while four of the seven actors had no definitions and/or they were not stated explicitly. The authors suggest that a common definition of safety should be provided that captures the dynamic component and in the case of the VTS operators, highlights their context dependent enactment of reliability.

Praetorius and Lützhöft (2012) summarise three studies conducted under the EfficienSea research project. Their study utilised observations, semi structured interviews and a focus group to explore the user needs of VTS operators pertaining to dynamic risk management in the VTS environment. The researchers identified *that non-technical support is a big part of the daily work of VTS operators* and equal attention should be paid, both to the technological development in the VTS as well as to the provision of non-technical support like improved procedures, checklists and guidelines. The participants in their study reported that the available non-technical support increased the paperwork thereby increasing the overall workload of the VTS operators. With respect to the technological developments, the researchers recommend presentation of the right information at the right time which is highly context dependent. They recommend the clarification of the *overall scope and goal* of the VTS. The research identified a key concern about the VTS service which is regulated at the international level, but implemented through national legislation at the local level. The VTS service does not have a common training course and the service is interpreted differently in each country which makes it difficult for international ships using the VTS to know what to expect from the different VTSs they encounter across the world. Seafarers aboard international ships might experience differences in the VTS services provided under the label of the VTS.

Froholdt (2011) has researched Land Based Traffic (LBT)[21] from the perspective of human factors. She studied the *practical realisation of institutional practices in technologically mediated routine and non-routine interaction in the maritime industry* utilising ethnomethodologically informed conversation analysis and discursive psychology. She builds upon the micro-analytic study in shipping by Bailey et al. (2006) and explores the displays of the *confirmatory form*. While the study by Bailey et al. (2006) analysed talk between co-located participants on the ship's bridge, Froholdt (2011) analysed the interaction between the spatially distributed LBT operator and shipboard seafarers. Bailey et al. (2006) identify the *confirmatory form* as an important feature of the bridge team talk which Froholdt (2011) notes is the practical realisation of the IMO identified (2002b) *pre-script called the read back*. Her research shows that the confirmatory form identified by Bailey et al. (2006) is a practice which enables the speakers to *sequentially organise a version of a pre-script*. The *read back* is akin to closed loop communication in which the information is repeated to the speaker which is then acknowledged and confirmed. Froholdt's (2011) research shows that absence of the *read back* is sanctioned, it is not enough to supply the first part of the *read back* and it provides an opportunity for correction. She also finds that the *read back* is not necessarily the repetition of identical information, it is reformulated and/or personalised depending upon the context. She explores *rule following in pre-scripted Maritime user device interaction*. She combines ethnomethodology, conversation analysis and ethnographic observations along the lines of

[21] Land Based Traffic; the interaction contained in the research is between ships and the shore based land-based traffic operator(s), however the author does not state that the field work was carried out in a VTS office.

Suchman (1987) to explore the sense-making that accompanies rule following in context in the LBT centre. The research finds that making a VHF call (see Pritchard and Kalogjera 2000) has a unique prosody, a *"calling outness"* feature, a special kind of *hailing* that the speakers orient towards and respond to.

Froholdt (2011) also finds *truncated actions* in VHF utterances in which several pieces of information are presented in a single turn at talk (Schegloff 2007). This telegram-like compressed, condensed and abbreviated form has been identified as a design feature of radio talk (Hutchins 1995; MARCOM 1999; Pritchard and Kalogjera 2000). Froholdt (2011) also discusses the role of *'over' as a discursive resource in elongated turns*. She finds that 'over' is not used according to the prescribed rules given in the SMCP (IMO 2002b) to signal the end of each turn at talk, but rather is used in a context specific manner. She found that 'over' was usually used with truncated actions after an elongated turn.

My research on the management and coordination of harbour and fairway traffic locates the VTS operators at the centre of my research efforts. The study is not conducted from the point of view of harbour pilots, however they are an important social group interacting on the VHF radio and my study contributes to the limited research available on pilots and piloting (Hutchins 1996; Hadley 1999; Lutzhoft and Nyce 2006; Bruno and Lutzhoft 2009; Said et al. 2013; Lappalainen et al. 2014).

Bruno and Lützhöft (2010) explored the *human aspect of shore based ship assistance* and in addition to conducting ethnographic observations, carried out interviews with VTS operators and pilots. The research found communication and trust to be linked in the VTS. Linking of communication to context, helps create trust. Empathy from VTS operators, to comprehend where the mariner was coming from, was considered important for the creation and maintenance of trust. Darbra e al., (2007) utilised standardised questionnaires to elicit responses from pilots in Australia and New Zealand to gauge *safety culture and hazard perception* of pilots. A question on onshore services elicited several complaints about the VTS operators and their training, a finding that is further taken up in my research.

In the following sub-section (2.5.3), I provide an overview of milestone research projects on the VTS, including those that take into account the e-Navigation initiative of the IMO (2009).

I also highlight some of the future developments in this area. Sub-section 2.5.3 helps to contextualise my research and its contribution to the maritime sector.

2.5.3 Research Projects on the VTS and Future Developments

Prior to the IMO (2009) e-Navigation initiative, several landmark research projects funded by government agencies such as the European Union have been conducted on the VTS, such as COMFORTABLE, VTMIS-NET, MarNIS, to name a few. The introduction of new technology in the VTS necessitated the need for research in this area to support VTS operators to understand the technical solutions offered by the advanced VTS equipment. Research focus included the adaption of novel solutions to the real-life requirements of the VTS operators. These projects focused largely on the development of technical tools and solutions for the VTS.

- COMFORTABLE[22] – was funded under the 4th research and technical development framework programme of the European Commission (EC) and ran from 1996 to 1999. The primary objective of COMFORTABLE was the development of supportive tools for VTS operators which would aid them in recognising and assessing developing traffic situations as well as carrying out risk evaluation. The project consortium consisted largely of technical universities, industry partners and government entities. The research was largely technologically driven and utilised workshops with end-users to evaluate situational awareness. The key results of the project related to enhancements in the display of traffic situation with integration of VTS and ECDIS, together with collision warnings, prediction capabilities and data sharing functionality. Human factors were considered for the integration of the various solutions developed in the project. The project had not approached the research as a study of work, however it recognised the usefulness of a user-forum as a key resource in the different stages of concept, design, development and testing (Regelink et al. 1999).

- VTMIS-NET[23] – was also funded under the 4th framework programme of the EC. The main aims of the project included the linking of existing standalone European VTS installations. The linkages would support the establishment of Vessel Traffic

[22] COMFORTABLE, online at: http://www.transport-research.info/web/projects/project_details.cfm?id=226
[23] VTMIS-NET, online at: http://www.transport-research.info/web/projects/project_details.cfm?id=101

Management and Information System (VTMIS) networks at the local, regional and European level. Sharing and dissemination of information, including access to pertinent maritime information sources (hydro-meteorological, ship specific information, cargo data, and marine environment pollution information) was crucial for the project. The development of the VTMIS network, its architecture and developing tools for enhancing operations were among the main objectives. The consortium included research institutes, industrial partners, and government authorities including defence research and port authorities. The project had an overtly technical focus. User fora were organised in VTS sites to gauge user requirements (technical and operational). The final report of the project mentions the difficulty in obtaining user requirements due to the attitudes of the end-users. The report notes that end-users are adept at adapting *themselves to severe operational and system deficiencies* and therefore experience difficulties in the articulation of their needs (VTMIS-NET 2000, p. 14).

- MarNIS[24] – Maritime Navigation and Information Services project was funded under EC's 6th framework programme and ran for four years from 2004 to 2008. It takes into account EU's e-Maritime strategy and is in line with IMO's (2009) e-Navigation. The project sought to introduce a 'one stop-shop' to enable ship master's to seamlessly communicate with diverse stakeholders and authorities and fulfil the different reporting requirements. The project sought to enhance the capabilities of the SAR authorities across Europe with respect to the monitoring of coastal traffic and undertaking anti-pollution measures (Jarvis et al. 2009).

The EU funded projects on the VTS are largely technologically driven and ethnomethodological workplace studies can tremendously benefit these projects; the ethnomethodological approach foregrounds in-situ work and makes technology analysable and can overcome constraints regarding obtaining information from end-users by studying work as a local, situated, embedded and contingent accomplishment, thereby adding value to the design and development of technology which is supportive of work. The fast paced technological developments in the VTS will benefit from an ethnomethodological understanding of how

[24] MarNIS, online at: http://www.transport-research.info/web/projects/project_details.cfm?id=11127

technology features in, and is used to accomplish VTS work. Currently the developments outpace our understanding of in situ work in this area.

The e-Navigation initiative of the IMO (2009) encapsulates both ships and shore based service providers, and calls for the harmonised collection of maritime information – its integration, sharing and exchange, presentation and analysis utilising technology to enhance berth to berth navigation and the provision of related services. Recent VTS research projects such as ACCSEAS[25], MONALISA[26] and MONALISA 2.0[27] have highlighted Sea Traffic Management (STM) through the development of novel e-Navigation solutions for safe and efficient berth to berth navigation, and research has involved studies in simulation environment with test bed regions and integrated novel functionalities such as ‘display of intended route’, ‘shore based route suggestion’, ‘route exchange’, among others (see Bileso 2015).

Further developments in e-Navigation relate to Marine Electronic Highway (MEH) and Fleet Operation Centres (FOC)[28]. The concept of MEH is utilised in the demonstration project of the IMO[29] in the straits of Malacca and Singapore. It aims to link communication facilities of transiting ships to shore based infrastructure of information and communication. The main aims are to enhance service provision and improve the navigation safety, security and environment protection. The marine environmental information is linked to the VTS system and vessel navigational information is also made available. The information sharing and exchange aims to contribute to effective traffic management in the straits utilising the resources of the three littoral states of Singapore, Malaysia and Indonesia. The development of an FOC, enables a shipping company to monitor and track its vessels around the world in real time, with the integration of appropriate hardware and software that give access to data of fleet vessels with respect to nautical data, weather reports, cargo loading information etc. which can aid in providing assistance to ships and undertake trouble shooting, if required.

Ship-shore communication is one of the important aspects of the future developments in the e-Navigation initiative (IMO 2009) and my study contributes to our understanding of ship-shore

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[25] ACCSEAS, online at: http://www.accseas.eu/
[26] MONALISA, online at: http://www.sjofartsverket.se/monalisa
[27] MONALISA 2.0, online at: http://monalisaproject.eu/
[28] FOC example, see: http://www.interschalt.com/software/fleet-operation-center.html
[29] MEH, online at: http://www.imo.org/en/OurWork/Safety/Navigation/Pages/MarineElectronicHighway.aspx

communication, particularly with respect to the communication undertaken on the marine radio and can inform maritime safety.

In this section, I have mapped the academic landscape with respect to the research on the VTS, research projects on the VTS and future developments in the e-Navigation initiative (IMO 2009). In the following section (2.6), I review pertinent ethnographic studies in merchant shipping, including studies on the human element, which helps to contextualise the maritime transportation sector, of which, my study is a part.

2.6 Pertinent Ethnographic Studies in Shipping

Kahveci et al. (2001) explore the *'social dynamics of multinational crewing aboard merchant vessels'*. In order to study the *'Transnational Seafarer Communities'*, the researchers went on-board, lived alongside the crew and utilised a combination of observation and interview techniques for the purpose of data collection. Even though the research project did not exclusively focus on language and communication, it came across as a 'critical issue' with respect to multinational crews. The researchers recommend that 'high levels of fluency' in the working language of the ship be ensured across all ranks on-board to enhance solidarity, improve working relationships and to enable the crew to partake in social interaction involving jokes and storytelling which are key elements of social life on-board. The working language of a ship can be English or any other language which is established as the common language on-board. The working language of a ship is to be differentiated from the language used by the ship for external communication with other ships, port and other shore based authorities. Ships transit international waters across several time zones and visit ports in different countries; to standardise international communication in shipping and enhance safety, English has officially been recognised as the language of operation at sea (IMO 1978, 2010 as amended, 2000, 2002a).

A study by Sampson and Zhao (2003) on *'multilingual crews: communication and the operation of ships'* highlights the importance of communication and language in a multinational shipboard setting. The context of a sailing ship provided the researchers with the opportunity of observing both work and social relations at sea including issues related to communication and language on-board. Their study is based on the research for the project on 'Transnational Seafarer Communities' by Kahveci et al. (2001) mentioned above. Their findings show that an uneasy environment of mistrust and suspicion is created when some members of the crew talk in their first language in the presence of crew members from another nationality, and that, the lack of trust and suspicion mar solidarity on-board. The research findings highlight the various communication problems related to both work and social life on-board merchant ships. The communication problems on-board were largely caused by misunderstandings, miscommunication, misinterpretation, refusal to speak in English, reluctance to admit to one's lack of proficiency in English and even avoiding joking and participating in social banter with fellow seafarers. The researchers found that *the use of Maritime English was not witnessed on any of the vessels that the researchers sailed upon,* including in ship-shore communication (Sampson and Zhao 2000, p. 37-38). I argue that Sampson and Zhao (2003) worked with a very narrow definition of Maritime English, limiting it to the formulaic phraseology of the SMCP (IMO, 2002b) and this adequately explains and accounts for their finding that they did not witness the use of maritime English on-board even in ship-shore communication.

A study by Bailey et al. (2006) focuses on talk and interaction amongst members of the bridge team who are engaged in the practical task of navigating a vessel. The study empirically analyses interactive talk utilising principles of *ethnomethodologically informed conversation analysis*. For the purpose of this study, data was gathered by a single video recording and the field notes of the researcher present on the bridge. The researchers found a *confirmatory form of talk* which oriented all listeners towards a shared perspective. However, the polite *confirmatory form* of talk was done away with at the time of navigational stress, requiring repair and re-alignment to defuse the tension on the bridge and carry on work as a team.

Froholdt (2010) analysed a single transcript of a telephone conversation between the master on-board a ship and the shore based manager in an emergency situation. She utilised interpretive discursive psychology, conversation analysis and Wittgenstein's (1953) philosophy in the study. She makes salient the deployment of emotion displays in the management of accountability. In the analysis, she revisits the context of the situation in which the interaction took place and argues against the use of traditional functionalist approaches to culture in analysing human error. She argues that such an analysis reveals the contextual sense meaning that goes on and that culture should not be taken as a fixed given category (also see Pyne and Koester 2005; Knudsen and Froholdt 2009).

Grøn and Svendsen (2013) conducted ethnographic research on-board four Danish international ships from an anthropological perspective. The researchers observe that a fallout of the increasing global neoliberal world order in crewing merchant ships is that, seafarers *"seldom are members of the same group two voyages in a row and must cooperate with seafarers from many countries"* for the duration of the contract (see Lane 1996; Kahveci et al. 2001; Sampson and Schroeder 2006; Progoulaki and Roe 2011). The researchers owe their allegiance to the discipline of anthropology and regard crewmembers on-board merchant ships as "blue" social capital. The researchers further argue that the challenges faced by crewmembers on-board merchant ships have the potential to fragmentize the social capital on-board. The researchers suggest a balance between *bonding, bridging* and *linking* to restore the fragmentized social capital by promoting horizontal and vertical linkages between the crew members on board and between the crew and the company ashore to contribute to enhanced cooperation and work performance. The researchers conclude that, *"a large and well-balanced stock of 'blue' social capital can increase psychological well-being, safety, work performance and, ultimately, economic performance"* (2013, p. 211).

Ethnographic studies aboard ships have largely ignored in situ work and communication as the primary focus of research inquiry. *In the shadow of freedom: life on-board the oil tanker* by Mira Karjalainen (2007) is an ethnography of work and life on-board Finnish oil tankers (also see Stanley 2007; Howard 2008b). Shipboard ethnographic research has largely focussed on life (Kahveci et al. 2001), transnationalism (Sampson 2013), work (Vigue-Camus 1999), issues of gender (Safilios-Rothschild 1978; White et al. 2001; Van et al. 2008), and the indoctrination and socialization of new sailors (Bourassa and Ashforth 1998) etc.

Language and communication have also been studied quantitatively in shipping. John et al. (2013) analysed the transcript from the voyage data recorder of *Cosco Busan's* collision with the San Francisco Bay Bridge and developed a quantitative index to measure flow of information within bridge team communication. They calculated the Individual Communication Index (ICI) for each speaker by dividing the number of words for speaker in time segment plus number of content words in a time segment plus the number of SMCP keywords in a time segment by the total word count (ICI = Ns+Nsc+Nsk/N)[30]. They argue that a higher value of accumulated ICI implies better team communication. This study strips the bridge team communication by segregating content words from functional words. Such segregation is carried out on the basis of utilising the IMO SMCP (2000) as a benchmark and research has shown that IMO SMCP is not used as intended in the workplace (Sampson and Zhao 2003). The practical reality of training individuals to only use functional words in the workplace is beyond the scope of the study. John et al. (2013) is in complete contrast with Nevile's (2004) aviation study in which he demonstrates how pilots use non-prescribed forms to accomplish tasks in the cockpit. Froholdt (2011) also showed the in situ formulations of the read back to achieve contextual sense-making in her communication research between the ship and land-based traffic. A quantitative approach to studying in situ interaction is inadequate and completely at odds with the ethnomethodologically informed workplace study design carried out in my research work.

In the next sub-section, I provide a brief overview of research at the Seafarers International Research Centre (SIRC) that has not been covered previously. This brief overview helps position my study in the work of the research centre which is the only one of its kind in the world with an exclusive focus on the human element in shipping.

2.6.1 Research at SIRC

SIRC has an enviable reputation when it comes to research on seafarers' life and work; it makes an invaluable contribution to the discipline of sociology and the maritime industry by virtue of its research focus. Dr. Helen Sampson, Director of SIRC, won the 'best ethnography' award for her multi-sited ethnography titled, *International seafarers and transnationalism in the 21st century* (Sampson 2013).

Vulnerability of seafarers is demonstrated by Walters and Bailey (2013), who argue that the precarious position of seafarers is largely due to the international regulatory regime and the structure of seafarer employment. The authors argue that the situation is likely to remain

[30] N= total word count of all speakers in a time segment. Ns= given speaker's word count Nsc= given speaker's content words. Nsk= given speaker's SMCP key words. John et al., 2013, p. 237).

unchanged as long as profits continue to be prioritised over safety in the neoliberal world order of global shipping and unless regulations are enforced more robustly.

The IMO adopted its *'human element vision'* in 1997 (resolution A. 850 (20)). The principles and goals of the human element vision placed the seafarer firmly in the centre and the IMO invited member governments to take into account the principles of the human element in decision making in shipping. SIRC is at the forefront of conducting research in the human element in shipping. SIRC has researched several areas that touch upon seafarers' life and work at sea: education and training (Sampson 2004b), environmental regulations (Bloor et al. 2013a), family life (Sampson 2005; Thomas and Bailey 2006, 2009), health and safety (Bloor 2011; Bhattacharya 2013), labour market issues (Winchester and Bailey 2012), multinational crews (Kahveci et al. 2001; Kahveci and Nichols 2006; Acejo 2012), regulation (Sampson and Bloor 2007; Bloor et al. 2013b), research methods (Sampson and Thomas 2003; Belousov et al. 2007), social isolation (Sampson and Wu 2003), impact of globalisation (Bailey and Wichester 2012), technology (Gekara et al. 2011), women seafarers (Thomas 2004) etc.

The research cited above is not a comprehensive list of the work carried out at SIRC, but is indicative of the areas it covers with respect to shipping and seafarers. SIRC largely focuses on seafarers and not on shore based workers in shipping. A clear gap in the research at SIRC is that hitherto no research has been conducted in the VTS work setting and none has looked at ship-shore communication thus far and my study makes good this need. VTS operators are usually former seafarers who take up the traffic monitoring role upon coming ashore and my research is timely, topical and adds to the portfolio of research done at SIRC.
In the following section (2.7), I justify the eclectic epistemological approach adopted in this thesis.

2.7 Justification of Epistemology

This study is informed by ethnomethodological studies of work; it draws upon ethnomethodology, interactionism and related ideas to explore in situ work, its inherent challenges and the interaction order.

The eclectic approach adopted in the thesis is grounded in ethnomethodological workplace studies and Rawls' (1989b) elucidation of the interaction order that draws upon the works of Goffman, Garfinkel and Sacks. In this approach of the interaction order, the interactional commitment of members shapes the social self; highlights the intelligibility and reflexivity of meaning, and the indexicality and accountability of action that together serve to accomplish in situ institutional work. Rawls' (1989b) explication of the interaction order are compatible with the research interest of exploring the work of VTS operators and the port interaction order and justifies the adoption of the broad eclectic approach.

The methodology utilised in workplace studies is ethnomethodology, conversation analysis and ethnography (see Arminen 2001). Studies have previously combined ethnography with conversation analysis; Bailey et al. (2006) researched interaction on a ship's bridge and combined ethnography with ethnomethodologically informed conversation analysis to explore bridge team interaction. In the study of Thai talk, Moerman (1988 (1996 edition), p. X in Preface) observes that *conversation analysis can seem bloodless, impersonal and unimportant* for the concerns of anthropology. I approach my research from within the discipline of Sociology, and consider conversation analysis to be an extremely valuable method. However, it is unsuitable for my study given the time and resource constraints and as its overtly micro analytic focus would limit me in the scope of my research and would not do justice to my work site. Time and resource constraints apart, the limited perspective offered by conversation analysis would not allow me to explore and capture the inherent complexity of the practical achievement of navigation in the complex space of the harbour (see Atkinson et al. 2008). My main research focus is the in situ accomplishment of work and the interaction order in the VTS and not the exploration of structures of talk (see Psathas, 1995b). My research is not envisioned in the conversation analysis tradition; however, my research draws upon verbatim transcripts of interaction on the VHF Radio and in several instances utilises transcription conventions of conversation analysis to highlight important features of talk.

Atkinson (1988, p. 441), acknowledges that ethnomethodology has made a positive contribution to sociological theory and empirical investigations but critiques it, saying that –

> …some contemporary versions of EM-conversation analysis in particular-have an unduly restricted perspective. They give rise to a sociology which is behaviourist and empiricist, and which does not reflect the interpretative origins that inspired EM.

Atkinson (1988, p. 449) further states that –

> In drawing on both Parsons and Schutz, Garfinkel's early inspiration was to reject the judgemental dope image in order to focus attention on the skilful and artful, methodical work put into the production of social order. In the intervening years, however, some versions of ethnomethodology have returned to the judgemental dope as their model actor.

Atkinson et al. (2008, p. 217) argue for a *multi-modal complex ethnography* to remain faithful to the complexity of social life. *They call for an ethnographic analysis that is identical to its local production as well as its wider systems of signification* by exploring multiple meaning-making modes in the research. Ethnomethodologically informed ethnography has been regarded as an important development by Silverman (1985) who drew upon Dingwall (1981; see Atkinson 1988; Pollner and Emerson 2007). In line with the studies discussed above, I justify my choice of an ethnographic study that draws upon interactionism and related ideas for my study, as the design offers a good fit with the research focus.

I utilise an ethnographic research design inspired by ethnomethodology to explore interaction on the port VHF radio, however my study cannot be categorised as an *ethnography of speaking* or an *ethnography of communication* as my empirical findings are not organised as descriptions of the *speech community, communicative competence, communicative situation, communicative event*, *communicative acts* etc. and my allegiance is not to the disciplines of linguistics or socio-linguistics but to sociology (see Gumperz and Hymes 1964; Saville-Troike 1982; 1986; Bauman and Sherzer 1989).

I draw upon the interactionist perspective as individuals interact with one another utilising language and interactionism eschews grand theorising and prefers experience near research (Denzin 2004; Rock 2007). I draw upon ethnomethodology to explore how harbour/ fairway navigation is achieved by the participants in situ. I have taken into cognizance the similarities and the dissimilarities of the two sociological perspectives and draw upon them to nuance the findings. I am not dogmatic on theory (Becker 1993) and Feyerabend (1975, p. 2) speaks to me when he says –

> I want to defend Society and its inhabitants from all ideologies, science included. All ideologies must be seen in perspective. One must not take them too seriously. One must read them like fairy tales which have lots of interesting things to say but which also contain wicked lies, or like ethical prescriptions which may be useful rules of thumb but which are deadly when followed to the letter.

Law (2006) argues that the *world is largely messy* and therefore the methods required to study it, need to be messy as well. I argue in the ethnomethodological vein that the world is orderly, and believe that in the first instance, to the uninitiated it may give the appearance of being messy, however on closer exploration, order is discernible. Unique adequacy (Garfinkel 2002) guards against the shock experienced by a researcher in the field who might think upfront that everything is messy as the researcher is unfamiliar and has no knowledge of the area. However, I argue that such deep immersion may not always be possible for some specialist fields. Nevile (2004) did not learn how to fly a plane but his research in the airline cockpit as a nonparticipant observer was seminal. In my case, I thoroughly prepared myself for the fieldwork before I went on to conduct the main study (see chapter 3 on methods). I argue that this was a suitable way to approach the research problem, otherwise the discipline would have had to wait for a VTS operator to turn sociologist before such research could have been conducted. I agree that mixing methods is appropriate for research purposes, not for triangulation alone (Flick 2007), but to reveal facets about the study otherwise inaccessible by a particular method (Denzin and Lincoln 2005). I have drawn upon *ethnomethodology, interactionism, dramaturgy* and *conversation analysis* where required, to nuance the findings.

I am with Law (2006, p. 3) when he argues for the messiness of method instead of methodological hygiene that comes across as a dictat –

> Eat your epistemological greens. Wash your hands after mixing with the real world. Then you will lead the good research life. Your data will be clean. Your findings warrantable. The product you will produce will be pure. Guaranteed to have a long shelf life.

According to Blumer (1969), *'reality exists in the empirical world'* and does not reside *'in the methods used to study that world'*. Reality is to be discovered in the examination of the social.

> Methods are mere instruments designed to identify and analyse the obdurate character of the empirical world, and as such their value exists only in the suitability in enabling this task to be done (Blumer 1969, p. 27).

In this section I have justified my epistemological stance of conducting an ethnomethodological study of work; drawing upon ethnomethodology, interactionism and related ideas. The following section concludes the chapter.

2.8 Conclusion

The ethnomethodological programme of workplace studies, brings work into the foreground and makes it analysable. The artefacts, resources and technology that feature in the work are made analysable and work is studied as a local, situated, embedded, embodied and contingent accomplishment. Within workplace studies, the VTS has hitherto not been covered while other *centres of coordination* have been covered like the ATC, operations room of airlines, underground rail control centres, emergency dispatch centres etc. These studies include the exploration of the cooperation and collaboration between spatially distributed personnel with the aid of available technology and have used a combination of ethnomethodology, ethnography and conversation analysis.

The studies highlight that the (in)adequacy of technological support can be aptly gauged through workplace studies and the results can serve to inform future design of supportive technical systems. The studies exploring institutional talk utilising conversation analysis in a particular setting, highlight the nuances of turn taking, sequences, speech exchange systems, the accomplishment of institutional identity and knowledge distribution, among others. The studies of mediated communication, highlight the shaping and adaption of interaction according to the affordances of the technology and how technology both shapes and is a feature of in situ work.

The review of literature on the VTS has shown that more research effort is concentrated on the technical issues in the VTS – be it on the individual components of the decision support system, the VTS system itself or the utilisation of fuzzy logic and mathematical modelling to make predictions about traffic behaviour and throughput. Qualitative research in the VTS has largely been approached from the perspective of human factors/ergonomics and most research has used simulation and interviews, observations and/or focus groups (Brödje et al. 2010; 2011; Praetorius 2012; Praetorius et al. 2012; 2013). Even when the work of the VTS operators is explored, it is done with the help of simulation. The accomplishment of work in situ is left unaddressed.

The only micro analytic study in monitoring marine traffic is Froholdt (2011) [31] and together with Bailey et al. (2006) are the only two studies utilising ethnomethodologically informed conversation analysis in shipping. Froholdt (2011) locates her study in the discipline of human factors and utilises ethnomethodology, conversation analysis and discursive psychology. As previously reviewed Froholdt (2011) discusses the confirmatory form of talk (see Bailey et al. 2006) and its re-formulations. She also discusses rule-following in making a VHF call, truncated actions as a feature of radio interaction and the use of 'over' as a discursive resource. Froholdt's (2011) research findings, though useful, do not encompass the management and accomplishment of marine traffic coordination from a shore based centre. In this respect my research significantly adds to the literature on the VTS. My research is based largely upon the naturally occurring interaction on the VHF radio and utilises principles of conversation analysis to nuance select findings, and in this respect my research also contributes to the limited micro analytic studies in shipping.

The need for research in the VTS has been established in chapter 1 – 'introduction', wherein select accidents in the VTS area were discussed prompting the research interest – *how is routine work accomplished by the VTS?* The assumption being that accidents are anomalies and hence the exploration of routine in situ accomplishment of harbour/channel navigation would reveal insights about the inherent *immortal order* in the VTS (Garfinkel 1967, 2011 edition, 2002, 2006). The review of literature suggests that there is a gap in the knowledge regarding the work of VTS operators, the port interaction order and the challenges they face in the accomplishment of institutional work. My main research interest is unpacking the fine grained taken-for-granted practices that *are* the work of the VTS operators together with the port interaction order.

The research questions are recapitulated below. They have previously been mentioned in chapter 1, however their rightful place is at the end of chapter 2 after the literature has been reviewed to contribute to the identified gap in the knowledge.

- What is the work of VTS operators?
- How do they work?

[31] Froholdt (2011) does not specify if the research was conducted in a VTS, but refers to it as Land-Based Traffic, which implies that the fieldwork was not conducted in a VTS.

- How is vessel traffic managed?
  - What are the practices, procedures and activities that constitute and facilitate vessel traffic management?
- How is harbour / channel navigation achieved interactionally?
  - What is said, when, to whom, why, how[32] and to what effect in furtherance of the communicative management and accomplishment of harbour/channel navigation?

- What are the challenges, if any, in the work of VTS operators?

The review of literature shows that the study of in situ work and its interaction order to provide a thick description (Geertz 1973) of the haecceities of work has hitherto not been undertaken, and, this is the unique contribution of this thesis.

My research is an ethnographic observational study that draws upon ethnomethodology, interactionism and related ideas to address the research questions. I extensively draw upon ethnomethodology, principles of conversation analysis (Sacks 1989), dramaturgy (Goffman 1959) and symbolic interaction as appropriate (Atkinson and Housley 2003; Denzin 2004). My study on the work of VTS makes it identifiable with ethnomethodological *workplace studies* (Heath et al. 2000; Rawls 2008) and the naturally occurring institutional interaction explored in my research enables me to draw inspiration from studies on *institutional talk* (Drew and Heritage 1992; Schegloff 1992).

My research study focuses on the ordered in situ work in the port VTS office and contributes to the understanding of *social order*, *sociology of work*, *workplace, action*, *organization, language and communication*. Chapter 3 follows which discusses how I went about researching the VTS.

[32] In order to nuance how something is said, I utilise conversation analysis where required.

Chapter 3 Researching the VTS

"You're the lady who has come to listen to the radio"[33]

> It seemed strange to be referred to as the lady who had come to listen to the radio as I had always associated listening to the radio with recreation rather than the business of serious research. And here I was at a UK port, on a site visit to familiarise myself with the VTS workplace and the data I was likely to encounter in my study (field note, 15 Sep 2010).

> The MahaDevi roads were busy in the morning rush-hour. I had felt lucky on successfully hailing a taxi and had seated myself on the back seat. I had given the destination to the driver and believed that he would momentarily drive off to the port where I would begin the day's fieldwork, when suddenly three of the taxi doors opened simultaneously and three individuals got in (two men and a woman). The Taxi was now full with five people in it. I tried to explain that the taxi was taken, when I realised the taxi was already in motion. I thought, *'Oh my God! This is it, I'm being kidnapped!'* No sooner had I panicked, that I calmed down; reassured when I saw that the young woman who had entered beside me, was well dressed and unlikely to do me harm[34]. She gave me a Rs. 5 note in my hand, her share of the taxi fare. I realised then, that three busy office goers had jumped into my taxi in the morning rush hour and all of them would pay their share of the fare and the ride that was to cost me Rs. 20 would now cost me Rs. 5 (field note, 22 Dec 2010)[35].

The above extracts from the field notes hint at the planned nature of the UK port site visit and the chaotic research experience in the Indian port city. The extracts set the tone of the methods chapter; meticulous planning for the research on the one hand and experiences from the field, on the other. The second field note also hints at my concerns with my personal safety – being female and moving about alone conducting research in the Indian port city (see Sampson and Thomas 2003; Bloor et al. 2010).

[33] Port personnel, port C, UK site visit.

[34] 'There was nothing alarming about her. Her dress and demeanour came across as that of a reputable employed young woman and the way she presented herself, rested my fears almost instantaneously' (field note, 22 Dec 2010).

[35] 'Reminiscing about the incident later in the day, I realised that the panic I had felt in the initial moments was very real and I had no time to even think of my children and parents (who would wait for me at the accommodation where I would join them every evening after the day's fieldwork)' (field note, 22 Dec 2010).

3.1 Introduction

This chapter pertains to the research methodology, the methods adopted for the study and the conduct of the research itself. The chapter discusses the reflexive choices made at each stage of the design and conduct of the research. The research questions explored in my study have been presented previously in chapters 1 and 2. An ethnographic study design that draws upon ethnomethodological workplace studies, interactionism and related ideas, complements the research questions and facilitates the exploration of the answers. Accordingly the methods employed are a combination of ethnomethodology, ethnography and conversation analysis.

The methods chapter is subdivided into sections; in section 3.2, I discuss the negotiation of access and the evolution of the research from the three site visits in the UK to a pilot study in an Indian port before the commencement of the main study. Section 3.3 discusses the conduct of the research at the main fieldwork site – the VTS office of a major Indian world port. This section also discusses the research techniques utilised for data generation as well as the data analysis and preservation. The probable impact of my gender on my field role is also discussed. I also engage with issues of validity and reliability in my research and the representativeness and generalizability of my sample in a social science context. Section 3.4 focuses on ethics as required by the University academic policy, the British Sociological Association (BSA) as well as the ethical nuances of conducting fieldwork among a group of vulnerable[36] workers (see Walters and Bailey 2013) and section 3.5 concludes the chapter. Section 3.3 follows, in which I discuss the preparation for the research – UK field site visits and the pilot study prior to the conduct of the main study in MahaDevi port in India.

3.2 Research Preparation – Site Visits and the Field Study

The fieldwork for the research was divided into three phases – site visits, pilot study and the main study. Before undertaking research fieldwork in India, I undertook three site visits in the VTS offices of ports in the UK. These site visits were planned to familiarise myself with the space of the VTS office, observe the work of VTS operators, observe the role of technology in their work and identify the data I was most likely to encounter in my study and what I would

[36] The VTS operators cannot be considered vulnerable as they have a secure government job. They have an important safety critical role in the harbour. They have a traffic monitoring and directing role which accords them certain powers. However by virtue of their low rank and status in the port, they can be said to have an air of vulnerability.

need to do to ensure that I appropriately answered my research questions. I did not enter the field sites to fine tune my research questionnaire or the observation guide (see Sampson 2004a), I entered the sites to develop them in the first place and thereafter went on to test them in the pilot study in India and before the main study, also conducted in India. Table 3.1 shows the sequence of the fieldwork and the data obtained from the field.

Table 3. 1: Fieldwork sequence and research engagement

Field work			Duration	Interviews[37]		Audio data
	3 Site visits	1	1 day	3	2 PCO[38]	-
					1 DHM[33]	
		2	1/2 day	3	2 VTSO	-
					1 AHM[33]	
		3	1/2 day	1	1 LPSO[33]	-
	Pilot Study		3 days	8	2 SS[33]	10:40 Hrs
					6 VTSO	
	Main Study		7 days	10	1 S	85:00 Hrs
					1 HM[33]	
					8 VTSO	
	Total		12 days	25		95:40 Hrs

Source: Student

In the UK it was relatively straightforward for me to secure access for the site visits. The port offices responded to emails promptly and suggested dates that would be suitable for my visit. The three site visits were in different cities in the UK and the first visit required substantial travel, for which I stayed overnight in a city en route. The other two site visits required less travelling and I could get back to Cardiff the same day. I had to plan ahead and get help from family to undertake the site visits and subsequent fieldwork. My retired father was requested to come from India and tasked to look after the two children (one child aged 6 years and the other, 6 months) while I carried out my work. The site visits were a positive learning experience. The port officials and the VTS operators were welcoming and spoke to me in detail about their work. In site 1, the VTS office was located at a height, directly overlooking the water, providing a bird's eye view of the port below. Both the VTS operators were in uniform (second mates rank

[37] The interviews in the field site visits were informal and unstructured.

[38] PCO – Port Control Officer, DHM – Deputy Harbour Master, AHM – Assistant Haven Master, LPSO – Local Port Service Operator, SS – Signal Superintendent, S – Supervisor, HM – Harbour Master.

on their shoulders) and took turns to speak to me and speak on the radio. They explained the information displayed on the screens in front of them and the technology being utilised for monitoring and talking to ships. They were receiving input from the AIS, superimposed on electronic charts on one screen; the spreadsheet log of arrivals and departures on another; CCTV footage on three overhead monitors and hydro-meteorological information concerning the tide, wind speed and direction on yet another screen. The VTS operators explained things to me and attended to their screens, took VHF radio calls, answered the telephone[39] and logged details of the ships which had been in radio contact on the spreadsheet. I must have looked impressed at the sheer amount of work being done, as one of them remarks, *"and they say men can't multitask"* (site 1, VTSO 1).

The two VTS operators I interacted with, in site 1, were trained according to the IALA (2005) Model Course V – 103/1 for VTS operators. They were very articulate and said that they were there for navigation safety and protection of the environment. They explained the three services provided by them, namely INS, TOS and NAS and spoke of *situational awareness* as a core component of their work as they needed to be aware of how the current traffic situation would develop over time. I observed the complex nature of the VTS operators' work and asked them questions to seek clarifications when required. The VTS operators were busy monitoring and giving ships permission to sail out or to enter the port. Earlier they had permitted *Emerald Pride* to sail out and as it sailed past, to me it looked like a building sailing by. The bridge team of the ship and the VTS operators waved to each other and I believed that I had witnessed something truly unique to the VTS work setting. I had entered blind into the field (see Sampson 2004a) and this was suitable for my research purpose as I was attempting to get an idea of the preparatory work required of me in terms of the research tools and techniques to do justice to my research questions and the field site. The following field note is illustrative of my visit.

> I was met in the car park by the Deputy Harbour Master as agreed. He was very affable and spoke to me about his career as a pilot…He explained the work of the VTS operators and that nothing in the harbour moves without their permission. He had called the VTS office ahead and they were expecting us, however I knew that even when I had access to the physical site, I would need to secure the permission of the VTS operators to talk

[39] On weekdays the VTS operators do not take telephone calls as the rest of the office staff is present. However my visit was on a weekend when everybody else was off duty apart from the two VTS operators and therefore they were taking telephone calls in addition to their VTS work.

> to them. I was escorted to the VTS office by the Deputy Harbour Master and the first thing that struck me was that indeed it was a long way up…The VTS operators were happy to see me, The Deputy Harbour Master said that they were doing a very good job in the port and joked that the next time he piloted a vessel, he would appreciate it if the VTS operators would let him come in quickly… He left me there for the day and asked the VTS operators to call him once my work was done so that he could escort me back (field note, site 1, 29 Aug 2010).

The first port site I visited catered largely to one type of ship. I undertook two further site visits in the UK to learn if there were differences in catering to different types of ships before moving on to do the pilot study in India. For the second site visit, I took a train to the port city and could not find any taxi to take me to the docks. I started walking and realised that the choice of a business suit and heels was not a good idea. The following field note is illustrative of my visit.

> I hadn't realised it would be such a long walk and I was really worried about getting late for my appointment with the Assistant Haven Master. I was alone on the road for the most part. I felt foolish trekking down the road and I certainly believed that I looked foolish in a business suit and heels. Close to the security checkpoint, I found trucks lined up and felt relieved that I was getting closer. I got directions from the security guard and continued walking. The whole scene around me was huge. I felt dwarfed by the big cargo trucks and the even bigger hills of scrap iron waiting to be loaded onto ships before being taken away. I could see the berths were huge and I genuinely felt out of place and lost. The place struck me as essentially masculine. I was continuing on my silly trek, when an official port car stopped and the driver enquired about the purpose of my visit. I was really lucky to have run into him as he gave me a lift to the port office and spoke to the Assistant Haven Master who was expecting me and joked that if it were not for him, I would have reached the office late in the evening… The Assistant Haven Master asked me about my research, showed me the maps of the port and explained the work they did. After speaking to him for some time, we made our way to the VTS office. I knew from experience that the VTS office would be atop a tall tower, however I was unprepared for the sheer drop to my right. I hastily retreated. He explained that they experienced large variations in tide and in his words they were always, *"constructing the tide"* to accommodate ships. This time around, I was prepared for the technologically saturated VTS office and I made a remark about it to the VTS operators, to which one replied, *"yeah, 1960s science fiction"* (site 2, VTSO 01). The UK was a pioneer in the setting up of VTS systems and to me what looked like complex technology, appeared old to the VTS operators… The VTS operators said that about three fourths of the ships calling at the port required compulsory pilotage. The VTS operators said that they were familiar with the pilots and confident of the pilots' local knowledge, communication and navigation ability and the interaction went smoothly after a pilot had boarded the vessel. However, for smaller ships less than 85 metres in length that do not require a pilot, sometimes communication problems can be experienced as in the case of foreign Masters. The Assistant Haven Master said that it is in such instances when, *"all their V-103 training comes into play"*… (Field note, site 2, 9 Sep 2010).

Like their counterparts in site 1, the VTS operators in site 2 were trained in V-103 and utilised similar technical vocabulary (see MCA 2011). The port, was not busy as it had registered a significant drop in traffic following the 2008 recession. On my third site visit, I went to a port which had recently been downgraded from a VTS to an LPS (Local Port Service) (see MCA 2009) following an assessment. The former VTS operator had taken a pay cut and decided to continue in the job but now he was referred to as a Local Port Service Operator (LPSO). His office was almost on top of the lock gates and provided a good view of ships entering and leaving the port. The traffic being serviced by the third port was much less. They had asked me to visit on that particular day, as after a gap of one week, three ships were calling at the port which would enable me to have the opportunity to listen to the interaction on the radio. The LPSO was helpful and chatted about his work with me.

The three site visits were extremely beneficial, they helped me appreciate the space of the VTS office from where the work is carried out, helped me understand the nature of work of VTS operators, understand the role of technology in the VTS as well as grasp the interrelated work of VTS operators, pilots, tugs, lock gate controllers, berthing and mooring crew etc. Above all, I appreciated that the local situations in each of the ports I had visited were vastly different – from the cargo handled, ships serviced and volume of traffic to the local sea conditions. These conditions shaped the procedures for the management and coordination of traffic. Due to the site visits, I had a fairly good idea of what to expect and how to go about conducting my research in the VTS. Based upon my site visits I had drawn up my interview and observation guides (appendix 7, p. 297 and appendix 8, p. 298) and was ready for the next phase of the fieldwork to be conducted in India. Fieldwork in India was an attractive option, as I could get help from my family for childcare and other local support as required. In contrast to securing access to ports in the UK, India proved to be much more difficult. I had initiated contact with ports in India at the same time as I was negotiating access with UK ports. While the UK site visits were complete, and the six-month old baby was now ten months old, I was still in the process of negotiating access to Indian ports.

The Central Government of India regulates merchant shipping via the Indian Ministry of Shipping. The Directorate General of Shipping, under the Ministry of Shipping is responsible for the implementation of national legislation of IMO resolutions. All the major ports in India come under the Major Port Trusts Act (Govt.of.India 1963) and are headed by senior civil servants – Indian Administrative Service (IAS) officers. The bureaucratic set up of the ports made it difficult to get access to port facilities. I sent letters out to thirteen Indian ports (see appendix 2, p. 291). I did not hear from twelve of them. I heard from one Port, which initially rejected my request outright citing safety and security concerns. I responded stating that I did not want access to anything confidential but only wanted to study the interaction on the radio which was free to air radio broadcast accessible to all attuned listeners in the harbour. Finally, I was able to secure access to the one port I had been trying to convince (Sagar) and another one (MahaDevi) through my personal contacts. It was fortuitous that both these ports are neighbouring ports with adjacent VTSs and Sagar served as the site for the 3 day pilot study. I considered myself well prepared for my pilot study. I had communicated with the Senior Dock Master beforehand, sending him both the project information sheet (appendix 5, p. 295) and the informed consent form (appendix 6, p. 296). I had applied for a port entry permit for myself, the taxi driver and his vehicle. I had submitted our applications with photo identity proofs and had to collect the port entry permit (appendix 4, p. 294) before commencing the pilot study.

> On my first day at the port, the Senior Dock Master, spoke to me at length, gave me the port prospectus and told me about its various berths and the work of VTS operators. He said that he asked the VTS operators to use closed loop communication on the VHF radio for clarity and confirmation…He said that he would ask the VTS operator who had come to the head office, to take me to the VTS inside the port limits. I had asked the taxi driver to wait for me as I was going with a VTS operator, when I was informed that since I had only taken security clearance for myself and not my laptop, I could not take it with me. I had to leave my laptop inside the taxi and ask the driver to take care of it, while hoping that this should not be the last time I would see it…The taxi driver was there when I returned from the day's fieldwork, as was my laptop and it was a day that went well (field note, field study, 17 Dec 2010).

The field study in Sagar port was the connecting transitional link between the UK site visits and the main study in neighbouring MahaDevi port. The two neighbouring Indian ports had adjacent VTSs and a similar organisational structure. The themes revealed in the pilot study were crucial to fine-tuning the instruments and exploring the VTS further in the main study.

The VTS operators I met in Sagar port were very helpful. I had prepared copies of the project information sheet (appendix 5, p. 295) and when I gave each one of them a copy, they stood around me to discuss it in detail. They wanted to ask questions about the research work I was doing and the fellowship programme which had made it possible for me to undertake the study. They were happy to talk to me and were interested in my study. I felt it would be an insult to their generosity to ask them to sign the informed consent form to indicate officially on the *dotted line* that they were willing to talk to me. Signing on official looking papers/documents is regarded with suspicion in some cultures, including in Asia (Christians 2005; Marshall and Rossman 2006) and even though I had prepared an informed consent form (appendix 6, p. 296), I decided against using it and obtained and recorded consent in my field notes. Above all, I was sensitive to the requirements of the VTS operators and to the ethical considerations guiding my study (section 3.4).

The VTS operators took turns to talk to me and encouraged me to seek clarifications. One VTS operator took me around the whole office showing me the whiteboard used to give status updates on the traffic of the port, and I learnt that the direction of the small arrow revealed the direction in which the ship was berthed alongside. I learned that they went through the berthing schedule for the day to prepare themselves prior to talking on the VHF. I was shown the logs they maintained by hand (one continuous running log and separate logs for each of the individual terminals in the port). I was taken to the recording room and saw the equipment which records the interaction on the VHF channel of the port. I was also shown the roof of the VTS office, from where I could take pictures (for going along as a research tool, see, Kusenbach 2003).

Sagar port mostly accommodates deep draft vessels that take advantage of the high tide[40] to enter the port and during my field study most of the vessel movements took place late at night after I left the office or in the early hours of the morning before I reported for the study. This meant that I was missing a lot of the action in terms of vessel movements and with it, the opportunity to record interaction on the radio. However, this gave the VTS operators ample time to speak to me about their work. They even commented that it had been surprisingly quiet, otherwise they would have been very busy taking calls and wouldn't have had the time to explain things or answer any of my questions.

During the field study, I realised that the observation guide and the interview tool I had designed on the basis of the UK site visits needed to be tweaked in the Indian context, as the Indian VTSOs had not received training similar to their UK counterparts and therefore some

[40] During the course of my fieldwork, according to the tide table, the high tide was coming late at night and in the early hours of the morning.

questions were unintelligible to them. The VTS operators in Sagar port were unaware of the terminology of the services they were providing – INS, TOS and NAS, they were not trained in Maritime English and had not heard of the Standard Maritime Communication Phrases (SMCP) (IMO 2002b). Most of them were ex-defence personnel and had been trained in radio telephony from the Signals corps of the forces. They were highly experienced and had received on-the-job training. Some of them had even gone abroad to train with the company that had installed the VTS system. However, the training received was not the V-103 (IALA 2005) as known in Europe. Their training had largely focused on the procedures of radio telephony and the use of the VTS equipment.

Several themes emerged with respect to their work – the task/purpose/context of the communication was linked to the name of the vessel. The moment VTS operators heard the name of the vessel, they would know the direction the interaction was likely to take. The VTS operators were concerned about the unregulated use of VHF technology and abuse of the radio channels[41]. They had experienced language and communication problems with seafarers from China and the Far East and they overcame problematic communication by repeating, speaking slowly, and using phonetics for spelling to facilitate clear communication.

> With respect to the language used in the daily VHF communication on the radio, they said that they used *'plain, simple and normal English'*. They said that no one talked in code and by the code they did not mean Maritime English or the SMCP, but showed me a book titled the International Code of Signals (1969, revised 1981; US edition publication number 102) (field note, field study, 18 Dec 2010).

Initially the Senior Dock Master only gave me permission for a two day visit for the pilot study but I was able to get it extended by another day. He felt that there wasn't much to see in the VTS. Research ethics were mentioned when he said that he wouldn't want me to write anything bad about them and he also added that he would want me to use the data for the purpose for which it was collected and I was made aware of the responsibility of the ethical conduct of my research (see section 3.4 on research ethics). A pilot study has been referred to as invaluable

[41] Unregulated and unrestricted use of the VHF points to the easy availability of VHF sets in the market from secondary sources like the VHF equipment sold from a ship being scrapped, on which the seller programs the marine channels for the buyer. What the VTS operators feel is that the main working channel for the ports should not be programmed on the handsets of such users. However since there is no regulation governing the sale and programming of VHF sets, this trend is likely to continue.

by Sampson (2004a) and my pilot study was crucial to make a successful transition to the main study from the UK site visits. I had fine-tuned my research tools, I had tested my equipment and was ready for the main study in MahaDevi port. The VTS operators of Sagar port had colleagues in the neighbouring MahaDevi port and they gave me contact details of a colleague working in the MahaDevi VTS Department who could help me with my data collection. They wished me well and I said my goodbyes grateful for their help and support.

3.3 The Main Study

After four months of negotiating access, I got access to the MahaDevi port for the main study with the help of my personal contacts. The choice of sample requires careful thought and planning and the case needs to be well chosen in qualitative research of a case. MahaDevi is one of 13 major Indian ports, it has 24 hour operations with continuous traffic movement[42], services all vessel types and handles diverse cargo and can be considered an ideal field site. It was fortuitous that after months of trying, I got access to MahaDevi port VTS office. It can be considered a "critical case" (Goldthorpe et al. 1968) for major Indian seaports (also see Stake 2005). The informed case selection addresses the charge of representativeness levelled against case studies (Punch 1998; also see Merkens 2004). The major Indian ports are headed by senior civil servants, have a similar organisational structure and training and recruitment policies. Local geographical and sea conditions apart, the major ports have a lot in common and in this respect, analytic generalisation and extrapolating findings from MahaDevi would be very useful and contribute to our understanding of work, training, recruitment, VTS technology, services and operations in other major Indian ports (see 'extended case method', Burawoy 1998, for extrapolating findings of Zambianisation from copper mines). The sample had also been chosen keeping in mind optimal data generation (Sampson and Thomas 2003). Purposely, I wanted a busy port to record enough real time interaction on the marine radio for my study relatively quickly. I had chosen the sample to maximise the potential for data generation and was fortunate to secure access to the port of my choice. I was able to generate and record sufficient data in the weeks' time that I was permitted for conducting my fieldwork in MahaDevi.

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[42] Apart from the deep draft vessels that use the tidal window to come in.

3.3.1 Gaining Entry

The hierarchical setting of the port office was demanding for my research. I had been granted permission by the Chairman of the Port Trust and was armed with a dock entry permit (appendix 4, p. 294), however, I found that the negotiation and re-negotiation of access *was something of a full-time occupation* in the research (Sampson and Thomas 2003, p. 173). I went through several gatekeepers in the port head office before I was even allowed to physically enter the port limits. The key gatekeepers I met before I was even allowed to enter the port were – the Chairman of the port, the port Deputy Conservator and the Harbour Master and in the end I found myself at the Dock Master’s door.

> The Dock Master was clearly irritated by my presence. He spoke loudly to his colleague but evidently for my benefit, indirectly directing his irritation at me. Standing there with a small polite smile on my face[43], my thoughts first ran to the harsh unwelcome reception faced by the researcher on-board the merchant ship in Sampson’s and Zhao’s[44] research and just as swiftly my thoughts raced to Shakespeare’s heroin Viola[45] who had avowed to stay put at the gate until her foot took root and grew into a tree or until she was allowed to meet the lady of the house to profess her Master’s love. Like Viola, I wasn’t going anywhere until I got the access I needed. The difficulty of gaining access up to the point where I had been standing was not lost on me. I knew that I had to withstand the barrage, (re)negotiate access with this crucial gatekeeper and carry on with my work. A lot was at stake (field note, 21 Dec 2010).

> **Malvolio –** Has been told so; and he says, he'll stand at your door like a sheriff's post, and be the supporter to a bench, but he'll speak with you (Malvolio to Olivia about Viola’s (disguised as Caesario) insistence on speaking with her) (Shakespeare 1623 (1821 Edition) Twelfth Night, Act I, Scene V, p.367).

Access to the VTS office for the main study had taken a lot of effort to negotiate and I was not about to throw it away because of an unwelcoming gatekeeper. In this aspect, I believe that some form of abuse unfortunately ends up being tolerated in course of field work (see Bloor et al. 2010). In the context of access, it felt as if I were constantly jumping through hoops. I negotiated several hierarchical layers of gatekeepers before I entered the sanctum sanctorum of the VTS office in the port (see Wolff 2004).

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[43] See, Hochschild (2003)
[44] Sampson and Zhao (2003)
[45] Disguised as a man - Caesario to woo Olivia on behalf of Duke Orsino. Shakespeare, 1623 (1821 Edition).

> Negotiating access had been tricky and required concerted effort, however once inside the VTS office, the VTS operators were happy to talk to me and explain their work. It appeared as if the deities (VTS operators) in the sanctum sanctorum were happy to see the laity, while the layers of gatekeepers guarded the sacred temple. I was welcomed wholeheartedly by the VTS operators, however I was aware that I had to establish working relationships and move ahead quickly with my research…On the first day of fieldwork, I was accompanied by an official from head office, who was tasked with showing me the place, introducing me to all concerned and settling me down in the sense that I would not disturb the work that was being undertaken in the VTS office. He told me that if I had any doubts, I could ask one of the VTS operators pointed out by him. I was told that one operator would work and I could speak to the other. It was only after he left that I began to establish working relationships with the VTS operators (field note, 21 Dec 2010).

After the port official left, I began to settle down and get my bearings, when a telephone call came through to the VTS office and I was the subject of the call. It appeared as if the port office wanted to ensure that I was helped in my research while at the same time ensuring that I would not disturb work in the office. The following field notes are illustrative –

> The telephone rang and I heard the VTS operator confirm that I was there in the office and the research was taking place on ship-shore communication. He further went on to add that there would be no problem as Madhav[46], the other VTS operator was there to guide me in my work (field note, 21 Dec 2010).

> I was conscious that I needed to justify my presence in the VTS office through my conduct. I needed to be very polite and not intrusive. On the first day of my fieldwork, I was under scrutiny, not by the VTS operators but by the senior port officials and I would have to tread carefully (field note, 21 Dec 2010).

> Access may need to be secured through gatekeepers, but it will also have to be negotiated and renegotiated with the people being studied; ... access cannot be assumed to be available automatically, relations will have to be established, and identities co–constructed (Hammersley and Atkinson 2007, p.4).

A VTS operator, who was not working at the station was asked to show me the VTS system and explain the work being undertaken. I sat alongside, gave him a copy of the information sheet of my research and discussed my work with him and clarified any questions he had. As in the pilot study, I obtained and recorded consent in the field notes.

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[46] Pseudonym for the VTS operator.

> I answered any questions he had and clarified information for him. He asked me about the Nippon foundation…I asked if I wasn't disturbing him and he answered that there was 'no problem'. Talking to him was useful in rapport building for my field work (field note, 21 Dec 2010).

I took rapport building with the VTS operator(s) slowly and seriously. On the one hand I did not want to give cause for concern to the senior port officials and jeopardise my research, while on the other I did not want to disturb the safety critical work being undertaken in the office. In the interest of ethics and sound research conduct, I did not speak to the VTS operator manning the main work station, unless he was free or spoke to me of his own accord to explain the traffic situation in the port and clarify some of the interaction on the VHF radio. The Dock Master briefly entered the office to check on me and the VTS operators. The following field note discusses his visit.

> The Dock Master entered and asked the VTS operators, who was guiding me. I responded that the VTS operator was very busy so I did not disturb him. The Dock Master approved of my answer and said that he had been trying to say the same thing that the VTS operators are very busy and should not be disturbed. He approved when I said that I would ask a few questions when it would be alright (field note, 21 Dec 2010).

The Dock Master approved of my answers. My conduct in the VTS office demonstrated my sensitivity towards the VTS operators and their work. I was able to communicate my earnestness to the Dock Master, who was amiable to me thereafter. Due to my conduct, I was able to win over a crucial gatekeeper, who was also the immediate boss of the VTS operators. Sometimes *access bordering on trespass* can be given to researchers (see Warren 1981, p. 18) One VTS operator offered that I could eat my lunch in the operators' room and the other VTS operator present, said, "no". Even though the offer had been made in good faith, I could not take it up as reservations had been expressed by one and in order to enter the room, I would need to take the permission of the other two VTS operators on duty that day. I politely declined the offer. I did not require access to the personal recreational space of the VTS operators for my research. It would have been unethical of me to take up the offer as the VTS operators rested in this room when they were not taking VHF radio calls. I felt that I would alienate the Dock Master by visiting the VTS operators in their personal space. This was similar to Delamont's (see Atkinson et al. 2008) decision to not join the capoeira students after lessons in their free time. As a married mother of two, visiting the operators' resting room would jeopardise my impression management with the senior port officials and therefore I did not consider it.

The port maintained a 24 hour shift and four VTS operators reported for duty each morning at 7 am. The shift structure enabled me to conduct 8 interviews in the space of two days as well as several informal conversations throughout the day. I had established friendly relations with the VTS operators and they wanted to help me out. The VTS operators would ask their colleagues to talk to me about the technology behind the system, the individual technical components of the system like the VHF radio, radar, ECDIS and the AIS. They also wanted to compare the work they did in terms of monitoring and coordinating the traffic in their port versus traffic handled in other Indian ports or international ports like Singapore etc. The VTS operators wholeheartedly supported my research and recruited colleagues to talk to me.

Figure 3. 1: Panning the screen: VTSO - "It is six nautical miles, so you can change it"

Source: Student (picture taken and used with permission and appropriately anonymised)

Figure 3. 2: VTSO pointing out an outbound vessel

Source: Student (picture taken and used with permission and appropriately anonymised)

3.3.2 Data Generation – Recording VHF Interaction, Observations and Interviews

In order to obtain data to answer my research questions, I identified three data sources complementing my research focus. The audio recording of the *naturally occurring* interaction on the VHF radio was a key data source (see Silverman 2006b, p. 201-240). The VHF radio interaction was supplemented by observations, semi-structured qualitative research interviews as well as unstructured interviews.

Hardware and software in the VTS is exclusively designed for institutional, industrial usage and the recording media does not work on any equipment available in the open market. Due to my site visits, I was prepared for this eventuality, and had procured an Olympus DS-50 Digital voice recorder to record the VHF interaction. I was granted permission and placed the digital recorder close to the VHF radio set from where the VTS operator was talking to ships and the pilots. The recorder picked up more than the interaction on the marine radio. On a single audio track it recorded the conversation between VTS operators and ships, internal communication (from another VHF set placed close by) between the Dock Master's office, pilots, pilot launches etc. It also recorded telephone calls, the squeaky office door and conversations between people in the office[47] and the hum of the air conditioner and other electronic equipment. The audio became quite crowded with overlapping talk and it was difficult to hear and/or transcribe what was being said. Interaction between the VTS operators, ships and pilots was my primary concern. In order to minimise the other sounds/noise/interaction the digital recorder was capturing, I needed an alternative location for my recorder. I met the individual responsible for the technical aspects of the VTS system on the morning of the third day of my field work and took permission from him to place my recorder in the room where the actual recording was taking place. The recording room was full of what appeared to be huge metal cupboards with glass doors, full of electronic circuitry. The equipment was as tall as the roof and each piece of equipment recorded the interaction on a particular channel. Interaction on several radio channels was being simultaneously recorded. The volume of channel 15, the main channel of MahaDevi port, was turned up and my recorder placed next to it. This meant that thereafter my digital recorder would exclusively capture the recording of the conversation on

[47] I had secured permission to place my recorder next to the VHF set and even though the VTS operators walked out of the office to attend to personal mobile telephone calls, I decided to move the recorder in the interest of ethics, so that I would not inadvertently record data which was not in line with my research purpose, for example conversations between pilots as they would walk into the VTS office to submit their pilotage reports. Moving my recorder was also a sound decision for data collection.

channel 15 between VTS operators, ships and pilots and there would be no more disturbance from other sources of sound/noise and I could leave my recorder overnight in the room to capture data continuously. This was helpful as the recording was capturing the data I needed. However this also meant that I was separated from the only digital recorder I had. This had implications for my interviews and discussions with VTS operators as I could not record them, but needed to take notes instead. For the first two days of my 9a.m. to 5p.m. field work in the VTS office, my interaction with the VTS operators was recorded as the digital recorder had been placed inside the VTS office. However after the morning of the third day I began to leave the recorder overnight in the VTS office to capture around the clock interaction on the VHF radio and I would enter the recording room each morning to change the set of batteries which would keep the recorder going for another 24 hours.

> The VTSOs would talk to me when not answering the VHF and/or telephone calls. They would tell me about the traffic plans/schedule/movement; which ships they had asked to come in etc. They clarified any questions I had and showed me the location of the ships they were interacting with on their screens. I would talk to them about the goings-on and they would point things out to me. This helped me to understand that the entire traffic situation which was on their screens was being verbally communicated to parties in the vicinity. In effect they were painting a word picture of the traffic situation. I became familiar with their user interface – I could see the ships on the screen, the important locations in the channel, the anchorages marked on the screen, the dumping grounds, wrecks, the position of buoys etc. (field note, 23 Dec 2010).

Without my digital recorder near me, I relied extensively on taking notes of observations and interviews/discussions with the research participants. I always had a notebook and pen in hand. On one occasion I met the Dock Master just outside the VTS office while trying to watch the traffic in the channel through the big glass windows of an adjacent room, when he asked me questions about my research and what I was trying to find out. I launched into a monologue about the themes I was exploring, when he said –

> DM – "Have you written this down somewhere or are you speaking from the top of your head?"
>
> I realised then that my notebook and pen gave me credibility - I looked like a research student conducting serious research and without it, I ran the risk of coming across as unprepared and uninformed. This was different from Brewer's[48] research in which he

[48] Brewer 1991, p. 21 cited in Hammersley and Atkinson, 2007, p. 25.

> was shouted at by the police constable for his *bloody notebook* while I ran the risk of appearing non-serious without mine (field note, 24 Dec 2010).

I conducted semi-structured qualitative interviews (see interview guide, appendix 7, p. 297) with the VTS operators as well as unstructured interviews in the form of discussions (Warren 2001; Hopf 2004a). I kept my interview guide to hand, however I did not get to finish the interview in one go. This was because the dynamic real time interaction on the VHF radio coupled with the ethnomethodological research focus required me to pay attention to the interaction that was taking place on the radio in real time. This meant that the VHF interaction took precedence and guided the pace of the interviews. The interview would be interspersed with discussions pertaining to what was happening in the fairway and on the radio before getting back to the interview.

I also undertook observations which I noted down in my notebook and expanded on further in the evening after returning from the day's fieldwork (see Lüders 2004). Field notes are considered *selective, descriptive and reductive representations*. However I utilised my field notes for reflexively engaging with the data and the research process along with providing descriptive accounts thereby going beyond their theoretical character (Silverman 2006a).

> …..while field notes inevitably provide selective and partial reductions of these lived and observed realities, they fix those realities in examinable forms, that is, in written texts that can be read, considered, selected, and rewritten in order to produce polished ethnographic analysis and monographs. But in contrast to these finished texts, original field notes of unruly, in-process writings: produced in the initial versions solely or primarily for the ethnographer … (Emerson et al. 2007, p. 365).

Atkinson and Coffey (2001) argue for revisiting the relationship between participant observation and interviewing. They suggest that observations can reveal information that is not obtained by the interview process. In my research utilisation of multiple data sources was not undertaken for triangulation (see Flick 2007) but to ensure that my research remained faithful to the complex phenomena under study (see Blumer 1954) and recover lost phenomena (Garfinkel 2002).

3.3.3 Data Analysis

The data analysis was ethnomethodologically informed and conversation analysis was utilised, where appropriate. The audio recordings of the interaction on the VHF radio were transferred from my digital audio recorder to a laptop and transcribed with the help of speech recognition software 'dragon naturally speaking'. I had about 85[49] hours of recorded data from the main study and 10.5 hours of recorded data from the field study. For my research purposes verbatim transcription of 24 hours of continuous recorded data was considered more than sufficient and I transcribed approximately 30 hours and 25 minutes of continuously recorded data and reviewed and annotated the rest of the audio tracks. 24 hours of round-the-clock recorded data would capture more than 100 vessel movements throughout the day for both MahaDevi and Sagar port, it would capture the movements undertaken solely to take advantage of the tidal window and it will also provide the binary opposition of the day and the night and the social actors that take to the VHF radio only at night (see chapter 4). The data I had obtained from the field was more than adequate for my work. The data was transcribed in three sweeps. On the first attempt, I transcribed the data in approximately 250 hours. In the second sweep I listened to the audio again and improved my transcript and earmarked select passages for further transcription in the conversation analysis tradition. The second round of transcription took me approximately 120 hours. On the third and final attempt at transcription, I faired the transcripts removing errors and transcribed the selected extracts utilising the transcription conventions developed by Gail Jefferson (1984) (see appendix 14, page 309).

Typing with speech recognition software did speed things along, however it was not without its pitfalls. Errors would creep into the typed text and had to be safe-guarded against. The few examples below illustrate some of the errors encountered –

Example 3.1: Some errors with voice recognition

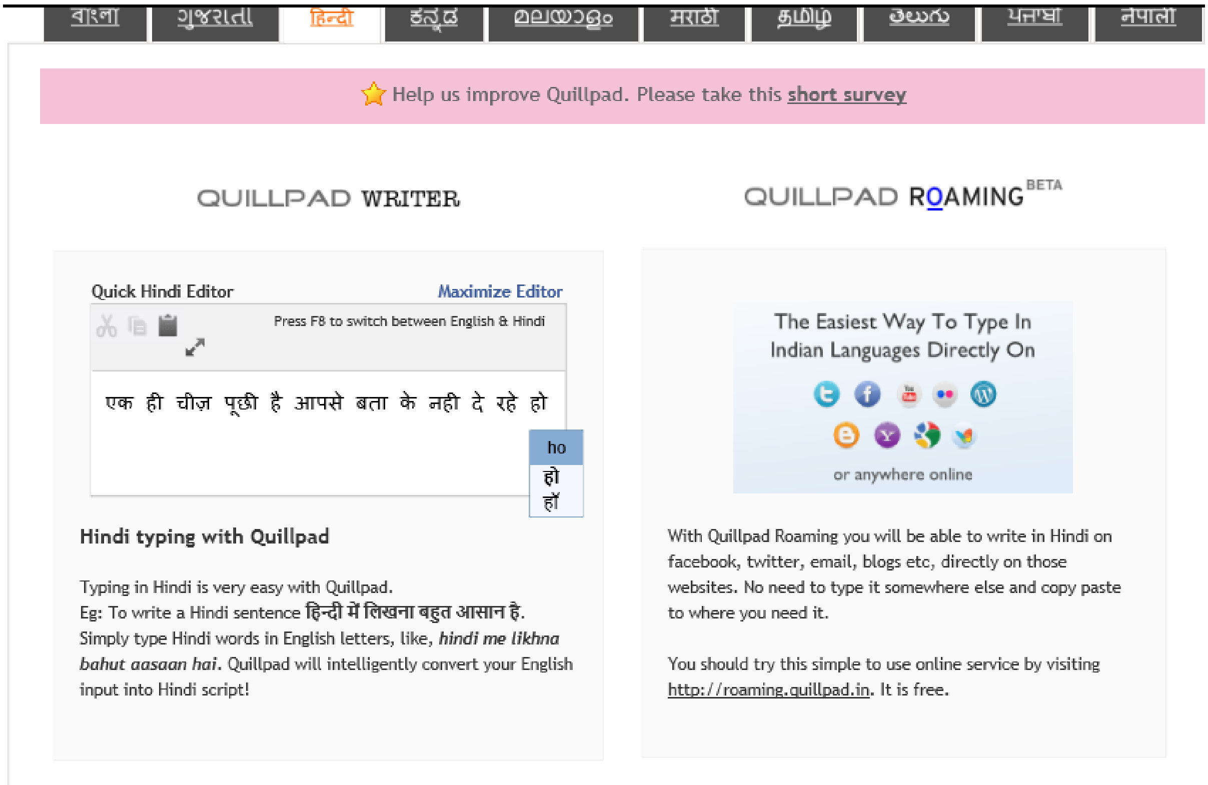
I said	***it appeared as***
Ethnomethodology	It's not methodology
	Ethanol methodology
Pseudonym	Sold on him
Earliest eta	Ugliest eta

I transliterated all Hindi utterances into English for the benefit of English speakers and present the translation along with the transliterated text. In appendix 13, p. 303-308, I render the

[49] I lost 18 hours of recorded data on the last day of the fieldwork when in my hurry I turned the power off without saving the recording that was underway. I also recorded three hours of silence on the fourth day of the fieldwork, when unknown to me someone entered the recording room and turned the volume down of the recording equipment.

transliterated text into the Hindi Devanagari script to allow Hindi speakers to crosscheck and validate my work. I have been trained in Hindi to English and English to Hindi translation as part of my undergraduate coursework (BA (Hons) English). Therefore, I did not need any help to translate the text, however I utilised an online tool 'quillpad' (available at www.quillpad.in) to convert the transliterated text into the Devanagari script (see figure 3.3).

Figure 3. 3: Screen shot of quillpad – rendering English keyboard strokes into Devanagari



Source: www.quillpad.in

My observations and conversations with the VTS operators appear in the form of field notes and annotated transcripts (as I had placed my recorder in the recording room and had taken the decision to verbatim transcribe 24 hours of continuously recorded data and annotate the rest). The field notes were faired and typed each evening after returning from the fieldwork. Each day after coming back to my accommodation after the day's fieldwork, I would put all the field notes for that day in one folder. I would download and save all the pictures taken and videos made on that day into a separate folder and mark them with the day's date. In this way I could correlate the field notes, the pictures and the videos with the audio track for a given date. Co-relating these could help me understand the traffic picture for a particular day. The examples cited in the thesis can be correlated with the audio data. The line number next to the example points to the excerpt's location in the transcript and the time stamp in the transcript points to the position of the example in the audio track.

The data was imported as a single transcript file into the CAQDAS package ATLAS.ti version 6 (subsequently upgraded to version 7). The data was coded with an ethnomethodological focus to identify recurring themes, patterns and practices in the institutional talk on the VHF that constituted the situated achievement of harbour/fairway navigation (see Kelle 2004; Schmidt 2004; Atkinson and Delamont 2005; Peräkylä 2005; Hammersley and Atkinson 2007, p. 158-190; Rapley 2011). Enduring key communicative stages in the vessel trajectories were revealed in close examination of the audio transcripts, as I noticed that certain specific information was asked of ships at certain stages in their journey which was in turn dependent upon the vessel's trajectory. An empirical typology based on the categories of key events was derived and developed from the initial analysis. Similar communicative events were sampled across my data set (see chapters 5 and 6). The data analysis moved from *what* the VTS operators and other social actors *do* in the port to *how* they do it, and finally *why* do they do what they do. My empirical findings were revealed with the ethnomethodological focus and predate port guidelines for reportage as the VTS manual was posted online by the port in Nov 2011, nearly a year after my fieldwork and the first Navigational Guidelines on information for port users and navigational procedures were posted a year after my fieldwork in Dec 2011. I argue that empirical findings obtained with an ethnomethodological focus in my research can inform the port about in situ practices on the ground and can be used to shape future reporting requirements as well as study the gaps between reporting requirements and the member's practices.

The data generated in my research is preserved in digital audio files, transcriptions, field notes, pictures and videos. An anonymisation key accompanies the data. The data was obtained and processed in accordance with the Data Protection Act, 2008. I underwent training on *Managing Research Data: Key Aspects of Legal Compliance and Record Management* organised by the University Graduate School of Cardiff University. I also underwent training on *Guidance for Managing Research Data and Records* organised by the University. The following sub-section discusses my field role and the impact of my gender in the field.

3.3.4 Field Role and Gender

Adopting the role of an *acceptable incompetent* (see Lofland 1971), a *novice student, learner, researcher* was suitable for my purpose as the VTS operators oriented towards the role and treated me like a student. They asked their colleagues to speak to me about their work and explain what they did. I was a mature student in the field and my notebook was central to my research experience – it helped me manage my role identity and guided my impression management. The VTS operators took it upon themselves to help me out with my research and support me in any way they could. I was not qualified to undertake participant observation in the VTS office, therefore I saw myself more in the role of a non-participant observer (see Gold 1958; Junker 1960).

My gender had an impact upon my field presence, especially in a *rigidly hierarchical setting with a strong occupational culture* such as the VTS office (see Sampson and Thomas 2003, p. 165, for hierarchy on-board a merchant ship). I did not go gender neutral, but managed impressions with appropriate clothing and conduct as discussed below. My gender could serve to amplify the *situational* and *ambient* risks in the field for me, which I needed to guard against and mitigate (Bloor et al. 2010). I was not paranoid, however I knew that my gender could make me an easy target and this was highly probable in the Indian patriarchal society with its cavalier attitude towards *eve teasing* which devalues the dignity of women and its high levels of violence against women (see Ghosh 2011; Urukundappa and Agnihotri 2013). Sexism, sexual hustling and sexual harassment have been experienced by researchers and they have had to largely ignore it in order to get on with the research, especially on a ship as it was considered a safe way to conduct research (see Sampson and Thomas 2003). I did not face any form of sexual harassment inside the VTS office, however I guarded against sexual harassment on the city streets, by ensuring that I left the VTS office on time (before the roads outside the port got deserted) and secured safe transportation for my journey to and from my accommodation which was almost 2 hours each way in heavy traffic.

When I was conducting my fieldwork in the VTS office of MahaDevi, the building was undergoing repair and renovation and there was builders' rubble everywhere. Apart from the top floor in which the VTS office was situated, I did not see other employees in the building, therefore, for my personal safety I stayed on the top floor and did not go exploring. I had reason to believe that there were no female employees in the building which made me the only female in the whole place. There was no ladies toilet on the floor of the VTS office and I did not go looking for one on other floors, which implied that for the duration of my fieldwork I went on an average of 11 hours without relieving myself. In hindsight, this was not ideal, but I felt that it was a small price to pay to stay safe during research.

Sampson and Thomas (2003) speak of management of their image and distancing themselves from their female 'gendered identities'. In the predominantly male space of the ship, a female ethnographer has to identify a 'role'/ 'part' and live the part.

> We resisted undertaking 'feminine tasks' such as helping with cleaning, administration, and catering whilst engaging in counter-stereotyped activities such as painting, chipping, taking an active part in life boat drills etc. (Sampson and Thomas 2003, p.180).

In order to mitigate the impact of my gender upon the research experience, I also needed to pay attention to my attire in conformance with my 'part'. Both in the interest of safety and for managing gender identity, I wore modest full sleeved printed ethnic Indian shirts (kurtas) teamed with cotton trousers and flat sensible shoes. I did not wear the traditional stole (dupatta) worn by Indian women as it can get in the way and I attempted to come across as progressive in my research role, without the stole. I mixed Indian and western elements in my clothing and presented myself as a sensible student seeking to undertake serious research. Emotional harm, particularly associated with feminist research methods, was not considered a risk in my field setting (see Sampson et al. 2008).

3.3.5 Ensuring Research Quality

Qualitative research is required to stand up to scrutiny and demonstrate its credibility through committed scholarship against quality criteria (see Steinke 2004).

> Maybe all we have got now is a general sense of the value of careful scholarship, commitment to rigorous argument, attending to the links between claims and evidence, consideration of all viewpoints before taking a stance, asking and answering important rather than trivial research questions (Seale 2004, p. 409-410).

In chapters 1, 2 and 3, I build a strong foundation for my research. My unique contribution to knowledge is identified after a literature review (chapter 2 which reveals a gap in the literature, which I aim to contribute towards). I demonstrate the rigorous scholarship of my research by linking my guiding ontological theory of ethnomethodology, with my research questions, the methods and the data that will answer the questions. In the first three chapters of the thesis I give evidence of research scholarship that attests to the credibility of my research endeavour. My study is not visualised in the conversation analytic tradition, however naturally occurring talk on the VHF radio is the main data source of the study. The empirical examples I cite (see chapters 5 and 6) make *transparent analytic claims* which can be evaluated by the readers for themselves. The next turn in talk on the VHF radio performs validation by displaying the emic reflexivity of the mutually oriented participants engaged in the task of harbour/fairway navigation. I have undertaken deviant case analysis for validation in my research and shown that when a key communicative act is overlooked or delayed, it is problematic for the participants, thereby attesting to the enduring order provided by the key communicative stages in achieving safe navigation (see Peräkylä 2011) (see chapters 5 & 6). While not replicable in the statistical sense, my research demonstrates credible research scholarship with its empirical exploration of a well-chosen sample case.

In order to ensure that the review of literature stayed current and updated, I undertook training in the Cardiff University organised session on *How to keep your research up to date*. The session taught me to set alerts based on topics, authors and websites. Alerts of new publications were delivered to my inbox hot off the press. Quite a lot of publications on the VTS started appearing from 2011 onwards, after I had returned from fieldwork. I also set alerts to inform me when a web page changed and the website of MahaDevi port started adding VTS specific information a year after my fieldwork in the port[50].

The penultimate section (3.5) of this chapter follows, in which I elaborate upon the ethical considerations in the research.

3.4 Research Ethics

In this section I discuss ethical issues for conducting research in the VTS office in India and consider there is much more to ethics than seeking compliance with the University Institutional Review Board (see Christians 2005). VTS operators can be considered vulnerable by virtue of their low rank and status in the port (for seafarers as a vulnerable group, see, Walters and Bailey 2013). In an ethnographic study in the workplace, due attention needs to be paid to the ethical conduct of the research at all stages. I commenced fieldwork after obtaining approval from the Cardiff School of Social Science School Research Ethical Committee (SOCSI-SREC 2004) (see appendix 1, p. 290). I followed the British Sociological Association's (BSA) ethical guidelines which promote best practise in research (BRITSOC 2002). I went beyond following

[50] The references have not been explicitly cited for preserving anonymity.

ethics in letter to being ethical in spirit. I made clear that the decision to participate in the research was voluntary and even after entering the project the participants could leave the research at any time of their choosing (Information sheet, appendix 5, p. 295). I sought informed consent and voluntary participation from all the VTS operators and recorded it in my field notes. The cultural challenge of obtaining informed consent needed to be addressed as research participants from outside the United States of America and Europe may be apprehensive about making a permanent mark on paper and wonder about what they are committing themselves to or signing away (see Marshall and Rossman 2006, p. 89). While I had designed the 'informed consent form' (appendix 6, p. 296), in the field I decided against its use, as it appeared insulting in the face of the magnanimity of the VTS operators. I gave the project information sheet to all participants, discussed my work with them and recorded their consent in my field notes. No physical, material or emotional harm to the participants was anticipated resulting from my research and I weaved ethics throughout the research process to ensure the conduct of an ethical study.

I followed the ethical principles of *non-maleficence, beneficence, autonomy/self-determination* and *justice* in my research (see Beauchamp et al. 1982; Murphy and Dingwall 2007). I built ethical safeguards in my project to protect the research participants. I ensured informed and voluntary participation (see Hopf 2004b), anonymised the port facility, the VTS operators, the pilots as well as the ships calling at the port. One VTS operator wanted me to write his name in my report and said, *"likho, likho, mera naam likho"* (translation – "write, write, write my name"). However, it was my responsibility to protect identities and therefore I made no mention of names anywhere in my research (see Silverman 2006c). In addition to ensuring confidentiality, I built trust in my interactions with the VTS operators (see Ryen 2011) as they openly spoke to me about anything they wanted to, including their apprehensions. Hammersley and Atkinson (2007) discusses research ethics *under five headings – informed consent, privacy, harm, exploitation and consequences for future research*. A charge levelled against researchers is that at times participants are exploited for the research purpose. Both research participants and the researcher may experience harm during the course of the research and harm may follow the participants at a much later date with the publication of the research. Sensitive portrayal and anonymisation would guard against any possible breach of privacy and harm to the research participants. My research was not exploitative as it observed the institutional work of the VTS operators, which they would have continued to do irrespective of my presence. Past experience of unethical research may bar future access for research colleagues and I ensured I conducted the research with due sensitivity to ethics. I faced challenges in anonymising the research material. I built layers of anonymity in the data in line with research ethics – I anonymised the Indian port facilities by giving them fictitious pseudonyms of MahaDevi and Sagar. I gave pseudonyms to VTS operators and anonymised the ID codes of pilots. I gave pseudonyms to all the ships mentioned in the thesis. I anonymised the names of anchorages and landmarks mentioned in the transcript excerpts and I anonymised pictures and diagrams prior to use. As far as practicable I have ensured ethical safeguards by anonymising the research material through. Literature on elite interviewing has looked at the challenges of interviewing unique individuals who stand a chance of being identified (Delaney 2007). This could be the case for the senior officers of MahaDevi, however I have sincerely endeavoured to protect identities of all individuals in the research by building layers of anonymity around them. This thesis would be lodged in the Cardiff University library which would further serve as a deterrent to ascertaining the identification of research participants. Research ethics need to be followed in spirit, in doing so, the researcher respects the participants, conducts ethically sound research and gains the respect of participants and gatekeepers alike. Several prosaic reasons have been discussed above for the conduct of ethical research, however, ethics are integral to the fabric of the research itself.

3.6 Conclusion

The methods chapter helps put in action, plans for the design and the conduct of research. The chapter justifies the ontological and epistemological underpinnings of my study to link theory and research questions with data generation methods. The evolution of the research from site visits, to a pilot, to the main research study is reflexively discussed. The main study has been discussed at length wherein I engage with the research techniques used for data generation along with the technical issues of generating and preserving raw data. Data analysis from an ethnomethodological perspective is discussed and it is argued that the chosen mixed methods of ethnomethodology, ethnography and conversation analysis are true to the research focus of an ethnomethodological workplace study. The probable impact of my gender on the field role and relationships is also explored in the chapter. Quality of the research with respect to the criterion of validity and credibility is discussed to demonstrate research scholarship and the sound foundations of the study. Research ethics are also discussed with respect to several ethical principles. Chapter 4, the first of the findings chapters, follows – it introduces the MahaDevi harbour, locates the key social actors at the scene and highlights the cacophonic bedlam of the marine radio that greets the uninitiated.

Chapter 4 The Harbourscapes

VTS – *"I am watching you, I am watching you all the time. Keep coming."*[51]

VTS – *"Please stop it. Have some shame please. This is port working channel."*[52]

VTS – *"Okay keep coming to the pilot station. What is your eta to pilot station?"*
NAM 11 – *"Sir, one two three zero. One two three zero, eta to pilot station"*

"Hello, are you there?" (A seductive mobile phone ring tone in a female voice)

Seafarer – "Teri gaand mein lund" (transliteration) *"A phallus in your anus"* (translation)[53]

Recorded song plays on the VHF
Male – *"You can try your utmost to hide love but the world will come to know";*[54]
Female – *"However meeting in secret will make the meeting pleasurable"* (translation)
Male – "Tum laakh chupao pyar magar, duniya ko pata chal jaayega";
Female – "Lekin chhup chuup ke milne se milne ka mazaa to aayega" (transliteration)

A VTS operator comes into the office, acknowledges my presence and walks to his colleague to relieve him and take over the communication on the marine radio. They chat briefly and exchange information about what has been happening regarding ship movements. The VTS operator on duty, points out a few details on the computer screen and the log that he has been updating by hand and gets up to leave. The incoming VTS operator places a hand towel on the back of the chair, personalises his work space and is ready to go on air (field note, 23 Dec 2010).

4.1 Introduction

The above selection of extracts introduces some of the content being aired by the different social actors over the marine radio in the Indian world port. The extracts introduce the diversity in the aired content and provide illustrations of professional talk in the communicative management of ships in the fairway, unique mobile phone ring tones, profanities and the melodies aired in the harbour. The field note that follows the extracts

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51 VTS operator to motor tanker *Petrol 24* as it made its way to the pilot station.

52 During his night shift, the VTS operator did not approve of some of the content being aired on the marine radio and tried to appeal to the sense of shame of the miscreants to stop its abuse. His tone was resigned and his pronouncement had no effect whatsoever. This would be further explored in section 4.6 on profanities and section 4.7 on music in the harbour.

53 A swift verbal repartee – an insult traded for an insult on the lines of the verbal duelling by Turkish boys (Dundes et al. 1986) wherein even though rhyme in trading insults, is important, an insult may be effective without rhyme if it achieves the desired purpose of effectively reducing the other to the 'submissive female position' in a male homosexual act. Why the female position is considered 'submissive' is beyond the scope of this study. What is noteworthy here is that the Hindi insult is without rhyme, whereas in the English translation, 'phallus' rhymes with 'anus'. Nevertheless, the swift, short and strong insult in Hindi sans rhyme effectively silenced the seafarer's opponent and achieved the desired outcome.

54 Songs are integral to the night time soundscape of the harbour.

makes reference to the prior preparation of the VTS operator before going ‘on air’. Chapter 4 is the first of the empirical chapters. In this chapter I introduce the case of the MahaDevi VTS (see Goldthorpe et al. 1968; Burawoy 1998), identify and situate the key social actors in the harbour and explore the Harbourscapes. Chapters 5 and 6 empirically explore the achievement of safe channel navigation while this chapter introduces the protagonists / members that shape and populate the harbourscapes. Chapter 4 explores the scene of the harbour, the VTS office, the work of VTS operators, work organisation and the inherent challenges faced by the operators in their work. The chapter also unpacks what it means to be a VTS operator in MahaDevi port. It introduces the overwhelming noise of the marine radio that greets the first time listener and introduces other social actors in the harbour – the Dock Master, harbour pilots and the colourful fishermen. It highlights what is being said on the marine radio, by whom, to whom and to what effect. The social actors in the harbour, in addition to occupying a physical space, occupy the aural and visual harbourscapes. This ethnographic study draws upon ethnomethodology and interactionism and is largely aural in nature with the researcher herself having to navigate the soundscape of the audio recordings[55] of interaction on the marine radio to make sense of the life world (see Husserl 1936/1970) of the VTS operators. The following section (4.2) explores the complex harbour space.

4.2 A Complex Life World

India has a vast coast line of over 7517 Kilometres (www.india.gov.in 2013). Situated along the coast of India, MahaDevi is an international world port[56]. Further along the coast, to the south is the confluence of the Arabian Sea, the Indian Ocean and the Bay of Bengal. The harbour is abuzz with activity and the VTS operators have to remain alert to it all. In addition to the civilian traffic of merchant ships, barges, dredgers, tugs and fishing boats, the harbour is used by the Indian Navy and Coast Guard and nearby are several prominent installations vital for the Indian economy and defence.

> The MahaDevi harbour is situated far out at the edge of the city and it took me nearly two hours to get there. I couldn’t get a taxi in the morning and was informed that the drivers would start work later in the day as winter had set in discouraging them from venturing out

[55] Supplemented with semi-structured interviews, unstructured interviews and ethnographic observations. See chapter 3 on ‘Researching the VTS’.

[56] The port caters to a diverse range of cargo (general, containers, oil etc.) and has several docks (wet and dry), jetties, a cruise terminal and bunders.

early in the morning. My two years in the UK had acclimatised me to the cold and I wasn't wearing a jumper, while the local labourers were donning woollen hats and huddled in blankets. I didn't think that it was so cold that drivers couldn't come out in the morning, however, I didn't have the luxury of being late as I had to begin the day's fieldwork on time. I hailed an auto rickshaw to take me to the train station and was on my way. I bought a train ticket and hopped onto an empty ladies compartment (it was considered safe to travel in an all-women's coach). Given the population of India, the odds of being alone in a train compartment are pretty slim and here I was completely alone for the duration of my journey. It did not strike me as odd at the time, however on getting out at the final train station I realised that I had been travelling in the first class compartment which explained, somewhat, why I had journeyed alone. There was nothing first-class about it as it wasn't very clean and there was a small puddle of water on the compartment floor. Nevertheless, I realised that I owed the Indian Railways the difference in fare plus the fine which could amount to 10 times the ticket fare. It wasn't the time or the place to reflect on a guilty conscience over an unpaid train ticket. I quickly made my way past the crowds, intent on exiting the station as fast as I could. Large crowds at public places especially train stations made me nervous and I quickened my step. India is no stranger to terrorism as it was only in 2008 when gunmen armed with AK-47s had opened fire on commuters at an Indian train station. Once out, I began a long walk to the port. After a while I came across the tall boundary wall of the port facility and made my way to the entrance. The security guards satisfied themselves with my dock entry permit. A female security guard wanted to check my laptop bag and laughed when I told her that I did not have a laptop with me but was using the bag to carry my lunch and a bottle of water. She told me that she would have asked me to go through the Indian customs checkpoint had I been carrying my laptop. I cleared security and walked in and turned right to walk the final half a kilometre to the VTS office at the edge of the pier. I could smell the salt in the sea breeze, several ships were docked and cargo operations were underway on one. Trucks waited in line to load the food grains stored in the bowels of the ship. Huge tarp covered the side of the ship to stop food grains from falling into the sea. A crane worked continuously and dock workers with their heads covered by cloth shaped like a turban (presumably to protect themselves from cold or injury or both), shouted as they did their work. In the predominantly male space of the harbour, port and docks, I was acutely aware of my biological female sex. I was aware with every step that I took that I was an oddity in those parts and apart from the female security guard whom I had left behind at the gate, there wasn't any other woman to be found in the area. For my safety, I found myself walking fast to leave the scene behind me quickly to reach the VTS office. The fog hadn't lifted on the cold winter morning, the visibility was poor and I could hear the fog horns in the distance as ships made their way in the channel. I ascended to the VTS office in the lift and began yet another day of fieldwork. It was not the exotic locale where I needed to squat with the natives but an urban setting on the lines of Chicago research. It struck me that this place was far removed and not easily accessible, even though it was an urban locale[57] (field note, 24 Dec 2010).

[57] See Atkinson, 1990 on getting to the fictitious 'Topos'.

The VTS operators in the port occupy a complex multi-dimensional, multi-layered and a dynamic multi-modal life world (see Schutz 1967; Husserl 1970; Habermas and McCarthy 1987, 1991; Dicks et al. 2006; Atkinson et al. 2008). From their vantage point atop a tall tower at the edge of the Pier, the VTS operators overlook the harbour, monitor the traffic in the channel and talk to shipboard seafarers and pilots to achieve safe navigation in the restricted waters under their purview.

Figure 4. 1: Cargo ships and other craft moored alongside

Source: Student (picture taken and used with permission)[58]

Innumerable craft dot the seascape while the interaction on the marine radio dominates the harbour soundscape. At any given time, several ships are anchored outside the port limits waiting to be called in, while ships scheduled for movement ply in the channel[59] – coming into berth or going out to sea. Innumerable vessels are anchored inside the port limits on either side of the channel seemingly sandwiching the ships moving in an orderly fashion in between. This is the inspiration for the presentation of the chapters in the thesis – chapters 4 and 7, on either side of 5 and 6, address the chaos, clutter and messiness of the complex research site, while chapters 5 and 6 present the in situ accomplishment (practices, procedures and institutional talk) of safe harbour/fairway navigation (see Schegloff 1992; Garfinkel 2002). The VTS operators, shipboard seafarers, Dock Master, harbour pilots responsible for piloting the ships

[58] The picture was taken through coloured glass of a closed window (it was fixed and couldn't be opened).
[59] Inbound ships make way to the anchorage points inside the port limits or for berthing at the assigned berth while outbound ships head out to the high seas.

in the channel, fisherman out for the day's catch and seafarers on-board small local craft (for e.g. tugs, pilot launches and barges) are the multiple social actors / members communicating on the radio. The harbour is a hub of activity with ships at anchor, ships on the move, pilots undertaking pilotage assignments, pilot launches assisting in embarking and disembarking pilots, tugs assisting in manoeuvring ships, barges servicing ships, fisherman waiting with their nets cast, Coast Guard undertaking harbour patrols and naval vessels making use of the space. Almost all of these movements are in large part achieved by interacting on the marine radio. The soundscape at the first instance appears cacophonic and daunting but closer analysis helps reveal its layers to explore the communicative management of ships in the harbour and the social accomplishment of navigation in restricted waters.

This thesis draws upon ethnomethodology of Garfinkel (1996, 2002, 2006), ethnomethodological programme of workplace studies (Rawls 2008), symbolic interactionism (see Mead 1934; Atkinson and Housley 2003; Reynolds and Herman-Kinney 2003) and related ideas (discussed previously in chapter 2 on the review of literature). Ethnomethodology is suited for the study as it empirically demonstrates the members' accomplishment of harbour/fairway navigation (see chapters 5 and 6); ethnomethodological workplace studies foreground work and its in situ accomplishment and the symbolic interactionist perspective is suited, as language in interaction is central to meaning making in the interactionist perspective (see Denzin 2004). Exploring the interaction on the radio reveals how social actors accomplish navigation in the harbour (chapters 5 and 6), how they act and react towards each other, (re)inscribe roles and identities, (re)inscribe and perform rank, status and hierarchy in the port (chapter 7). This chapter draws upon Goffman's (1959) concept of dramaturgical performance. This concept is useful as everyday two parallel performances take place in the port, one on the air and the other in the Arabian Sea. Navigation safety is performed in part, orally on the port VHF radio and the physical spatio-temporal performance of the navigation of marine traffic takes place in the harbour and channel waters. The VTS operators, seafarers, harbour pilots, Dock Master, harbour control, control station, the different docks and port office are all stakeholders in the performance of channel navigation. Just as stage directions are critical to a theatrical production, similarly the identification and location of the social actors in the port are critical to facilitating an understanding of their life world and to exploring the achievement of navigational safety. Time is all pervasive in the harbour, and before I situate the social actors in the scene, I explore the timescapes in the harbour.

4.3. Time and Tide in the Harbour

This section maps Adams' (2004; 2008a) concept of *Timescape* on the data and highlights the utilisation of the knowledge of time and tidal constraints by the members in the accomplishment of institutional work. Knowledge of the time of scheduled operations is crucial in the monitoring role of the VTS and the safe and efficient traffic movement and tidal constraints for deep draft vessels are factored in the scheduling requirements. Giving, obtaining and deploying knowledge of the time of scheduled movements and the real time development of the traffic situation over time can be understood as members' methods in work accomplishment.

4.3.1 Harbour Time

The port operates 24x7[60] and the VTS operators' shift has a 24 hour *Timeframe*. The all-encompassing *Timescape* of the harbour embraces the *'spatiality, materiality and contextuality'* of harbour navigation while foregrounding their temporal interdependency (see Adams 2004; Adams 2008a). Ship movements, port operations, channel navigation and the work of VTS operators are all about *Time*. The VHF radio is replete with talk of 'ETA[61]' and 'ETD[62]', pilot boarding time and disembarking time, anchoring time and underway time (see chapters 5 and 6). Adams (2008a) expounds *Timescape*, *Futurescape* and *Timeprint*. Concerned with the future, *Futurescape* and *Timeprint* (also see Adams 1998; Adams 2008b) are forward-looking and do not preoccupy the VTS operators in their day to day work. However, *Timescape* with its structural elements helps explore the patterns and nuances of *Time* related harbour operations. The structural elements of *Timescape – Time Frame, Temporality, Timing, Tempo, Duration* and *Sequence* are discernible on the port radio. Upon extending the *Timescape* concept to the harbour I found that *Time is money* in port operations and *Time is safety* in channel navigation. *Time* is mentioned extensively on the port VHF radio and the structural elements of *Timescape* reveal how *Time* is deployed by the social actors to achieve channel navigation. *Timing* helps explore the coordination, synchronisation and when

[60] 24 hours a day, 7 days a week, continuous port operations.
[61] ETA – Estimated Time of Arrival
[62] ETD – Estimated Time of Departure

something could be expected (see Adams 2004, 2008a) and *Sequence* gives order. *Timing* informs when a particular vessel movement will take place and the *Sequence* informs the order of vessel movements in the channel. Taken together *Timing* and *Sequence* streamline traffic movement and shape the provision of Traffic Organisation Service (TOS) by the VTS. The two neighbouring VTSs deploy these structural elements to share the ship movements of their respective ports which contributes to their joint awareness (see chapter 6). In the example below, the VTS of the neighbouring Sagar port calls MahaDevi VTS to inform of its ship movements, so that they are aware of the expected traffic movements and the time they are scheduled to take place.

Example 4.1: Interaction between two neighbouring VTSs

9404. **SP –** VTS, Sagar Port
9405. **VTS –** Sagar Port, bolo (translation – speak)
9406. **SP –** Haan, Namaskar timing dena hai mujhe (translation –Yes, greetings, I have to give the timing)
9407. **VTS –** Go ahead
9408. **SP –** First pick up, *Shiksha*, one two one zero, SP eleven, Shiksha, one two one zero, SP eleven. *Anjeer*, motor vessel *Anjeer*, Alpha, November, Juliet, Echo, Echo, Romeo, *Anjeer* pick up one two two zero, SP twenty one.
9409. **VTS –** Okay
9410. **SP –** and third, *Tom six*, *Tom six* pick up, one three four five, SP eighty one
9411. **VTS –** Okay
9412. **SP –** and *Cape Town*, *Cape Town* off one two three zero, pilot SP eighty one. *Cape Town* off one two three zero SP eighty one. *APL Victoria*, *APL Victoria* off one three four five, SP twenty one, Over
9413. **VTS –** okay
9414. **SP –** Okay aapka koi aayega? (Translation – any vessels coming for your port?)
9415. **VTS –** *Blue Sky*, one three three zero for new pier berth, *Blue Sky*
9416. **SP –** okay, Blue Sky
9417. **VTS –** And *Mama* for number one dock, one three three zero

The interaction between the two neighbouring VTSs that jointly contributes to their awareness and helps achieve safe movement of traffic will be discussed in chapter 6 on two neighbouring VTSs and the achievement of coordinated traffic movement.

Duration is concerned with how long something takes – the VTS operators want to know how long a ship will take to reach the pilot station. They want to know how long a dredger will continue to dredge before coming back into the main channel. The waiting pilot for an inbound ship needs to know how long the ship will take to arrive so that he can accordingly plan to board the vessel for his pilotage assignment.

Example 4.2: VTS-ship interaction

199. **VTS –** that is correct, but how much notice you require, how much total time you require to arrive pilot station?
200. **Kanwar –** wait a second I will calculate
201. (lines omitted)
202. **Kanwar –** Roger we need around six hours to pilot station over
203. **VTS –** okay you require six hours, okay thank you, stand by

Example 4.3: VTS-dredger interaction

7447. **VTS –** how long you want to stay?
7448. **Kajal 20 –** going to dredging area sir
7449. **VTS –** how long you will be there?
7450. **Kajal 20 –** sir fifteen minutes fifteen to twenty minutes maximum.
7451. **VTS –** Okay

In example 4.4 below, the pilot has disembarked from one ship and is waiting to board the next assignment, *Bernice*, and wants to know how far it has reached. The interactional practice of first obtaining information on a target from the VTS and then calling the same target, as in the example below, is a feature of the port institutional talk discussed in chapter 6.

Example 4.4: Pilot, VTS and *Bernice*

9489. **Pilot M 4 –** Yeah VTS, one zero five zero disembarked and how far is *Bernice* now?
9490. **VTS –** *Bernice*, now off inner red buoy.
9491. **Pilot M 4 –** Yeah okay
9492. **Pilot M 4 –** *Bernice,* pilot
9493. Bernice – Pilot this is Bernice, good morning to you
9494. **Pilot M 4 –** You keep coming up in the channel do not stop at the pilot station wherever we meet, I will board you. Over.

Tempo is the speed and for VTS operators, knowledge of speed the vessels are doing in the channel is important for the safe and continuous movement of traffic. *Distance*, *speed* and *time* preoccupy the members in the port for planning and coordination, and feature prominently on the port radio.

Example 4.5: VTS-ship interaction

8677. **VTS –** okay and what is your speed now?
8678. **Charisma –** seven point five

8679. **VTS –** seven point five, okay copied, maintain your eta zero nine one five, pilot station

Time is money for the port and the port has 24x7 operations to further that end. A fast vessel turnaround determines its ability to provide berths to ships waiting outside the port limits wanting to discharge their cargo at MahaDevi port and translates into increased revenue. *Time is money* for the pilots who are remunerated for the time spent in Pilotage operations. *Time is safety* for the VTS operators as their work involves ensuring that the right ship is at the right place at the right time. To achieve this, the VTS operators actively call ships to arrive at the pilot station or get ready to depart the port, whichever the case may be. Everything needs to move as per schedule or safety could be compromised. There is a right time and the wrong time for vessel movements in the port.

In example 4.6, the concerned pilot has to board the vessel shortly and engages in the customary interaction to prepare the vessel for pilot boarding. The pilot is surprised to learn that the vessel is not ready for departure. In such an interaction, the question for ascertaining the readiness of a ship is rhetorical in nature and in line 5, the pilot utters, 'You are ready?', giving the vessel an opportunity to respond.

Example 4.6: Pilot-ship interaction

107. **Pilot –** *Sunder*, pilot
108. **Sunder –** Pilot, *Sunder*
109. **Pilot –** You are ready for sailing?
110. **Sunder –** Negative Sir, I am not ready
111. **Pilot –** You are ↑ready?
112. **Sunder –** Negative, negative Sir, I am not ready
113. **Pilot –** Why are you not ready?
114. **Sunder –** Sir waiting for provisions
115. 2.0
116. **Sunder –** Sir, *Sunder*
117. **Pilot –** yeah your scheduled time of departure is one four zero zero
118. **Sunder –** No sir, I know my departure time is one four zero zero, but some problem creates, so I not sailing out. When I'm ready I give you a call
119. **Pilot –** No, no, I am coming. I will take attendance and come
120. **Sunder –** Sir Roger, copied

Harbour control monitors all interaction on the port VHF radio, and on hearing the interchange between the pilot and *Sunder*, reprimanded the vessel for not being ready on time and *Sunder* found itself at the receiving end of the Dock Master's ire.

Example 4.7: Harbour Control; reprimand to Sunder on missing etd

121. **HC –** *Sunder*, *Sunder*, Harbour Control
122. **Sunder –** Harbour Control, *Sunder*
123. **HC –** ↑Why are you not ready for sailing? ↑Why have you not informed? ETD was ↑fourteen hundred hours
124. **Sunder –** sir not coming so I have waited for provisions. When I am ready I will give you a call.
125. **HC –** ↑When will you be ready? Your programme (.) docking is cancelled. ↑Do a rebooking. Keep taking people for a ride. You should have told you are not ready.
126. **HC –** ↑Tell your agent again, your programme is cancelled, let him do a ↑rebooking
127. **Sunder –** Roger, Roger Sir, copied that
128. **HC –** ↑And we'll make a report that you didn't tell ↑Harbour Control that you are not ready.

The Dock Master in charge of Harbour Control exercised his authority and cancelled *Sunder's* pilot booking. The authority of the Dock Master, his rank, status and role in the port will be discussed in section 4.5 of this chapter as well as in chapter 7. Example 4.7 also reflects upon the role of the VTS in the harbour and shows that Harbour Control has more authority than the VTS (explored in chapter 7).

4.3.2 Harbour Tides

A deep draft vessel can only come in on the high tide, in which case, tide tables are consulted to plan, schedule vessel movements and assign berths. To adjust the draft of the vessel, some of its cargo may be discharged at the lighterage area, before it is moved to a suitable berth. Such a vessel may even be assigned a berth inside the docks, where the lock gates maintain the level of water irrespective of the tidal variations. One vessel, *Kanwar,* (example 4.8) was unable to get underway at the scheduled time owing to engine trouble and was informed that it would now have to wait for nearly 5 hours, until the tide permitted movement again.

Example 4.8: Harbour Control and Kanwar; need to wait for high tide

8119. **HC –** yeah *Kanwar* if you have some difficulty uuuhh and what will be your maximum speed? And what time you think you will be underway, now?
8120. **Kanwar –** Sir I got problem with my engine sir uuh please do assist me, over
8121. **HC –** then in that case, please do not heave up your anchor, and we will do your movement only during the daytime, after eight o'clock, maybe when the tide permits again, after around two, over

Time is both money and safety in ports. It is revenue for the ports[63] and remuneration for the pilots. It is safety for channel navigation as vessels have to move as per the schedule and the right vessel should be in the right place at the right time. Time and tide inform and constrain channel navigation as everything is planned for and scheduled keeping them in mind. The work of the VTSOs entails the interactional achievement of the traffic plan and movement schedule (see chapters 5 and 6). This section highlighted the utilisation of the knowledge of time of scheduled operations and the tide as members' methods for work accomplishment.

After a discussion of the *Timescapes*, I turn to the main protagonists of this thesis, the VTS operators of MahaDevi port, who are responsible for monitoring vessel traffic, conducting ship to shore VHF radio communication and providing VTS services in the harbour.

4.4 VTS Operators of MahaDevi

This section pertains to the Vessel Traffic Service operators of MahaDevi port. It locates them in the harbour, explores their office space, their role, work, organisation of work, training and their rank and status in the port. This section seeks to bring to the fore what it means to be a VTS operator in MahaDevi – a hub of Indian trade. The role of MahaDevi VTS operators is to monitor traffic, provide VTS services to ships in the area and mitigate risk and promote navigation safety in the harbour.

63 Time is money for the shipping companies as a fast vessel turnaround time translates into money saved in port dues for the companies.

Figure 4. 2: A MahaDevi VTS operator on the VHF, in the middle of a telephone call and completing necessary documentation[64,65]

Source: Student (picture taken and used with permission)

The VTS office is on the top floor of a tall building at the end of the pier[66]. Since the office of the MahaDevi VTS was being renovated in preparation for the up-gradation of the VTS, when I conducted my fieldwork, the VTS operators worked from a smaller room adjacent to the original office. The MahaDevi VTS office is ideally located on the water's edge directly overlooking the Arabian Sea. The VTS operators take into account the information from decision support system (AIS, Radar, ECDIS, port software platform and running logs) in front of them and talk to ships on the VHF radio. The VTS operators depend upon the VTS system to monitor traffic and design the content of the radio call. The visual is useful to the VTS operator. The computer screens in front of the VTS operators play a pivotal role in enhancing situational awareness by helping contextualise the physically visible in relation to other traffic in the channel (for building situational awareness, see Brödje et al. 2010).

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[64] Also seen in the picture are the logs that are maintained by hand. Two computer screens (from right) relay the information received from the radars, AIS and the electronic charts. The computer screen on the far left displays the customised port software platform in which Pilotage reports and other information is entered.

[65] The modest old style desk tops were due to be replaced in the up-gradation of the VTS.

[66] The VTS office can be referred to as a VTS tower in a similar vein as the ATC tower in aviation. The word tower seems appropriate given that the VTS office is usually physically located at a height directly overlooking a section of the waters, providing a bird's eye view to the VTS operator.

> Out of the window, to the left, I could see the ships sailing diagonally past, up the channel. They moved in a single file, like a procession marching by (field note, 22 Dec 2010).

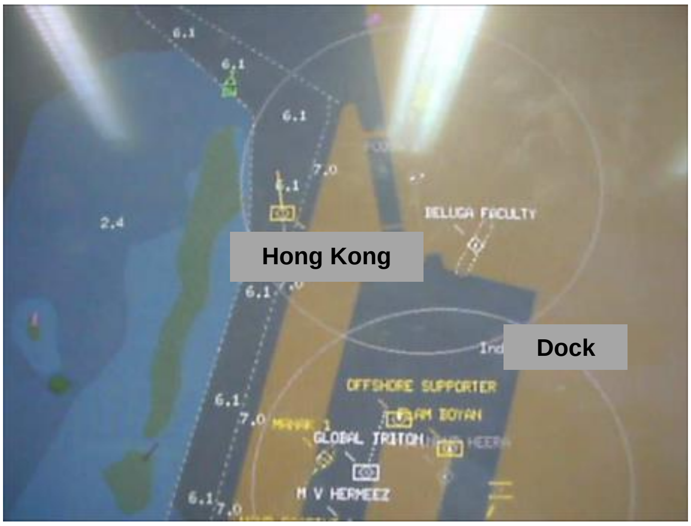
> Before the VTS system had come we only had ears and no eyes. We would call a ship but we could not be sure how far it had come as we could not see it on our screens.....with the VTS, it is a whole lot better (Interview with VTSO 1).

In the picture below (figure 4.3), two tugs assist *Hong Kong* to depart the port. The first picture (figure 4.3) captures the physically visible vessels in the winter haze and the second (figure 4.4) depicts the electronic vector of *Hong Kong* pulling away from the mooring position and moving into the dock channel which connects to the main channel.

Figure 4. 3: Tugs assisting Hong Kong depart the port

Source: Student (picture taken and used with permission)

Figure 4. 4: Hong Kong pulling away from the mooring position into the channel



Source: Student (picture taken and used with permission and appropriately anonymised)

Correlating the physically visible with electronic information presented on the screen is one of the members' methods to accomplish the traffic monitoring role of the VTS.

> I was struggling to take the picture of *Hong Kong* from the computer screen as the glare from the monitor and the reflections were making it difficult to capture a clear shot, when the Dock Master came in, saw what I was attempting to do and took the camera from me, took a perfect picture and said, *"this is for PhD isn't it?"* and I was reminded once again of ensuring ethical propriety in my research conduct (field note, 24 Dec 2010).

> The MahaDevi VTS office has two workstations. There are two monitors each on the desks of the two VTS operators. The operators usually set one screen to display the entire channel and the second screen is set to provide a close up view of a cross-section of the channel[67]. The desks of the two VTS operators are set at right angles to each other. One desk overlooks the Arabian Sea and the other is set against the wall to the left. There are three sets of VHF radio – one each on the desks of the two VTS operators and the third is placed on the far left on the desk that overlooks the sea. At any given time usually two of the VHF radio sets are used. One is attuned to channel 15 – the main working channel of MahaDevi port and the other is attuned to channel 6, the channel for the pier Control Station, used for internal communication. There is a third desk set against the wall of the makeshift office, to the left. This is used by a Clerk who works a 10 am to 6 p.m. shift. The work of the clerk and his grade have a connection with the work, grade, remuneration and morale of the VTS operators (field note, 21 Dec 2010).

> The volume of the second VHF set placed on the desk of the VTSO[68] to the far left[69] is kept lower than that of VHF channel 15 (MahaDevi main working channel). This set is tuned to channel 6 meant for internal communication to make the VTS operators aware of the goings-on between the pilots, pilot launches, tugs, mooring crew, communication from the Dock Master' office etc. (field note, 21 Dec 2010).

> A VTS operator said that in the beginning of his career as a VTSO all the incoming VHF calls from the two VHF sets were like 'noise' and subsequently he learned to filter/distinguish what was of relevance to him in the performance of his duty (interview with VTSO, 4).

> The VTS office is a loud physical space. The VHF calls cackle loudly from the speakers and the telephone ring adds to the decibel levels in the room. The hum of the electrical equipment and the air conditioning further adds to the noise. In the beginning it was difficult for me to make out what was being said over the VHF and why. Each incoming VHF call is like a loud radio broadcast. The VTS operators, on the other hand are at ease, answering calls quickly and attending to their work while I struggled to comprehend what

[67] See figure 4.2, page 105

[68] The desk of the VTSO directly overlooking the Arabian Sea. In practice this is the main desk occupied by the VTSO on duty. If another VTSO came in, then he would need to sit on the second VTS workstation against the left wall.

[69] Placing the VHF sets apart helps the VTSOs to separate what is important to them and what can be in the background. During my site visit to VTS office in the UK, I was told by the VTSO on duty that keeping the VHF sets apart helps him to distinguish what is important to him and what is not.

> was being said. Finding a quiet moment, I would ask them about what had been happening and what had just been said (field note, 22 Dec 2010).

Physical separation of the VHF sets on the desks helps separate the radio calls that need to be attended to in real time and VHF radio interaction that can take place in the background. This itself is the organisation of workspace and artefacts supportive of work accomplishment and can be understood as a members' method (see Kawatoko 1999; Rawls 2008).

Different VHF channels are used by the individual docks[70] in the MahaDevi port. Different radio channels are also used by the organizations/entities using the harbour, to communicate internally within their own department/organisation. Even though a group might communicate within itself on a VHF channel different to that of the MahaDevi VTS, the vessels of these entities must monitor channel 15, the designated working channel of MahaDevi port, while in its fairway. While switching/changing channels in the harbour, vessels may miss out on key safety information that could affect their awareness of the developing traffic situation as they would not have followed the narrative on the designated channel. The theme of monitoring the appropriate VHF channel is discussed in chapter 6, section 6.4.1, p. 219-222. Next, I turn to the work of VTS operators and the organisation of their work.

4.4.1 The MahaDevi VTS – Work and Its Organisation

MahaDevi port has a 24-hour operation and in consonance with that, the VTS station is manned around-the-clock. Four VTS operators report on duty at 7 am for the beginning of their 24 hour shift and between themselves take turns to work and rest. They usually work three hours at a time and in total could work for more than six hours during the 24 hour shift. At any given time, usually one VTS operator is in the office and another might join him, depending upon the workload and traffic volume[71]. The following day a different set of four would report on duty[72] and the cycle would continue. These men travel on an average, nearly two hours each way to get to their office. In an interview with one VTSO, I was told that this arrangement helped the VTS operators, as most of them live in the suburbs, which are far from their place of work and with a 24-hour shift pattern (with rest interspersed) they need to report

[70] There are three docks in the port.
[71] The other three can be in the designated restroom for the VTS operators, which is furnished with desks, chairs, beds etc. so that they can read, eat, rest and sleep there.
[72] This had a bearing on my data collection as within two days, I interviewed eight VTS operators.

for duty three days a week and have four days off. Though hectic, the design of the 24 hour shift pattern suits them as it addresses their need of travelling to their place of work a few times each week. This also reflects upon their perceived nominal salaries and the high price of real estate in the port city which drove them to live in faraway city suburbs.

The MahaDevi VTS operators are 'operators' and not officers. Their job is of a clerical grade and they felt that there was a lot of work load and stress and pressure in their job. It was widely felt that the work required of them did not match their grade or salary. Consequently it was felt that their grade level and remuneration did not do justice to them and the work they did. This affected the morale of the MahaDevi VTS operators. I was told that their salary was less than INR[73] 30,000 or USD[74] 600 a month, which was less according to them for living in the Indian port city (see chapter 7 on the micro politics of port communication).

A ship arriving at MahaDevi port first makes contact with the VTS on coming within the range of the VHF radio. This first call to the VTS announces the arrival of the ship in the vicinity and its participation in the port VTS system. A key piece of information at this juncture is obtaining the Estimated Time of Arrival (ETA). This information is passed on to the office of the control station. This sets the wheels in motion; the control station may have already received a booking request from the ship’s local agent and based on the availability of berths and pilots, a programme is made available to the VTS. The programme originates from the Harbour Master’s office where it is prepared after a combined traffic check for all the docks and available berths. This programme is further developed by the Dock Master Station’s office by assigning pilots to ships before being made available to the VTS office. This programme is a blueprint of the day's movements that gives an indication of the vessel movement in the channel. The programme can be updated during the course of the day as and when more information is made available. However, this programme is limited to the merchant vessels of shipping companies whose agents have applied for a berth at MahaDevi port and hence by itself cannot account for all of the traffic in the very busy harbour as the harbour is also used by vessels who turn up without a pre-booked berth (and apply subsequently), by the Indian Navy, Coastguard, barges, fishing boats, dredgers, tugs etc. The VTS operators call ships on

[73] Indian National Rupees
[74] United States Dollar

the radio, based on the traffic movement schedule and instruct them accordingly.

> "Hamara kaam hai, eta liya, usko pass kiya" (Transliteration)
> "Our work is to get the eta and pass it on" (Translation – discussion with VTSO, field note, 22 Dec 2010)

Depending upon the day's docking programme/schedule, the MahaDevi VTS operators call the ships in ample time[75]. Speaking to ships, is informed by the ship's trajectory and the corresponding key stage in communication. Chapters 5 and 6 empirically identify the main ship trajectories in the harbour and explore the key communicative stages in the ship's voyage. Ships are monitored and the VTS operators speak to them at key junctures for navigation safety.

> "Our main task is to bring the ship safely from outside to the pilot station and from the pilot station to its berth. Our job is to take all the relevant information from the ships and pass on their eta to the office of the control station which would then arrange for pilots, pilot launches, tugs etc. as per requirement" (interview with VTSO 2)

The VTS operators are very busy. There are incessant calls on the VHF and the telephone. They do a lot of paper work and there is some duplication of effort in the record-keeping being done. The *MahaDevi* VTS operators feel that there is heavy workload and stress in their job and that they cannot make a single mistake. The interview excerpts are illustrative –

> *"We cannot make a mistake"* (translation)
> "Galti hum kar hi nahi sakte" (transliteration) (interview with VTSO 2)

> "Imagine the stress of the person who is sitting in the VTMS. Even a minor mistake can be a big incident" (interview with VTSO 3)

> "Sometimes it is stressful... there is high workload and no scope for mistake... reaction time is slow with ships, to start a movement takes time and to stop also it takes time so for safety we need accurate communication" (interview with VTSO 3)

> "The first priority is the VHF and the second is the telephone, and on the VHF, the first priority is the pilot" (interview with VTSO 2)

[75] Each ship is asked the notice/time it requires to reach the pilot station and this requirement is built into the arrival instructions given to the ship.

In addition to the VTS operators on duty, there is an office clerk, who works a 10 am to 6 p.m. shift. He works on the customised port software platform to log data onto the system. The software integrates and harmonises port operations, cargo, vessels and rail transport. Pilots come and leave their work reports with him and he inputs the information of pilotage services in the system. Among other things, the daily log of the ships serviced by pilots helps to remunerate the pilots. The work of the clerk is related to the work required of MahaDevi VTS operators because after the day’s shift is over at 6 p.m. and the clerk leaves the office, the VTS operator(s) on duty are required to update the log with the incoming new information. The VTS operators, in addition to monitoring traffic, complete the log from 6 p.m. to 10 a.m. until the clerk reports on duty the following morning.

In order to prepare for the day's work ahead of them, the VTS operators go through the programme for the day and to update themselves of the traffic movement during the previous shift, they go through the log registers in the office. In addition to monitoring traffic and speaking on the VHF radio, the VTS operators answer the telephone, update the electronic log of the port software (when the office clerk is off duty or when on leave) and fill in by hand several hardbound running logs. There is one main logbook in which all the movements are entered by the VTS operators. There is a separate logbook for inbound and outbound vessels. The outbound vessel log records internal movements in addition to the departures. There is no continuity between shifts and to achieve it, VTS operators apprise themselves of the current traffic scenario on their screens and go through all logs and information to prepare for their shift. The lack of continuity is a challenge which is overcome by VTS operators with prior preparation, however it highlights the lack of adequate technological support available to the operators, which will be further discussed in this section.

Prior preparation is required before taking VHF calls, especially at the beginning of the shift, as the VTS operators who had knowledge of what had happened in the previous shift have all gone home. The below mentioned transcript extract and field note demonstrate that the VTS operator on duty could not immediately make out the position of the vessel which was already at anchorage inside the port limits. The VTS operator in line 15 began by asking the vessel its present location and thereafter its destination when the vessel was already at anchorage inside the port. This highlights the lack of continuity between shifts as well as the lack of technological support available to the VTS operators. Instead of being completely informed about the location of each vessel in the VTS area, the VTS area operator asked the vessel itself about its current location.

Example 4.9: VTSO unaware of vessel location

10.**Mala 31** – MahaDevi Port control, *Mala thirty one*
11.**VTS –** *Mala thirty one*, VTS
12.**Mala 31** – Which channel speak sir?
13.**VTS –** *Mala thirty one*, go ahead
14.**Mala 31** – Sir we are going to try out our PP at anchorage position. We're going to try out our PP at anchorage position.
15.**VTS –** You are ↑at? (.) Your destination port is (.) *MahaDevi*?
16.**Mala 31**– We are already at anchorage sir. We are at Himalaya anchorage and we're going to try out our PP nozzle

Mala 31 called and the VTS operator did not know the location of the vessel. The VTS operator asked the vessel where it was and thereafter if it was bound for *MahaDevi*. The VTS operator was not aware that the vessel was at anchor inside the port and in this instance, did not come across as well informed (field note, 23 Dec 2010).

In line 12 of the above example (4.9), the seafarer clarifies the channel he should speak on and continues once he is told to *'go ahead'*. Speaking with the correct target on the appropriate channel is an important part of navigation safety which will be discussed further in chapters 5 and 6. The main focus of the *MahaDevi* VTS operators is the fairway and the movement in and around it. The *MahaDevi* VTS operators seldom pan their screens to zoom in and focus on stationary vessels in the various anchorage points on both sides of the channel. The topmost priority is the traffic movement in the fairway and in the immediate areas that can threaten navigational safety. Therefore, when the VTS operator received a call from vessel at anchorage inside the port, he was not immediately able to locate it as the software of the VTS technology marks stationary vessels with a grey circle and the vessel names also appear in grey. Therefore, it becomes difficult to locate them on the monitor as grey coloured names with overlapping grey circles and green radar echoes crowd the screen. Given the high density of vessels at anchorage inside the port, it takes time to positively locate a stationary vessel. It can be done by searching for the vessel by name. However, on a live radio call, the practice of ascertaining information from ships, persists. This points to a gap in the available technological support. Nevertheless a quick look at the previous day's logs would have informed him about the location of the vessel in the port. Going over the previous logs is one of the VTS operators' methods to accomplish continuity between shifts, however to expedite obtaining this information, they directly ask the calling vessels on the VHF about their location. This is somewhat similar to Harper and Hughes' (1993) study of the ATC in which an operator told the researchers that it would be virtually impossible to look at all the radar blips on the screen, therefore, the ATC would first take a look at the flight strip before ascertaining the location of the aircraft. Ascertaining vessel location highlights the role of technology within in situ VTS work, recovers technology for analysis and evaluates the inadequacy of current technological support, which can in turn inform design of supportive technology (Button 1993c).

Figure 4. 5: Stationary vessels in grey colour, marked by grey circles; anchored on either side of the main channel

Source: Student (picture taken and used with permission)

Content analysis of the transcript in ATLAS.ti (Computer Aided Qualitative Data Analysis Software (CAQDAS) software package) reveals that the question, *'where are you?'* has been used alone, as part of *'where are you now?'* and *'where are you going?'* 42 times. It is used by VTS operators (36 times), pilots (5 times) and ships (1 time) in the transcript. The usage of the question was visited in context to nuance this finding. The VTS operators have used it 36 times to ask vessels of their location, destination or programme. Apart from the 6 cases in which the vessels were outside the port limits, for the remaining 30 times, the vessels were in the VTS area and ideally the VTS operators should have been aware of the location because for as many as 20 times the question was posed, the ships were at anchor inside the port limits. This analysis does not aim to reveal that the VTS operators are unaware of the location of some of the vessels, because the VTS operators, at times, use this question to confirm what they already know (see example 4.10 below). The question was used 4 times in the transcript to confirm the VTS operators' knowledge about the traffic situation. The lack of awareness is explained in part by the lack of technological support, while more importantly this analysis reveals the emic (see

Pike 1967) in situ practice of questioning ships to proactively locate them in the VTS area (see Garfinkel 2002). This highlights the importance of placing actors in the VTS area for building situational awareness in a dynamic environment (see Brödje et al. 2010) and can be understood as a members' method utilised by the VTS operators to accomplish monitoring and VTS service provision.

Example 4.10: VTSO confirming vessel location

2135. **VTS –** where are you now? You are at number two anchorage point?

…

4340. **VTS –** where are you, number one anchorage, correct?

A common practice of the VTS operators is to paint a picture of traffic in the channel with words and give the surrounding traffic to vessels that call. This practice is introduced here but will be further explored in chapters 5 and 6. The following transcript extract is illustrative.

Example 4.11: VTSO painting a word picture of channel traffic

9390. **VTS –** Pilot M eleven is outbound on *Everest.* Present position is number one dock channel. He is outbound on *Everest*, Pilot eleven, and inbound traffic, *Sally one* dredger, inbound now, passing number eight line *Sally one*, and after that next inbound is *Faculty* passing outer red buoy now.
9391. **M37 –** Okay *Sally one* inbound right now near number eight line and *Faculty* at outer red buoy
9392. **VTS –** That is correct and *Trident* arriving pilot station one one three zero hours, she is also for the number one dock

Traffic monitoring is an important part of VTS operators' work. They closely follow the situation in the channel and at times categorically instruct vessels on how to pass leaving no room for confusion (example 4.12 below). Collision avoidance negotiations for passing, meeting and overtaking situations are further explored in depth in chapters 5 and 6. However, the crisp utterances/instructions of the MahaDevi VTSO leave nothing to chance and tie in with the emphatic theme of *"Hum unko samjhaa dete hai"* (transliteration), *"We make them understand"* (VTSO 1) explored in chapter 6, section 6.4.2.i, p. 222-227. This can be compared and contrasted with the verbose statements of the Singapore VTSO to Maersk Kendall (page 7) where he was unsuccessful in communicating the gravity of the situation to the Master and Chief Officer on the ship's bridge.

Example 4.12: VTSO; instructions on how to pass

21. **VTS –** *Graceful Lady*, VTS
22. **GL** – Yes *Graceful Lady* replying, over
23. **VTS –** Okay, you please pass red to red, port to port with the inbound vessel *Indy*

24. **GL** – Roger, copy. Inbound vessel, port to port.
25. **VTS –** *Indy, Indy,* VTS
26. **Indy –** VTS this is *Indy,* go-ahead Sir, over.
27. **VTS –** Pass port to port, red to red with the outbound tanker *Graceful Lady*.
28. **Indy –** Okay Sir, copy, port to port sir. Over

Vessels in the MahaDevi harbour talk to each other all the time to confirm how to pass (for the impact of AIS on increasing VHF communciation, see Bailey 2005; Bailey et al. 2008). The VTS operators believe that this practice enhances clear communication of intent (Goffman 1971, 2010 edition) and should be undertaken to clarify intentions and dispel confusion (see chapters 5 and 6). This needs to be seen in the light of IMO 'Rules of the Road' / COLREGs[76] which do not advocate that ships talk to each other for collision avoidance (IMO 1972) (also discussed in chapter 2). In the following excerpt, the MahaDevi VTS operator tells a seafarer that he can talk directly with another ship to confirm how to pass. The manner of the VTS operator's communication was that the seafarer on-board *Enchanting*, bothered him needlessly and that the seafarer should have directly contacted the other vessel in the first place. The below remark of the VTSO can be seen as downgrading in nature where he trivialises the vessel's communication to the VTS.

Example 4.13: VTSO and seafarer; inter-ship communication

740. **Enchanting –** VTS this is *Enchanting* I will keep this *Kajal twenty* on my port side I will keep this *Kajal twenty* on my port side
741. **VTS –** you can speak directly *Kajal twenty*. Channel fifteen stand by

The VTS operators interactionally action and achieve the Harbour Master's traffic plan and movement schedule on the VHF radio (see chapters 5 and 6). The VTS operators also reprimand vessels and exercise their authority. The role and function of reprimands is further explored in chapters 5, 6 and 7. If the VTS does not instruct a ship, then theoretically it cannot enter the channel. In the example below, the VTS reprimands the vessel for calling repeatedly especially when no one had told it to keep the engines ready.

Example 4.14: VTSO reprimands vessel

215. **Sevak –** VTS, MahaDevi VTS, *Sevak*
216. **VTS –** Who is calling VTS?
217. **Sevak –** Yeah VTS, good evening sir this is *Sevak*

[76] COLREGs - Collision Regulations

218. **VTS –** *Sevak* I'll tell you what time pilot will come, no need to call every now and then. I will call you and let you know
219. **Sevak –** Yeah I understand sir but my engines are running since three o'clock so I would like to know the status over
220. **VTS –** Nobody told you to get your engines ready. Shutdown engines and stand by one five
221. **Sevak –** Okay we can shutdown engines and stand by one five
222. **VTS –** Correct.

A ship called *Oil 29* had an open pilot booking and repeatedly called the VTS to get a pilot. The operator got irritated as he had been trying to tell the vessel that irrespective of the open pilot booking, the vessel could not sail out on the dark winter night.

Example 4.15: VTSO reprimands vessel

118. **VTS –** Do you understand that you cannot sail in the night as per the rules?
119. **Oil 29** – okay, we will inform back to the agent. This is the last question. Thank you very much. Standing by one five

At times, the VTS operators snap at seafarers when irritated. This does not occur often, however, the performed display of sarcasm and irritation (see Goffman 1959) exercises their authority and discourages vessels from calling repeatedly. In the example below, the VTS operator became irritated with a vessel which kept calling even after the VTSO had communicated that there were no further instructions and that it was required to anchor outside the port limits in the designated anchorage. On receiving repeated calls from the vessel, the VTS operator sarcastically taunted –

Example 4.16: VTSO; performance of sarcasm

VTS – You require a ↑pilot to drop anchor at outer anchorage?

The VTS operators perform hierarchy by reprimanding small crafts and ships that irk them for some reason or another but in reality they are lower ranked in the port[77] and at times are downgraded and made redundant on the VHF (see chapter 7) by their seniors. In the example below, the use of the word 'tell' by the Dock Master is telling in itself as he does not need to 'ask', he can 'tell' and he does so over the public VHF radio rather than the telephone. The instruction below is strange as all participants in the interaction have a radio set and in this instance there was no need to treat the VTS operator as a long distance trunk call operator, the

[77] The VTS operators do not feature on the organization chart of the port (see Appendix 10, page 300).

Dock Master could have gone ahead and made that call himself. The micropolitics of port communication will be elaborated in chapter 7.

Example 4.17: Dock Master's instruction to VTSO
1. **DM/HC –** VTS tell M thirty he can talk to me
2. **VTS –** M thirty, VTS
3. **M 30 –** VTS, M thirty
4. **VTS –** Harbour control wants to talk to you
5. **M 30 –** Control, M thirty

Ascertaining location of vessels in the VTS area, painting word pictures, instructing vessels regarding how to pass and reprimanding vessels are some of the members' methods utilised by VTS operators in the accomplishment of their work. Obtaining information about vessel location helps in the monitoring role of the VTS, while painting word pictures and instructing vessels on how to pass each other, helps to ensure separation between vessels and prevent accidents in the VTS area thereby contributing to safe traffic movements. Reprimands are utilised by the different members to accomplish different goals and are discussed in depth in chapter 7 on the micro politics of port communication.

The interaction of MahaDevi VTS on VHF is purposeful and directed towards helping safe navigation in the channel (see chapters 5 and 6). Sometimes, there is a great deal of near simultaneous communication in which communication can be lost. The VHF radio interface is not a telephone; there is no continuous dedicated interaction between the two communicating parties engaged in the act of navigation of the channel. The VTS operators and the ship's communicating officers cannot speak to each other for an extended length of time to clarify information or instructions. In order to explore the challenges which technology can pose to the VTS operators, an understanding of it is in order. The VHF technology is based on 'line of sight' transmission and uses simplex/half – duplex[78] communication. This implies that both sides are capable of communicating but not at the same time, hence the communicating parties need to take turns. The VTS operator would need to press a button to speak and transmit and can release the button to stop transmission. The same is the case with the shipboard radio equipment. This characteristic of the technology makes overlapping talk

[78] Simplex or half duplex communication refers to communication in which both sides can communicate but only one side at a time. In such communication words such as 'over' are used to designate the end of transmission from one side.

conspicuous by its absence as only one person can speak at a time. However this also means that the interaction between the VTS and ships is like innumerable subplots and to follow the communication thread between the VTS and the ship(s), the audio recording or its transcript would need to be studied in detail. If the researcher picks out each time a particular vessel is mentioned, the researcher can logically follow the communication thread of the vessel's journey through the channel; in other words, its subplot. The communicating parties have to remain alert each time their name is mentioned on air and respond appropriately. There are innumerable conversations going on at the same time between the VTS and different ships. From the point of view of a ship in the channel, the vessel would need to filter the information that is meant for it. Noteworthy here is that conversations between the VTS and other ships in the fairway are also relevant to obtain the traffic picture in the channel and hence a ship may have to be alert all the time and not just when its name is mentioned. Sometimes a vessel has to wait before it can get a response from the VTS as the VTS is engaged in the task of moving forward the several ongoing conversations with various ships and their subplots.

There is no face to face interaction between seafarers and VTS officers engaged in ship-shore radio communication. However, they are literally 'on air' for the audience attuned to the same channel for the duration of their utterance. To the inexperienced ear, on a superficial level, an utterance on VHF of either the VTSO or ship board seafarer would seem like an isolated/ divorced/solitary utterance. However, upon combining the threads together a logical picture of the traffic in the channel emerges through words in interaction. A traffic picture is created interactionally and emic rationality is displayed by the participants to safely negotiate the channel.

The challenges faced by MahaDevi VTS operators while communicating on the VHF radio are related to issues with technology (lack of suitable/appropriate technological support), the social organisational challenge posed by entrenched hierarchy (chapter 7), issues of language – accent, pronunciation and the ilk (see chapters 5 and 6). The MahaDevi VTS does not use the IMO Standard Marine Communication Phrases (SMCP) to communicate with ships (see chapter 6, section 6.4.3, p. 229-231). However, it does use relatively straightforward/ predictable and standard sentences, which helps streamline ship-shore VHF communication along predictable lines to promote navigation safety, discussed further in chapter 6.

A recurring theme in the work of MahaDevi VTS operators is security. While the VTS operators in the UK did not mention security as an issue in their work, the VTS operators in India (in both the pilot and main study) mentioned security as an aspect of their work. Security concerns the VTS operators and is explored in the following section.

4.4.2 VTS and Security

Terrorists used the sea route for the 26 November 2008 attack on Mumbai. The terrorists had set sail from Pakistan and on reaching Indian waters, hijacked a local fishing vessel and abandoned their own craft before entering the city. They alighted at the Gateway of India and made their way to the various pre-selected targets (see Duraphe 2009). Over the next three days, targeted areas in the city were under siege. What was of relevance to the government was that this attack exposed the vulnerability of terrorist attacks by sea. After the 2008 terrorist attack, joint operations were set up between the Indian Coast Guard, the State police, the Port Trusts and the Indian Navy.

The terrorist attack had a direct impact on the VTS offices of ports along the coast of India as they were required to adopt a higher security level with respect to the ISPS[79] code (International Ship and Port facility Security) (IMO, 2003) and the VTS operators were to be extremely vigilant on duty. The threat of terrorism in India is very real and security issues are paramount for the country's ports. The security concerns of the VTS operators come to the fore in their everyday work.

> "It is the 24 hours duty we are monitoring the system...if somebody enters without our knowledge, we have to intercept. To interpret and we have to make out which is the vessel. What is the purpose? Where she is going?" (Interview with VTSO 4)

In the example below, the VTS operator snubs the seafarer who wanted to know the code of a naval submarine sailing in the area. The VTS operator reprimanded the Seafarer that he need not concern himself with the code. The focus should be on taking evasive action to avoid navigational incident in the channel and not on obtaining (perceived) security sensitive information. This example reflects upon the heightened sense of security in the VTS office.

[79] ISPS Code- International Ship and Port facility Security code was developed in the wake of the September 11 attacks in the United States of America. The ISPS code was ratified by the member governments in 2002.

Example 4.18: VTS and security concerns

415. **Ship –** There is an inbound submarine. What's its code?
416. **VTS –** Course or port?
417. **Ship –** Code sahib, code. I think they have Papa something? (translation – sir)
418. **VTS –** That you cannot ask and you should not be concerned regarding that code. You can call directly inbound submarine.
419. **Ship –** They're earlier they were doing five knots something and now they are just right ahead of me.
420. **VTS –** OK you have to keep clear of the submarine. That is your first priority

Example 4.18 (line 418) is also interesting from the point of view of the use of VHF for collision avoidance, as the VTS operator suggests to the seafarer to directly contact the submarine (see chapter 2 on literature review and chapters 5 and 6 for the practice of using the VHF for collision avoidance). Even though the use of VHF for collision avoidance is discouraged and is antithetical to COLREGs, it is omnipresent in my data and is further explored in the following two chapters (5 and 6) (also see Bailey 2005; Bailey et al. 2008).

In the example below, the VTS operator monitored a vessel which had left the channel to reach an anchorage point outside. The VTS operator called the ship and asked –

Example 4.19: VTS and security concerns

VTS – Yeah, ↑why have you anchored outer anchorage now? ↑What is your purpose? You gave your next port of call (.) somewhere (.) Iran. So why are you waiting there now? Over

Upon ascertaining that the vessel was waiting for further instructions, the VTS operator instructed it to inform once it left the area.

On one day, during the course of my fieldwork an alleged terrorist craft entered the channel –

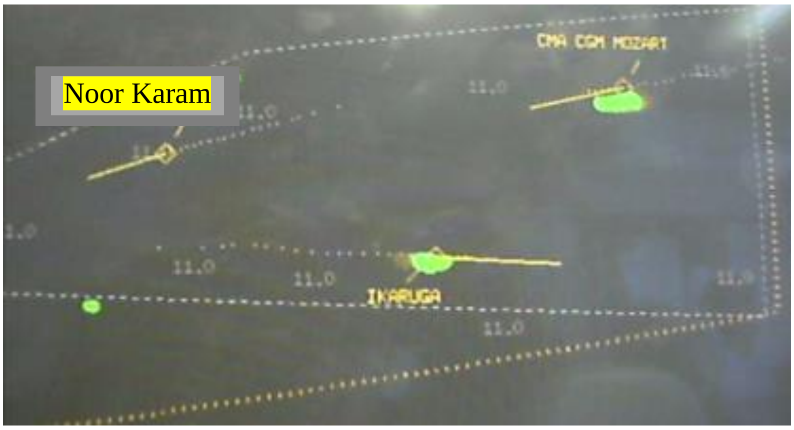
> AIS picked up a vessel, *Noorkaram* entering the channel. The VTS operator called the vessel several times but received no answer and it appeared that it was either not maintaining a watch on VHF channel 15 (port working channel) or simply not answering. On their screens the two VTS operators in the office saw the vessel move further up the channel. Of the two VTS operators in the office, one immediately got up and left to personally inform the Dock Master Control Station's office saying that there would be trouble[80], if four Pakistanis[81] were to enter. The other VTS operator immediately spoke to

[80] There was a report in the newspapers that there was a credible threat of an attack by LeT (Lashkar e Taeba) during the Christmas holiday season in India.

[81] The VTS operator mentioned the nationality of the crew of *Noorkaram* as Pakistani, thereby equating terrorists with Pakistan. This is to be seen in the light of the fact that the terrorists who had attacked Mumbai were from

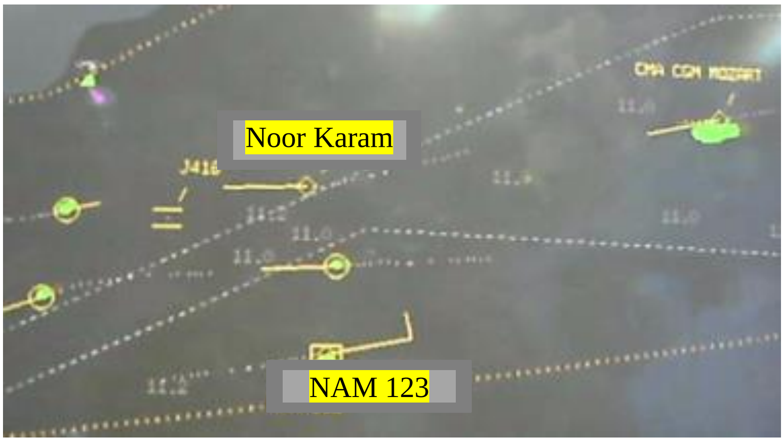
other vessels in the vicinity to positively identify the vessel and the type of craft it was. *NAM 123*, a vessel in close proximity to *Noorkaram* positively identified the vessel and said that it was a small craft like a dhow. Subsequently it was revealed that *Noorkaram* was a small craft which supplied onions and potatoes to the bunders (docks) and not the alleged terrorist craft that had heightened tensions in the VTS office (field note, 23 Dec 2010).

Figure 4. 6: A section of the VTS monitor showing *Noor Karam* enter the channel



Source: Student

Figure 4.7: Noor Karam further up the channel. NAM 123 can be seen in proximity



Source: Student

In the case of *Noorkaram*, AIS had picked up the vessel. In most cases, small craft like water barges do not usually have AIS fitted and their radar echoes appear as green dots/radar echoes[82] on the screen. Security is an important concern for the VTS and it is accomplished by the VTS operators through monitoring the traffic on their screens and monitoring the interaction on the VHF radio.

Pakistan and had come by the sea. The Islamic name of the craft did not help given the lack of trust in India against Islamic terrorists mostly from Pakistan (for Islamophobia, see Bleich, 2011, Sheridan, 2006).

[82] The size of the Green dot (radar echo) on the screen depends upon the size of the vessel. A bigger vessel will have a bigger echo/dot and a smaller one will have a small echo. A radar echo will be picked up even when the AIS on-board has been turned off. Direction vectors are displayed with radar echoes for moving vessels.

4.4.3 Training and Certification of MahaDevi VTS Operators

The training and certification of VTS operators in India is not in accordance with the V103 (IALA 2005) followed in the UK and across Europe. The MahaDevi VTS operators have not received any training in Maritime English, they are not aware of the Standard Maritime Communication Phrases (SMCP), Standard Maritime Navigation Vocabulary (SMNV) or SEASPEAK. They do not refer to their services as Information Service (INS), Traffic Organisation Service (TOS) or Navigation Assistance Service (NAS) (IALA, V-103 terminology) and do not use VTS technical phraseology such as *'situational awareness'* etc. The background of the VTS operators helps to explain this further. The VTS operators recruited into MahaDevi are from two separate streams; ex-defence and ex-merchant Navy. A VTS operator recruited could be an ex-Indian Navy seaman or an ex-merchant Navy Radio Officer[83]. The training background and the certification for the two streams are vastly different. The ex-defence personnel have been trained by the Signal Corps of the armed forces and the ex-merchant Navy radio officers have a certificate in radio communication from an Indian Maritime College.

> "During my time at sea, they had started the training in Maritime English for officers… all procedures followed here are standard international radio telephony procedures." (Interview, VTSO 5)

For both streams of VTS operators, the main focus of their training had been on operating radio equipment and international radio-telephony communication procedures. The focus of their training had not been on the holistic provision of VTS services. The MahaDevi VTS operators had received on-the-job training, some of them had even gone abroad to the office of the Europe based VTS provider who had installed the VTS system in MahaDevi, but the training had largely focussed on the equipment of the VTS system and not on the provision of VTS as a service embedded in the larger context of risk, safety, service provision, society, environment and legal liability. From late 2013 and 2014 onwards, training in India for VTS operators will be on the lines of IALA V-103 and steps are being taken for the provision of such training in the country (GOI 2013).

[83] Currently this position does not exist on-board as the Radio Officers were made redundant by most companies as external communication was entrusted to officers of the bridge team.

To nuance VTSO training, I take the example of Navigation Assistance Service (NAS)[84] provision in the port as it is a safety critical service and exploring it can reveal insights about the training of VTSOs and the practice of providing the service as it compares with IMO (1997b) guidelines. NAS is to be provided when requested by a ship or when deemed necessary by the VTS in the interest of safety. It is usually required in difficult navigation situations or when a vessel is experiencing defects or deficiencies (see IMO 1997b; IALA 2008, 2012).

> When the VTS is authorized to issue instructions to vessels, these instructions should be result-oriented only, leaving the details of execution, such as course to be steered or engine manoeuvres to be executed, to the master or pilot on board the vessel. Care should be taken that VTS operations do not encroach upon the master's responsibility for safe navigation…(IMO 1997b, p. 7)

The MahaDevi VTS provides the NAS service, when required, but is very direct in its approach such as providing an exact course to steer (example 4.20). This practice diverges from the IMO (1997b) recommendations which suggests that the instructions should be result oriented and execution should be left to decision makers on-board. In the example below the VTSO saw the direction vector of *Michael* move out of the channel where the depth of water was less and in the interest of safety gave it a course to steer to come back into the channel.

Example 4.20: VTS; NAS provision

62. **VTS –** *Michael*, VTS
63. **VTS –** *Michael*, *Michael*, VTS
64. **Michael –** VTS, VTS, *Michael*,
65. **VTS –** Yeah *Michael*, what is your course now?
66. **Michael –** two, nine, zero (.) two, nine, zero
67. **VTS –** alter to two, five, zero (.) two, five, zero
68. **Michael –** two, five, zero, okay
69. **VTS –** yeah, steer two, five, zero

Two VTS operators were in the office. VTSO 5 spoke to *Michael* on the radio and VTSO 2 turned to me and said, *"He asked her to stay in the channel. They are supposed to have a chart on board but she is not complying"*. After the call, VTSO 5 said, *"We are not supposed to give any particular course because we are not knowing whether*

[84] The MahaDevi VTS operators provide NAS services according to the interaction on the VHF radio. However, the VTS manual uploaded on the MahaDevi port website in 2013, two years after my fieldwork state that the port provides INS and TOS services and does not list NAS. A year after my fieldwork in 2011, navigation guidelines were uploaded on the port website which make the first mention of the VTS online, whereas the service has been in the port since the late 1990s (year of installation withheld to preserve anonymity).

> *there is a fishing boat or anything is there or not. So we are forced to give a course because she is not bothered to maintain the course"* (field note, 21 Dec 2010)
> .

Noteworthy is that VTSO 5 says that they are not supposed to give a course to steer to ships. IMO (1997b) guidelines require that VTS instructions should not encroach upon on-board execution while the VTSO reasons that he should not give a course to steer as there could be other craft in the vicinity he is not aware of, but he was forced to give a course in the interest of safety. There are also issues of legal liability to be addressed if something happens as a consequence of following instructions provided by the VTSO. NAS provision in MahaDevi highlights the training gap of VTS operators with respect to the IALA-V103 and the divergence of their practice from IMO (1997b) guidelines for VTS. NAS provision with explicit execution instructions is utilised by VTS operators to ensure safe traffic movement.

The direct, matter-of-fact instructions of MahaDevi VTS operators are in stark contrast to the verbose utterances of the Singapore VTSO (see *Maersk Kendal*, Page 8) and the reluctance of the Swedish VTSO to communicate any more information than required by protocol/mandate which could not prevent the grounding of the *Stena Danica* (SAIB 2010; Brodje et al. 2013). In line with this finding (direct micro managing utterances), training in line with the IALA V-103 for the VTS operators is recommended to appreciate the broader context of VTS service provision and appreciate the legal aspects of their utterances (see chapter 8). The purpose of my research is to reveal the in situ practices and it is for the port authority and navigation experts to evaluate the impact of direct NAS instructions (example 4.20) on safety. The directness of the MahaDevi VTSOs also comes across in their instructions pertaining to anchoring (explored in chapter 5).

The Harbour Master believes that navigators are more suitable in the VTS office as they would know where the ship's master was coming from (see Lutzhoft and Bruno 2009). The Harbour Master cannot recruit experienced navigators for the VTS office given the budget constraints he is under and VTS operators believe that no navigator would like to work on a clerical grade and a nominal salary. The (perceived inferior) training of VTS operators accounts, in part, for the performance of rank, status and hierarchy on the port radio (see chapter 7).

The MahaDevi VTS operators manage marine traffic in a complex environment in one of the busiest ports in the country. They feel that the workload, stress and pressure of their job is not compensated by their clerical grade and salary. Their status is lower than that of officers in the port. Sometimes they feel pressurised, belittled, humbled, embarrassed or irritated by the internal communication taking over the main VHF channel when ideally, communicating with ships on VHF channel 15 should be their domain. Chapter 7 discusses the micro politics of port communication in detail. In the following sub-section, I turn to the Dock Master who is a very large presence on the marine radio.

4.5 The Dock Master

The VTS office is directly under the control of the office of the Dock Master, Harbour Control Station. The Dock Master's office is on the same floor as the VTS operators. From his office a few doors away, he monitors the main radio channel of the port (channel 15) and the internal channel for the workings of harbour control. The Dock Master has a larger-than-life presence both in the VTS office and on the marine radio. He is one of the key social actors communicating on the radio, and exploring his role contributes to our understanding of the procedures and practices for traffic scheduling, navigation safety in the harbour and the interpersonal relations between the Dock Master and the VTSOs (see chapter 7 on the micro politics of port communication).

The Dock Master of the Harbour Control station is responsible for ensuring the safe and timely movement of traffic in the harbour. A senior pilot, he sometimes carries out pilotage assignments for the port. Among other things, his office ensures that pilot launches are made available to pilots in time for pilotage. The pilot launches are limited in number and the Dock Master is continuously engaged in making decisions in real-time about assigning ships to pilots based on the location of the launches and the pilots in the channel/harbour. The following example shows the constant preoccupation with the optimal utilisation of resources (pilots and pilot launches) and the real-time decision-making that accompanies it. In line 37, example 4.21 the Dock Master asks if pilot M 22 has passed central ground and while the VTS operator is still checking, in line 39, he asks another question if pilot M 5 has left the dock. In line 40, the VTS operator provides the location of pilot M 22 and confirms that pilot M 5 has left the dock. Line 37 is noteworthy as the Dock Master instructs the VTS operators to tell him which pilot was ahead when they would pass central ground[85]. In line 35, the VTS operator makes a telling comment off air, that the Dock Master will drive him crazy. On the one hand, it is an amusing casual backstage performance (see Goffman 1959; Mullany 2011) and on the other, a reaction to the incessant demands on the VTS operator and his irritation with internal communication being conducted on the port's main radio channel. The use of the main radio channel for internal communication, ancillary communication and the rank, status and hierarchy of VTS operators in the port will be taken up in chapter 7 on the micro-politics of port communication.

Example 4.21: VTSO, Dock Master and assigning pilots to ships

34. **HC** – VTS, Harbour Control
35. **VTS** – Arrey pagal kare (off radio) (transliteration) He'll drive me crazy (translation)
36. **VTS** – Harbour Control, VTS
37. **HC** – Has M twenty two passed central ground?
38. **VTS** – One minute, one minute, just check
39. **HC** – Has M five left dock?
40. **VTS** – M twenty two now passing East buoy and M five left dock
41. **HC** – When they are passing central ground, let me know who is ahead

Both the Dock Master and the VTS operator display emic rationality (see Pike 1967) in their communication. The Dock Master's questions pertain to the individual pilots while the VTSO checks for answers based on the ship names. The VTS operator is aware of the ship each pilot is piloting. The VTS system provides the real-time location of ships in the harbour and displays their names on the computer screen. The VTS operator checks his console for the exact location of the ships and reports to the Dock Master. The above interaction aids the Dock Master in assigning subsequent pilotage assignments. The knowledge of the location of port resources such as pilots and pilot launches is important for the Dock Master to carry out his institutional role of assigning these resources to ships requiring pilotage. In order to obtain this information, the Dock Master calls the VTS on the VHF and this can be considered as a method for accomplishing work.

Expeditiously planning the movement of ships is one of the key concerns of the Dock Master. He had been talking to one pilot on the VHF, saying that between him and another pilot they could cover two vessels, to which, one VTS operator commented –

[85] The information helps the Dock Master to assign pilotage duties and organise the embarking and the disembarking of pilots with the aid of pilot launches.

> "He wants to expedite the job but still he does not see how the things are complicated. It becomes very difficult for us to control" (Interview VTSO 3).

The VTS operators' above comment highlights the difficulty he and his colleagues face in maintaining control to ensure safe and efficient traffic movements when they are interrupted by the Dock Master. At times the VTS operator is interrupted when the Dock Master gives an instruction on the main VHF radio. In the following example, the VTSO is talking to a ship called *Beta* when the Dock Master gives an instruction in line 43 which makes the VTSO redundant as he has to repeat what the vessel has already heard on the main radio. Externalising the internal communication as well as public rebukes/reprimands will be explored in chapter 7.

Example 4.22: Dock Master interrupting VTSO mid call

42. **VTS –** *Beta*, you please alter to starboard, easterly direction. East direction and then stop your engines, wait there
43. **HC** – Inform him that there may be a delay of half an hour before pilot boards him
44. **VTS –** Okay *Beta*, VTS
45. **Beta** – VTS, *Beta* go-ahead
46. **VTS –** Maybe half an hour delay. Thirty minutes, thirty minutes delay so you please stop the engines. Alter to starboard and stop the engines

With respect to the internal talk on the main channel, one VTS operator said –

> "Vessel would be confused moreover we are disturbed"
> (Interview, VTSO 2)

The Dock Master, carries out internal/ancillary communication and performs knowledge displays on the VHF that can downgrade the VTS. He also performs his rank, status and hierarchy on the radio (see chapter 7). I argue that such conduct on the port's main radio channel poses a challenge to the VTS operators in the performance of their work and is taken up further in chapter 7. In the following section I turn to the harbour pilots who undertake pilotage assignments in the port, bringing ships in and taking them out, as the case may be.

4.6 The Harbour Pilots

Pilots are an important group in the port. They work under the Harbour Control office which plans and schedules their pilotage assignments and accordingly allocates resources. The pilots have a Master Mariner's license and undertake special training in the local waters to qualify as a pilot. There is compulsory pilotage for all ships calling at MahaDevi. Since the port has 24-

hour operations, pilotage services are provided round the clock. Pilots go for their pilotage assignments on pilot launches and thereafter embark ships using the pilot ladders rigged by the ship's crew as instructed by the VTS and/or the pilot (see appendix 11, page 301). This section discusses some examples to contextualise the role of pilots in the harbour.

Pilots interact with the VTS operators largely on the VHF radio and at times they come into the VTS office to drop off their pilotage work reports and chat briefly with those on duty. The harbour pilots talk to the ships and the VTS to interactionally achieve safe navigation in the harbour. The pilots talk to the VTS at certain key communicative stages in the vessels trajectory which will be empirically explored in chapters 5 and 6. In addition to the talk taking place at key communicative stages, pilots interact with ships, other pilots and the VTS to contribute to the dynamic situational awareness of all listeners. Pilots are integral to achieving safe navigation.

The marine radio is a kaleidoscope of rich communicative contexts (see Atkinson et al. 2008) and reveals facets about the life and work of social actors in the port. The harbour is the space where the pilots spend a substantial part of their working lives; it is where they work, rest, eat and do mundane things like forgetting their reading glasses on-board. In the example below the VTS operator tells a dredger that the pilot launch will be coming to collect the spectacles of the pilot who had left them on board during pilotage.

Example 4.23: The pilot leaves his glasses behind[86]
VTS – *Kajal*, abhi launch aapke paas aa raha hai. Sahib ka jo chashma, Specks hai na aapke paas. Sahib ka kuch cheez hai na aapke paas. Pilot launch jo hai pilot launch aapke paas aa raha hai. Abhi aap dredging area mein hai na?

VTS – *Kajal*, the pilot launch is coming to you. Sahib's spectacles, specs that are with you. You have something of sahib's. Pilot launch, pilot launch is coming to you. You're in the dredging area now. Right?

Example 4.23 above, is not directly related to the institutional work of the VTS operators, however it engages the VTS operator in ancillary work, occupies air time on the marine radio and utilises port resources which would otherwise be deployed in carrying out official work.

[86] The glasses have been left on-board a local dredger and thus can be retrieved easily.

This example is provided to contextualise the layers and textures of the work environment in the port.

Visibility is very important to pilots when navigating ships in the channel. In poor visibility conditions, the pilots actively confirm the manner in which they will pass traffic they encounter. Negotiations on passing, meeting and overtaking situations are discussed in detail in chapters 5 and 6. The following two examples pertain to communication in poor visibility conditions on a cold hazy winter's day. In the first example, the pilot wants to know about traffic in the channel and in the second, he wants to pass perpendicular and well clear of a local dredger, leaving no room for confusion.

Example 4.24: Pilot enquires about traffic in poor visibility
Pilot – Visibility is very poor. Maybe half a mile so. I would like to know first any traffic in the tanker channel and then North South of first buoy in the main channel

Example 4.25: Pilot-ship communication in poor visibility

9478. **Pilot** – Because visibility is poor, we can't see you, so you please make sure we cross perpendicular. Don't steer course ten, ten degrees
9479. **Dredger** – Roger Sir after pass the channel, then I will call you again
9480. **Pilot** – Right you cross the channel. You can. Present course is what, zero three zero?
9481. **Ship –** zero three five
9482. **Dredger –** Good you keep clear of all ships and go to port. Please make it about something three three zero
9483. **Ship –** Okay Sir

Obtaining traffic information in and instructing a vessel on course in poor visibility are used as methods by the pilot to avoid accidents and navigate safely. The VTS does not intervene in the interaction above (example 4.25) as a knowledgeable local pilot is instructing a vessel. Direct communications that encroach upon on-board decision making and attempt to micro manage shipboard response are sometimes carried out by the VTS and pilots in MahaDevi port. This practice is pervasive and requires further expert evaluation. In a similar vein a pilot calls a ship to give advice on navigation.

Example 4.26: Pilot-ship interaction

799. **Pilot –** *Enchanting*, pilot
800. **Enchanting –** pilot, *Enchanting*
801. **Pilot –** just be in the channel you can see right ahead of you is the wreck, just be careful go in the channel only, don't go more to port

802. **Enchanting –** I won't go to port, just starboard only, I just crossed that *Kajal Twenty* and when she comes on my bow I'll come back to port. I will keep the red buoy on the starboard side, the buoy on the starboard side I will
803. **Pilot –** you can come on the course, *Kajal* will be clear don't worry about him
804. **Enchanting –** okay sir, okay

Sighting and confirming the visual contributes to the interactional negotiation of confirming passing agreements (chapters 5 and 6). In the example below the pilot and *Sandy* sight each other and confirm visual and agree on passing red to red. Physically sighting the target and passing confirmation is a visible and accountable feature of the work of pilots.

Example 4.27: Pilot-ship interaction

1. **M 7 –** *Sandy,* pilot M seven
2. **Sandy –** good morning sir. Red to red
3. **M 7 –** Yeah we'll do red to red. I haven't sighted you yet. You have sighted me?
4. **Sandy** – sighted.
5. **M 7** – Okay red to red.
6. **Sandy** – Thank you, Sir.
7. **M 7** – Yeah okay *Sandy,* seen you. *Sandy*, seen you. Red to red
8. **Sandy –** Thank you, Sir.

The harbour pilots are high ranked in the port and sometimes this rank differential comes through on the VHF radio. The rank difference and reprimands will be discussed in chapter 7, on micro politics of port communication. In the example below, the pilot is dismissive of the seafarer when he attempts to give his GPS position in latitude and longitude. The seafarer was attempting to answer what had been asked of him (line 61).

Example 4.28: Pilot dismissive of seafarer

59. **Pilot –** *Oslo,* pilot
60. **Oslo –** Pilot, *Oslo*. Good evening, Sir
61. **Pilot –** What's your position?
62. **Oslo –** GPS position one nine degree
63. **Pilot –** forget this one eight. How much distance from pilot station?
64. **Oslo –** Longitude zero five one degree four one five decimal zero East. Over.
65. **Pilot –** Oslo I want to know how much distance from pilot station?
66. **Oslo –** Roger distance from pilot station about three miles Sir. Three miles, over

Example 4.28 highlights the preference of the pilot for basic information over technical; for example, distance preferred over exact GPS coordinates. Unlike the VTS operator, the MahaDevi pilot, waiting for a ship in a pilot launch does not have access to high tech equipment.

This points to the lack of technology at the disposal of the pilot as well as to the performance of the perceived rank differential between the pilot and the shipboard seafarer.

The pilots are civilians who can be called upon to pilot a newly built vessel acquired by the Indian Navy, in which case they would have to berth the vessel in the defence docks. The security climate in India post the 26 November 2008 attack is heightened. At the time of my fieldwork, ports along the coast of India were maintaining ISPS level 2 for heightened security and one civilian pilot found himself at the receiving end when the pilot launch was repeatedly intercepted and not permitted entry to the defence docks to disembark the pilot.

Example 4.29: Civilian VTS and Navy Control

10482. **VTS –** Navy control, Navy control, VTS
10483. **NC –** VTS, Navy control. Good afternoon Sir
→ 10484. **VTS –** Good afternoon Navy control, the pilot who has taken *Asmi* alongside is there in defence dockyard. The launch is there, *Aabha*. He is not allowed to take, he is not allowed to take pilot on-board. Tell your people over there to allow the, allow the *Aabha* to take the pilot back over.

…

10514. **M 7 –** VTS M seven
10515. **VTS –** M seven, VTS come in
→ 10516. **M 7 –** VTS just inform Navy control I think again that boat is going to intercept *Aabha*. This way we cannot work over here.

…

10530. **NC –** Roger being informed
→ 10531. **VTS –** Yeah do it quickly. Pilot is required earliest here. We can't just keep holding up

…

10566. **M 7 –** Navy control, pilot
10567. **NC –** Pilot, Navy control
→ 10568. **M 7 –** Yeah thank you. I have disembarked now but we had a lot of problems. Thanks a lot. I am on my way back
→ 10569. **NC –** Okay, sorry for inconvenience sir because exercise is going on. That's why this unpleasantness happened
10570. **M 7 –** No problem

The interaction between the civilian VTS and navy control is similar to Harper and Randall's (1992) study of ATC in which military 'rogue' planes were identified by civil ATC and conflict resolution initiated with the military counterpart. Similarly, conflict between the civilian pilot launch and the navy patrol boat is resolved by the VTSO together with the navy counterpart. Conflict and resolution, are both accomplishments and hence, accountable features of work.

This section introduced the pilots as an important group in the port, it discussed their role in navigation safety to pilot ships in the channel and highlighted some of the interaction they have with other social actors in the harbour. From the pilots, I turn to the colourful fishermen/local seafarers sitting on board their small craft who sometimes abuse the marine radio to kill time.

4.7 Of Obscenities and Fishermen[87]

> Under the night sky in the harbour, after a long day's work, fishermen and seafarers aboard small craft go on air. It appears they have nothing better to do than to while away time and abuse the marine radio. It makes for uncomfortable listening. The (largely) business like institutional talk of the day is pushed aside to make room for these men who want to broadcast. It is a stark contrast as the day and the night are binary opposites on the radio soundscape. While greetings - 'good morning/afternoon/evening' and institutional talk feature on the VHF in the day, the night is heralded by swear words (field note, data reflection, 24 Jan 2010).

A theme that emerged pertaining to VHF technology was the concern for its unregulated use and the abuse of VHF channels. The VTS operators felt that if a channel was allotted to the port as the main working channel then it should not be given to users like the fishermen. It was believed that all sea goers need a VHF as there would be no mobile signal for a fisherman out for the day's catch. However, it was felt that some users were not aware of the importance of the port working channel and misused it by swearing on it, talking for recreation, singing, joking and airing music on it. Such misuse sometimes crowds the channel and makes it difficult to get through – in which case the VTS operators would instruct those (ab)users to leave the channel free[88]. The Marine Guidance Notice (MGN) number 22 (MCA 1998), issued by the Maritime and Coastguard Agency, UK *'warns against improper use of VHF channels at sea'*.

> The International Maritime Organisation (IMO) has noted with concern the widespread misuse of VHF channels at sea especially the distress, safety and quality channels 16 (156.8 MHz) and 70 (156.525 MHz), and channels used for port operations, ship movement services and reporting systems. Although VHF at sea makes an important contribution to navigational safety, its misuse causes serious interference and, in itself, becomes a danger to safety at sea. IMO has asked member governments to ensure that VHF channels are used correctly.

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[87] I was told by the VTS operators that the fishermen misuse and abuse the channel primarily at night.

[88] The VTS operators believe that the main working radio channel for the port should not be programmed on VHF handsets of users like the fishermen and local seafarers of small craft, who mostly procure second hand equipment from ships being scrapped. As there is no regulation governing the sale and programming of VHF sets, this trend is likely to continue.

The Marine Guidance Note provides guidance on the *'proper use of VHF channels at sea'* and does not enumerate the different kinds of misuse the VHF may be subject to. In this section, I highlight the abuse of the marine radio by miscreants who use the radio to air foul language, play their choice of music and engage in frivolous banter. While on the surface, the misuse may come across as harmless, occupying airtime on the channel meant for critical safety communications introduces risk in the complex social-technical systems (see Nuutinen et al. 2007). The abuse of the marine radio is highlighted to contextualise the work environment of the VTS operators.

A derogatory reference is made to females in a seafarer's family, who are depicted sitting in the marketplace soliciting clients and the person goes on to ask if the seafarer's mother has found someone. This is to be seen in conjunction with the idea that virginity and sexual fidelity are prized possessions in a patriarchal society such as India (for Turkey, see Dundes et al., 1986) and therefore the insults, question the character of the females in the seafarer's family to humiliate and discredit the male.

> *Chup kar bhosdi ke, madar chodh* (transliteration)
>
> Shut up, cunt engendered mother fucker (translation)

> *Teri maa aur teri behen bhindi bazaar baithi hai kya besura...teri ma ko koi mil gaya?* (Transliteration)
>
> Are your mother and sister sitting in the market place, you discordant singer...has your mother has found someone? (Translation)

> Insult– *Madar chod. Kaun bol raha hai? Teri ma ki chhut* (transliteration)
>
> Response – *Tera baap bol raha hai.*
>
> Insult – Mother fucker. Who is speaking? Your mum's cunt (translation)
>
> Response – Your father is speaking

Foul language, abuse and swear words are integral to the night time soundscape of the port radio. The social actors mouthing profanities and being vulgar on the marine radio are mostly poor uneducated fishermen aboard their small craft, killing time under the night sky. The foul language largely contains derogatory references to women and their private parts. The profanities of, *"mother fucker"* and *"sister fucker"* pierce the night sky and momentarily seem to hang suspended in the air. A person is insulted on the radio by saying that his wife will sleep with someone else and he would be cuckolded and left alone to masturbate. It is beneath the dignity of the office of the VTS and the harbour pilots to respond on hearing any profanity. The silence of the VTS operators and the harbour pilots excludes the fishermen from the institutional accomplishment of navigation safety in the channel. The fishermen are not a part of port operations; however, they can and do take centre stage and perform live by virtue of the radio(s) in their hands. Their profane performance is ignored by the VTS operators (as far as possible)[89] and harbour pilots who go about their business as usual as if nothing untoward has happened and it has not affected them in any way. There is dignity in the silence of VTS operators and pilots who do not react to the foul language. However, small crafts/barges that regularly ply in the harbour servicing ships have no such reservations. A small water barge had been trying to call the merchant ship *Liberty 101* for quite some time. The barge had called several times but was unsuccessful in getting a response from the ship. His repeated calls on the radio irritated one, who swore at the seafarer (on-board the water barge) by referring to the private parts of his mother and sister. The seafarer was touched to the quick and responded with a counter insult that the person who insulted his mother and sister would be homosexually assaulted.[90]

The foul language that interrupts the institutional language of port operations in the night is one of the several binary oppositions in the port (see Atkinson et al. 2008). In the light of day, no profanity is mouthed but it becomes a part of the night time soundscape. The fishermen mouthing obscenities may not be a part of the official performance of the port operations but they occupy and affect the night time soundscape thereby becoming a part of the life world of the VTS operators as the latter have no choice but to listen to the main working channel of the port being misused. In connection with the obscenities, I was told that at night the fishermen use swear words and the VTS operators do not react because,

"If we say something then they would do it even more" (interview with VTSO 6)

None of the VTS operators mentioned any of the foul language used by the fishermen in my presence (I heard it from my recordings). They did tell me that the language used by fishermen at night was bothersome.

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[89] For an appeal to the sense of shame of the persons abusing the marine radio, see example on page 94, the opening page of this chapter.

[90] See example on page 94, the opening page of this chapter.

> *"Raat ko kya bolte hai yeh log. Baap re baap"* (transliteration)
> "What all do they say at night. Oh my God!" (translation)
> (Interview with VTSO 7)

This section presents the presence of foul language in the soundscape of the marine radio and the life world of VTS operators. I did not hear foul language from the VTS operators, nor did I hear it being spoken over the radio during the day. My fieldwork in the VTS office did not involve night time fieldwork in the interests of personal safety and I heard the obscene language while listening to the audio recordings after my fieldwork was over (my recorder would be left overnight in the recording room, see chapter 3 on methods). Listening to the foul language and translating it for my thesis made me uncomfortable. Loud whispers, abuses and curse words are out of place on the marine radio and make for uncomfortable listening. At night, in addition to the cuss words, music features prominently on the radio, which is discussed in section 4.8.

4.8 Melodies in the Harbour

A female voice croons and fills the night sky in the harbour. The working channel of the port is suddenly transformed into an entertainment radio channel. The melody has a captive audience in the port as the listeners are forced to listen to a song that may not be of their choosing. The female voice sings of restlessness in love and wants her love and restful sleep returned to her. Just as swear words feature at night on the port radio, similarly melodies are played on the marine radio for the entertainment of the fishermen at night. One fisherman would play the song and broadcast it on the Marine radio, while another would appreciate it by saying, *'achcha hai'*, (translation – *'it's good'*). The songs played at night are usually love songs. A male voice sings that God willing, his lady love should also fall in love with him. In another song the male singer tells the female that he does not know what she has done, as he is not the same since he met her. In another song the male voice sings that he has come to steal his lady love's heart. One is reminded of lovers singing and dancing around trees in Bollywood films and the gyrations that accompany the pulsating beats. As with abuses, the VTS operators and the pilots do not pay any attention to the songs and go about their work as usual. At times the pilots and VTS operators try and speak when the song is being aired and it is difficult to carry out a meaningful sustained interaction when a song is playing. One solution is to persevere and continue to call each other and interact. Another is to switch channels for communication. And once the song finishes, communication is again undertaken to confirm a shared understanding of the situation. In the example below, pilot M 16 and VTS strive to talk when the song is on, they persevere, and finally conclude the communication once the song finishes. There is an attempt by the VTS to ask pilot M 16 to change channels in line 13. However the song finishes and they are able to communicate.

Example 4.30: Pilot M7, VTS and music

7124. **M 7 –** VTS, pilot M seven
7125. **Song –** *Har taraf shor hai; mein diwana kam nahi hoon* (transliteration) – everyone knows about it; I am no less crazy about you (translation)
7126. **VTS –** M seven, good morning
7127. **Song –** *Dil churaane aa gaya, dil chura le jaunga* (transliteration) – I have come to steal your heart, I will steal it (translation)
7128. **VTS –** M seven, VTS good morning
7129. **P –** VTS, pilot M seven
7130. **Song –** *Ho Jaye* (transliteration) – wish this happens (translation)
7131. **VTS –** M seven, good morning.
7132. **Song –** *Mujhko ikraar ho jaye* (transliteration) – Wish I fall in love (translation)
7133. **P –** VTS, pilot M seven
7134. (1.0) instrumental music
7135. **VTS –** M seven, channel one four, one four
7136. **Song –** *Pyaar ho jaaye; rab kare mujhko bhi pyaar ho jaye. Ho tera dil bhi jaana bekarar ho jaye; tera dil bhi jaana bekarar ho jaye, rab kare tujhko bhi pyaar ho jaye; rab kare tujhko bhi pyar ho jaye*
7137. **VTS –** M seven, VTS good morning
7138. **M7 –** Yeah VTS, good morning *Magnum* boarded zero one two zero, under way zero one two five from dock, going to sea. P A C number one two three four dated twenty three, twelve, ten, for offshore oil exploration
7139. **VTS –** Okay

In example 4.30, the VTS operator and the pilot re-establish identities each time after being interrupted. The practice of dealing with interruptions and persevering to communicate is an accomplishment and an accountable feature of work and is discussed further in chapter 6. The pilot finally goes on to communicate the post pilot boarding information for an outbound vessel, which is a key communicative stage (see chapter 5). The interaction in example 4.30 takes approximately 24 seconds to complete, when usually such interaction takes about 3 seconds when the communication is free from interruptions.

As with abusive language, music is a binary opposition that is integral to the night-time port radio. The absence of music during the daylight hours is marked by its presence at night. Music hinders and interrupts interaction on the port radio at night and can be detrimental to safety. The VTS operators persevere and if necessary change channels to ensure that communication is carried out. The night-time port radio is attractive to fishermen to play their songs as there are periods of silences at night which they attempt to fill with music. Night-time music becomes a part of the VTS operators' life world as they have to work with it and use strategies to overcome its distracting and interrupting nature while facilitating communication on the marine radio. The VTS operators use strategies like repetition and switching channels to facilitate communication. They remain patient and above all demonstrate sheer dogged perseverance to carry on communicating to ensure safe vessel movements in the harbour. The songs are more than an irritant. They are a potential source of risk to critical maritime communications. The songs initiate unsolicited responses and comments from listeners. A listener got bored of hearing one song and said

> *Arrey purana ho gaya. Naya gaana gao* (transliteration)
> It has become old. Sing a new song (translation)

When the singer did not oblige him and continued to sing the same song, he said –

> *Phir vohi gaa raha hai* (transliteration)
> Still singing the same song (translation)

A religious song with its devotional content did not find favour with one listener who felt that a winter night in the Arabian Sea was neither the time nor the place to listen to a hymn/prayer.

> *Abe chhup be. Kaunsa gaana gaa raha hai. Gaandu saala* (transliteration)
> Shut up. Which song are you singing! Ass hole (translation)

In addition to the foul language and songs aired in the harbour, at times the fishermen and/or local seafarers engage in frivolous banter. They communicate in English to parody the manner in which the VTS conducts ship-shore communication. They have fun with the English language and use it to create humour. They laugh at the 'serious' sounding communication aired from the VTS office and have fun at the VTS' expense. This is in line with the findings of Kachru (2006), wherein he examines mixing English in Hindi popular songs. He argues that the *'motivation for mixing English and Hindi popular songs is to have fun with the language, i.e. to create humour and parody'*. He finds that *'English is used at par with other Indian* *languages'* and that testifies *'to its status as totally and completely nativized in the Indian context'*.

Example 4.31: Two speakers parodying VTS
Question – What is your vessel name? (Question asked in an affected voice)
Answer – Vessel name is S.H.I.P (In the response the speaker spells out the word 'SHIP' slowly, as if trying to explain something very obvious to a small child)

Example 4.32: Two speakers parodying VTS
Vessel 1 – *Kajal Twenty*. Come in
Vessel 2 – Negative. Negative. Interrogative
Unknown – Ha, ha!

The first speaker in example 4.32 asks the vessel, *Kajal 20*, to come in, affecting the manner of the VTS operator. Speaker two in his response uses important sounding words to parody the institutional ship-shore VHF interaction. The speakers perform camaraderie and impoliteness as part of their work culture (see Goffman 1959; Mullany 2011).

The fishermen and local seafarers are spatially and physically removed, scattered on several vessels in the harbour. They do not have immediate physical access to each other and do not have access to the visual and non-verbal cues at night, regardless, they continue to perform. This study is not about the workplace culture of fishermen or local seafarers on-board small craft in the harbour who mouth profanities and air songs. They are included in my study as they occupy valuable airtime and temporarily disrupt vital port communications, which has consequences for navigation safety in the harbour. An understanding of all the social actors in the port is necessary for a comprehensive picture to emerge of the social actors and contexts which shape ship-shore communications.

Frivolous banter is out of place on the marine radio. However it is a part of the night time soundscape. In the example below, one person was disturbed by the singing and wanted the singer to sing softly. Another commented that he should become a singer and questioned what was he doing on a boat in the harbour and added that the talent show 'Indian Idol' would be aired again and the singer could audition for that. To which the singer responds that he would leave his current line of work in shipping for a career in singing. The banter is harmless, frivolous, light-hearted and a waste of time. The manner of speaking of both speaker 2 and the singer is not serious. Speaker 2 does not genuinely encourage the singer and the singer does not take him seriously. It is as if both are aware of the remote possibility of the singer ever winning the talent contest.

Example 4.33: Singing talent in the harbour
Speaker 1 – *Aavaz kum kar* (transliteration). Sing softly (translation)
Speaker 2 – *Tujhe singer banna chahiye, idhar kya kar raha hai* (transliteration)
You should become a singer. What are you doing here? (translation)
Singer – *Arre kya karun yaar?* (transliteration)
What to do my friend? (translation)
Speaker 2 – *Abhi mauka hai idol 6, 7 aane waala hai* (transliteration).
There is an opportunity now. Idol 6, 7, is about to be aired (translation)
Singer – *Chhod deta hun shipping line ko. Theek hai*. Okay (transliteration)
I will leave the shipping line. All right. Okay (translation)

The profane language, careless banter and songs aired on the marine radio are integral to the harbour. They serve to introduce risk in the safety critical and time critical communications, they serve to irritate the VTS operators who rarely ask the speaker(s) to shut up; they do not contribute towards making it an ideal work environment for the VTS operators and they serve to contextualise the backdrop in which the VTS operators conduct their routine work.

4.9 Conclusion

Chapter four highlighted the complex life word of the members – a harbour abuzz with activity; innumerable craft dotting the seascape; vessels at anchor and on the go – merchant ships, tugs, barges, pilot boats, naval and coast guard vessels; a busy space, and the VHF radio interaction facilitating safe traffic movement in the channel. The chapter discussed the preoccupation with time and tide in port operations. The knowledge of time (eta and etd) and tide are utilised to draw up the day’s traffic schedule by the port office which seeks to maximise the effective and efficient utilisation of the port’s resources. The VTS operators go on air and operationalise and accomplish the traffic schedule interactionally on the VHF radio.

This chapter introduced MahaDevi VTS and the four key communicating groups on the marine radio – the VTS operators, the Dock Master, the harbour pilots and the fishermen/local seafarers. The chapter identified and located the key protagonists in the harbour; the VTS operators monitor traffic and facilitate safe traffic movement from their office on the top floor of a tall building at the edge of the pier; the Dock Master sits a few doors away; the harbour pilots operate in the fairway and the local fishermen and local seafarers are aboard their small craft in the harbour. This chapter has discussed the roles of the key groups in marine radio communication and set the scene for the following chapters (5 and 6) that delve deeper to explore the accomplishment of harbour and channel navigation.

Atkinson et al. (2008) argue that it is not enough to say there is 'complexity' and enumerate the anecdotes, binary oppositions and other aspects of fieldwork data. These aspects need to contribute towards the multi modal meaning making in the research. The functionality of the aspects has to be explored for the meanings to emerge. Taking inspiration from Atkinson et al. (2008), I have conveyed the interrelated, interdependent and interconnected roles of the social actors/members and enumerated the criss-crossing of their paths on the marine radio that enable them to accomplish institutional work. I have shown that the profanities, music and banter are not for entertainment alone, but they impact the interactional practices on the VHF of the VTS operators and pilots in accomplishing institutional interaction (see Sanders (2003) for adapting conversation on VHF). I have also shown that the VHF is not only used by social actors for institutional purposes alone but also for the performance of rank, status, hierarchy and reprimands, which in turn, can be used to accomplish institutional work (discussed further in chapter 7 on micropolitics of port communication). This chapter has attempted to convey the sights and sounds of MahaDevi port and situated the main social actors/members in their essentially multimodal world and bring to the fore, what it means to be a MahaDevi VTS operator (for multimodal from the perspective of physical senses, see Dicks et al. 2006).

The MahaDevi VTS operators, their training and qualifications, the work and its organisation are discussed in detail in this chapter, and together with chapter 1, the first research question – *'What is the work of VTS operators?'* has been answered. The chapter also identifies the lack of continuity between shifts and the lack of technological support for the VTS operators in enabling seamless continuity between shifts. The VTS technology is recovered in this study in line with ethnomethodological studies of work and the technology is made analysable and the findings can support the design of technology supportive of in situ work (Button 1993c; Button 1993a). The VTS operators face difficulties in ascertaining the exact location of ships which are not plying in the main channel and they ask questions of ships to place ships in the area and accomplish traffic monitoring. Placing ships in the physical space is an accomplishment and an accountable feature of VTS work (Garfinkel 2002). The finding of the lack of technological support answers, in part, the final research question - *'What are the challenges, if any in the work of VTS operators?'* Chapter 5 follows, which explores the performance and accomplishment of harbour navigation.

Chapter 5 The Performance and Achievement of Harbour Navigation

> The throng is *orderly*, when all who meet or overtake one another in crowded ways take the time and pains needed to avoid collision and whenever the pursuits of members of orderly communities interfere, they make the adjustments necessary to escape collision and make them according to some conventional rule (Ross 1901, p.1, original emphasis)

Example 5.0: VTS-ship interaction; instructions to arrive at pilot station
4341. **VTS –** *Hong Kong*, *Hong Kong*, MahaDevi VTS
4342. **HK –** MahaDevi VTS, this is *Hong Kong*
4343. 2.0
4344. **VTS –** motor vessel *Hong Kong*, *Hong Kong*, MahaDevi VTS calling, come in
4345. **HK –** this is *Hong Kong*, come in please
→4346. **VTS –** okay *Hong Kong*, you can arrive pilot station one three three zero, thirteen thirty you should be at pilot station, confirm, copy?
4347. **HK –** yes that is, one three three zero, I will arrive pilot station
4348. **VTS –** correct and pilot ladder on starboard side, one metre above water level

The example above (5.0) is one of several VHF calls made daily by the VTS operators to call ships inside the port limits and provide information on pilot boarding arrangements. It is one of the key communicative acts on the VHF radio facilitating harbour navigation (see section 5.4). The above excerpt sets the ethno-methodological (Garfinkel 1967, 2011 edition, 2002, 2006) tone of the chapter that explores and nuances in situ accomplishment of harbour and fairway navigation.

5.1 Introduction

The previous chapter (number 4) introduced MahaDevi port and located the multiple social actors in the harbour – VTS operators, shipboard seafarers, Dock Master, harbour pilots, fishermen and local seafarers. In addition to locating these social actors in the dynamic harbourscapes, the chapter explored their roles in the harbour, institutional talk, some of the accountable features of the work of VTS operators and pilots and some of the key themes in the data along with the chitter-chatter/banter, profanities and live singing on the marine radio. Chapter 4 introduced a complex life world (see Atkinson et al. 2008), where on the one hand, high risk safety critical navigation operations are conducted round-the-clock and on the other, is the cacophonic bedlam of the marine radio. Chapter 4 provided a dynamic background which is shaped by, and simultaneously shapes and constrains the actors/members, while chapters 5 and 6 explore the in situ performance and accomplishment of harbour/fairway navigation.

Chapters 5 and 6 have a similar focus; in both these chapters, naturally occurring interaction on the VHF radio is explored to reveal the in situ fine-grained practices of accomplishing harbour and fairway navigation. These two chapters present institutional talk and members' methods that accomplish safe navigation and in this respect can come across as highlighting a selection of clean/sanitised data. This criticism is countered by the structure of the thesis – chapters 5 and 6 are designed to reveal the method in the madness while chapters 4 and 7 capture the pulse of the harbour; the messy chaos not addressed in chapters 5 and 6. Together the four empirical chapters offer an in-depth exploration of the work of MahaDevi VTS operators in the harbour in line with ethnomethodological workplace studies.

The first research question – What is the work of VTS operators? (see chapters 1 and 2) has been answered by the literature review (chapter 2) as well as in chapter 4 with respect to the MahaDevi VTS. Chapters 5 and 6 delve deeper to answer the remaining research questions of the study focussing on how the work is accomplished in situ by the participants. The following research questions are answered in chapters 5 and 6.

- How do they work?
    - How is vessel traffic managed?
        - What are the practices, procedures and activities that facilitate vessel traffic management?
    - How is harbour / channel navigation achieved interactionally?
        - What is said, when, to whom, why, how and to what effect in furtherance of the communicative management of harbour/channel navigation?

Despite having a similar focus, chapters 5 and 6 are differentiated by the content they cover. Chapter 5 exclusively focuses on the communicative management of MahaDevi port vessels, while chapter 6 explores the communicative management of traffic between two neighbouring port VTSs. Chapter 5 is lengthy as it covers 4 vessel trajectories of MahaDevi port vessels out of 6 main trajectories identified in the harbour and Chapter 6 covers the remaining 2 trajectories as they pertain to the neighbouring Sagar port (see figure 5.2, page 151). To balance out the material presented in both chapters, a decision is taken with respect to the presentation of the two chapters. Exploration of vessel trajectories to reveal institutional practices and communicative management is common to both chapters (5 and 6), therefore, to avoid redundancy, a brief summary is given at the end of chapter 5, while detailed conclusions are presented at the end of chapter 6 drawing upon the common findings of both the chapters. In addition to the communicative management of the traffic between two neighbouring ports, chapter 6 also presents findings in the research which were not covered in the exploration of vessel trajectories. The rationale of exploring the accomplishment of marine traffic management from the view of vessel trajectories is elaborated in section 5.4.1.

Ships do not simply happen to miss each other in a narrow channel. Safe navigation and collision avoidance is actively achieved by the members – shore based VTS and shipboard bridge teams. This study inspired by ethnomethodological workplace studies; it explores ship-shore VHF radio communication, and studies the situated accomplishment of institutional work with respect to the VTS. There is high density of traffic in the harbour with numerous ships at anchor and several ships on the go at any given time in the channel. There are practical challenges in getting a ship safely through[91] and chapter 5 explores the artful accomplishment safe harbour and channel navigation for MahaDevi vessels (see Garfinkel 1967, 2011 edition, 2002, 2006).

The operators providing VTS services in the harbour are clerks inhabiting a complex social world. They face technical, social and organisational challenges in the provision of VTS services and their work can be seen as a continuous attempt at risk mitigation. There are limits to the technology available to the VTS operators; there are competing voices in the harbour vying for a share of the airwaves; there are people talking over the VTS, talking at the VTS and talking to each other; at times the air waves are engaged for other purposes (delegating ancillary work, conducting internal communication, personal communication, recreation etc.). Office politics colour the interaction and the rank and status of the VTS operators bleed through from the wider societal and occupational culture to the VHF radio[92]. Chapter 5 draws upon literature on ethnomethodological workplace studies (Heath and Luff 1992; Button 1993c; Harper and Hughes 1993b; Heath et al. 2000; Heath and Luff 2000d; Heath et al. 2002; Rawls 2008) ethnography of communication (Saville-Troike 1982; Gumperz and Hymes 1986; Moerman 1988 (1996 edition)), interactionism (Cooley 1902 (revised edition 1922); Mead

[91] This thesis does not address the navigational challenges faced by the seafarers on-board the ship domain.
[92] The micro politics of port communication is explored in chapter 7.

1934; Blumer 1969; Atkinson and Housley 2003), ethnomethodologically informed conversation analysis (Wowk 1989; Boden and Zimmerman 1991, 2003 edition; Ten-Have and Psathas 1995; Hester and Eglin 1997; Nevile 2004) and Goffman (1959; Goffman and McGinnis 1961; 1963, 1967, 1971, 2010 edition, 1974, 1981; Drew and Wootton 1988 (2003 edition)), Garfinkel (1967, 2011 edition, 2002, 2006) and Sacks (1992) to explore the performance and interactional achievement of channel navigation.

Maritime accidents (in the VTS area and elsewhere) cause irreparable damage to life, property and the environment. The focus of this chapter is not a post-accident analysis, but the embedded, routine in situ performance and achievement of harbour navigation by the VTS operators that contributes to an enhanced understanding of how harbour navigation is locally undertaken on a daily basis. In this respect, this chapter is similar to Nevile's (2004) study of the accomplishment of routine flights, as it studies naturally occurring routine data (see Sacks 1992; Silverman 2006b) with a focus on the situated routine performative achievement rather than analysing accident investigation reports or 'non-routine' data.

Harbour navigation is not a lucky accident; it is an orchestrated performance and accomplishment, for which I first turn to dramaturgy (see Goffman 1959). I draw a parallel between the theatre stage and the channel/fairway. I regard the channel as the centre stage of the performance, and the related activities that go into achieving harbour navigation, as constitutive of a production.

5.2 A Performance in the VTS Office and the Harbour

The VTS office can be likened to dramaturgical stage (Goffman 1959; Burke 1984) – an institutional theatrical space from where live on air radio broadcast performances are given throughout the day. Marine VHF radio communication has an inherent duality built into it. The VHF radio communication is a front stage performance which originates from an out of sight, unseen backstage of the VTS office. The talk-in-interaction on the port VHF radio is a front stage performance as it is broadcast on air for the benefit of all the attuned listeners on the port radio and backstage in the sense that the VTS operators are far removed from their listeners in their office on the top floor of a tall building at the end of the pier. The VTS operators are performers of institutional talk-in-interaction, for the duration of their duty. They perform and accomplish 'doing VTS' through talk on the radio. The VTS operators attempt to give the impression of being knowledgeable, updated and informed about the latest traffic developments and vessel movement schedule for the day (see Goffman 1959). In some cases they do not appear on top of things; this might be because of the technological constraints/challenges, not being informed by the Control Station of new updates or because the Dock Master or senior pilots choose to steal their thunder etc.. The theme of technological constraints has been discussed in chapter 4 (section 4.4.1). The role of the Dock Master and Harbour Control Station in VTS operations have also been explored in chapter 4 and the transgressions of the Dock Master and the pilots on VHF will be explored in detail in chapter 7 on the Micro Politics of Port Communication.

Dramaturgy can be applied to the MahaDevi harbour. Every day in the port, a performance takes place to accomplish navigation in the channel. Various port departments – the VTS office, the Dock Master's office, Harbour Control, Harbour Master's office, pilots and seafarers participate in making navigation possible. Various actors/protagonists will go on air on the radio and take part in this live ongoing performance. The channel can be considered as the stage and the ships waiting at outer anchorage, waiting for a chance to enter port limits, as actors waiting in the wings. Each protagonist can claim airtime and go on air to interactionally negotiate channel navigation. Not all of the dialogue is scripted in the talk-in-interaction. The talk ranges from the standardised tight dialogue to loose (see Goffman 1963) and protagonists also find time and space for adding personal touches into VHF calls like, *'I would like to overtake you, If you don't mind'* (see footing of Goffman 1981). The VTS operators perform channel navigation with other actors. They support navigation and at times when the airwaves are at their busiest, they communicate their safety and time critical messages through sheer dogged perseverance.

A play on the theatre stage has its entrances and exits. Actors enter, move about or exit on cues. Similarly ships require permission – cues to enter and move in the channel. Ships are clearly told not to enter the channel when the VTS, Control Station, Dock Master, pilot launches and pilots are not ready for them or not expecting them. After a ship is told to enter, it is monitored in its progress up the channel and is expected to communicate with the VTS at reporting waypoints. The VTS and ships also communicate at key communicative stages of a ship's journey in the channel (see section 5.4.2). The VTS operators communicate to move the ship from the anchorage to the pilot station and from the pilot station to the berth or inner anchorage as the case may be. In the examples below, ships are categorically told by the VTS operators to wait outside and not to enter the port limits. These ships are actors in the wings whose time for entering and performing on the channel stage has not arrived, yet.

Example 5.1: VTS to ship; '*not to come inside'*

1634. **L 105 –** MahaDevi VTS, MahaDevi VTS, *Liberty one zero five*
1634. **Unknown –** *Swyber one one, Swyber one one,* come in
→1635. **VTS –** *Liberty,* please wait outside till we call you in, not to come inside
1636. **L 105 –** Roger not coming in sir, I have anchored at [omitted] outer anchorage, over
1637. **VTS –** okay

Example 5.2: VTS to ship; '*wait outside'*

289. **Antjee –** MahaDevi VTS, MahaDevi VTS, *Antjee*
290. **VTS –** *Antjee*, VTS
291. **Antjee –** Sir good afternoon sir, any instruction for us?
→292. **VTS –** so *Antjee*, wait outside the port limit, we will let you know
→293. **Antjee –** yeah okay sir we'll wait outside the port limit, okay

Dramaturgical insights in this study are not limited to considering the navigation channel as the theatrical centre stage of the performance. The key social actors in the scene and the dynamic background of the harbourscapes has previously been explored in chapter 4 and the study draws upon 'vocabularies of motive' (Mills 1940; Burke 1984) 'role', 'embarrassment', 'remedial work', 'frame analysis', 'intention display' 'footing' and 'interaction order' to nuance the research findings (Goffman 1971, 2010 edition, 1974 (1986 edition); Drew and Wootton 1988).

The VTS operators call ships scheduled for arrival, departure and for internal movement within the port, depending upon the movement schedule received from the office. The number of ships moving in the channel is limited by calling inside, only the designated ships according to their scheduled time. Time and tide precede all other considerations in the harbour as they shape the port operations and the provision of VTS services. Section 4.3 in chapter 4 has explored how time and tide shape, support and constrain port operations. Before exploring the communicative management and interactional accomplishment of harbour navigation – the main vessel trajectories, key communicative stages, together with the achievement of associated activities, I turn to aspects of talk on the marine radio and utilise concepts from conversation analysis to nuance the same.

5.3 Key Aspects of Talk on the VHF Radio

It has been highlighted in the methods chapter (number 3) that this study is not envisioned in the conversation analysis (CA) tradition. However, I draw upon concepts from CA to nuance and highlight key aspects of talk on the marine radio, and where necessary, transcribe select extracts in the CA tradition. I draw upon the works of Harvey Sacks (1989, 1992), Gail Jefferson, Emanuel A. Schegloff (2007) and George Psathas (1990a, 1995a) to render visible the key features of port institutional talk.

As highlighted previously, the VHF radio technology uses a single channel to both transmit and receive information. The mode of operation of the VHF radio is half-duplex in nature: that is a person can either talk or listen but cannot do both simultaneously as one can do on the telephone. Only one person can talk at a time by pressing a 'push to talk' button. The nature of the VHF technology shapes and constrains the interaction on the radio and explains why overlapping talk is conspicuous by its absence.

The interaction on the port radio is largely institutional talk[93] (Drew 1985; Drew and Heritage 1992; Drew and Sorjonen 1997) that accomplishes harbour navigation. A unique feature of the interaction on VHF radio is that caller speaks first, unlike the telephone in which the answerer speaks first. The 'summons' utterance does not follow the IMO, SMCP (2002) prescriptive guidelines which will explored in section 6.4.3 on rule following. Gauged from the transcripts of audio recordings, the format of the 'calling/summoning' utterance is the name of the addressed followed by the addressee. The format of the response is the name of the caller from the summons utterance, followed by name of the responder. Stripped of particles and personal pronouns, the summons is dense and truncated. The summons are nevertheless intelligible and the vessel need not say, 'this is X calling' (see Froholdt 2011).

Example 5.3: VHF summons
262. **SM –**V↑<u>T</u>S, V↑<u>T</u>S, *Sea ↓Merma:id*
263. **VTS –** ↑*Sea Merma:id*, ↓VTS

Example 5.4: VHF summons
10. **M31 –**Mahadevi Port ↑<u>Control</u>, ↓*Mi:ke 31*
11. **VTS –** ↑*Mi:ke 31*, ↓VTS

A telephone has a ring that can be hearably heard for the responder (Garfinkel 2002), while the

[93] Barring the instances when the port radio is engaged for airing music, unique mobile phone ring tones, profanities, chitter chatter, personal talk and banter (usually late in the night).

VHF radio does not have an accompanying ring. The VHF utterance is a radio broadcast accessible to all attuned listeners. The format of the VHF 'summons' (examples 5.3 and 5.4 above) is suited to select and call one particular entity from the several bystanders, as the summons uniquely pre-selects (identifies and names) the participant to follow in the interaction. I was struck by the sing-song lyrical quality of the summons with rising and falling intonation (examples 5.3 and 5.4 above) which is similar to the finding of Froholdt (2011) who states that the emphasis, the prolongation of sounds and the rise and fall in intonation in *VHF calling make it a unique kind of 'hailing'* which has a *'distinct prosody'*, a *'calling outness feature'* to which the uniquely identified responder orients and responds. The following field note illustrates my reflective engagement with the special kind of calling on VHF.

> To get the attention of an individual in a crowded room, one option could be to get atop a table and talk loudly to get everyone's attention first and thereafter the attention of the required individual. This option is not available on the port radio as the speakers are not co-located. Even though the air waves are crowded, the callers on the VHF radio do not shout while calling each other and yet manage to cut through the clutter, get the required attention and the response from the required entity most of the time. This unique (sing-song) method of calling is oriented towards cutting through the clutter and even though the caller's name might be missed in some instances, the responder makes it hearable and asks the caller to call again (field note, data reflection, 28 Feb 2010).

In the speech exchange system of the port VHF radio, a caller presses a button to go on air and in doing so, nominates self to take the floor and owns the speech rights. In the summoning utterance the caller identifies the respondent for the next turn. Thus the first turn is self-allocated and the next turn is allocated by the caller. The main adjacency pairs featuring on the port radio are 'summons-response' and 'question-answer' (Sacks 1989; Schegloff 2007). The VHF radio interaction is between two parties at a time and the conversation sequence followed on the port radio is 'AB re-duplicated', where a suitable response to an 'adequate complete utterance', completes the paired characteristic of the adjacency pair (Sacks 1989, p.352). In this institutional setting, by virtue of their role, the VTS operators have the authority to ask questions until the questioning is over, in which case we find extended question-answer sequences. This is particularly visible in the Extended Initial Contact the VTS has with ships (see section 5.4.2.i), in which it obtains pertinent information from the ship in the key communicative stage of the vessel trajectory. The following section explores the communicative management of ships in the harbour.

5.4 The Communicative Management and Accomplishment of Harbour Navigation

This section explores how harbour navigation is interactionally achieved on the VHF radio, in situ, by the VTS operators, shipboard seafarers and harbour pilots. Dense harbour traffic, VHF radio traffic, organisational procedures/practices, communicative management and interactional accomplishment are taken as social facts in this study. The exhibition of mutually oriented coherent orderliness by the social actors (VTS operators, seafarers and pilots) is explored and unpacked in this section to describe the mutually *'intelligible empirical phenomenon of immortal ordinarily society'* (Garfinkel 2002, p.68). Order does not leave the navigation channel once the ships (currently transiting it) leave it. Order is continuously constructed and reconstructed by the 'local population cohorts' (Garfinkel 2002) that populate the scene. Ships are always waiting to use the channel to journey to their destinations and pilots and VTS operators change with every shift but order producing activities endure. This section explores the enduring mutually intelligible, order producing interactional practices that facilitate and accomplish movement of traffic in the harbour and channel. The knowledge of the route of a vessel and its trajectory is a prerequisite to exploring the interactional achievement of harbour navigation.

5.4.1 Key Vessel Trajectories

The harbour is used by several entities – fishermen, shipboard seafarers, dredgers, harbour pilots, MahaDevi and Sagar port vessels, the Indian coastguard, the Indian Navy and more. Tens of thousands of vessels use the harbour each year and there are as many trajectories as vessels in the harbour. However, upon grouping them according to the port they are calling at and the function performed in the harbour, six main vessel trajectories are discerned (figures 5.1, 5.2 and 5.3, page 151). A vessel trajectory is the route of the ship as well as its physical movement in the channel to arrive or depart the port facility. Key communicative stages occur at different stages in the trajectory and have related activities that need to be negotiated and interactionally accomplished for safe and continuous traffic movement. Figure 5.4 is a map of the harbour that depicts the space negotiated by the vessels in their voyage to MahaDevi and Sagar port respectively and VHF radio communication with the VTS is an essential part of the ship-port interface. Vessels communicate their way in and out of the port all the time and the recording the interaction captures the audio footprint of the vessel's journey in the harbour. The following field note illustrates my reflexive engagement with the data and the decision to explore the institutional management, procedures and communicative practices that accomplish harbour/channel navigation with the vessel trajectories as a reference point.

> As I listened to the audio recordings, hour upon hour, and as I transcribed along, I realised that the VTS operators were saying similar things to vessels at similar stages in their journey in the harbour. For example, they would give similar instructions to ships to call them inside the port limits, for anchoring, preparation for pilot boarding, departure, etc. Even though each vessel could have a unique experience of the port visit, order lay in the enduring order producing communication of VTS operators on the radio. The operators spoke to the vessels in relation to the stage of the vessel's voyage in the channel and its physical location, implying that the VTS operators only conveyed information to the vessels that was relevant at the time. The exercise, for me, was then to develop a typology of the VTS-Vessel/ seafarer interaction in the harbour to explore order. After going through the transcripts, I identified 6 main trajectories in the harbour (inbound/outbound MahaDevi port vessels, inbound/outbound Sagar port vessels and the rotational movement of dredgers in the channel) along with the key communicative stages. I decided to study order in the harbour from the reference point of the vessel trajectories as they are exemplars of the route taken by hundreds of thousands of vessels that call at the port each year. Vessel trajectories are indexical of the vessel's channel voyage and depict its interactional engagement with the VTS. Vessel trajectory is useful for empirical research focus as it encompasses the whole voyage of the vessel including the designated reporting points, key communicative stages as well as the interaction the vessel engages in, with traffic in the vicinity. The bulk of the traffic in the port is represented by the 6 main trajectories and their exploration helps reveal the ordered movement of traffic in the harbour/fairway. It is for these reasons, I argue, that it is useful to learn about the communicative management of the different vessel trajectories and the in situ accomplishment of institutional work to explore order in the harbour (field note, data reflection, 13 Aug 2011).

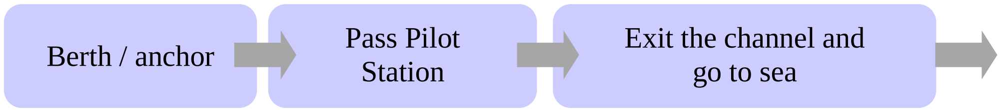
I was not told of officially designated reporting points by VTSOs and they were not mentioned on the port website (www.xxpt.gov.in)[94] in Dec 2010 at the time of my fieldwork. Referring to when inbound ships call the VTS, I was told *"Voh bahar pahunch ke hame call karte hai"* (transliteration), *"They call us upon reaching outside"* (translation) (discussion with VTSO 5). The identification of vessel trajectories and key communicative stages was empirical and data driven. They were identified as patterns emerged from information exchanged on the VHF. Figures 5.1, 5.2 and 5.3, depicting the key vessel trajectories are given on the following page.

[94] Withheld to preserve anonymity. Navigation guidelines for the port mentioning the VTS first appeared online in 2011, a year after my fieldwork and the VTS manual in 2013, nearly two and a half years later.

Figure 5. 1: Trajectories of inbound and outbound MahaDevi port vessels

1. ***Inbound MahaDevi Vessel*** – from High Seas/Outer Anchorage to Berth/ Inner Anchorage

2. ***Outbound MahaDevi Vessel*** – from Berth/inner Anchorage to Sea

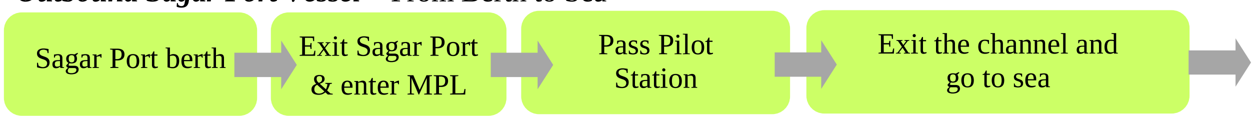


Source: Student

Figure 5. 2: Trajectories of inbound and outbound Sagar port vessels

1. ***Inbound Sagar Port Vessel*** – from High Seas/Outer Anchorage to Sagar Port Berth

2. ***Outbound Sagar Port Vessel*** – From Berth to Sea



Source: Student

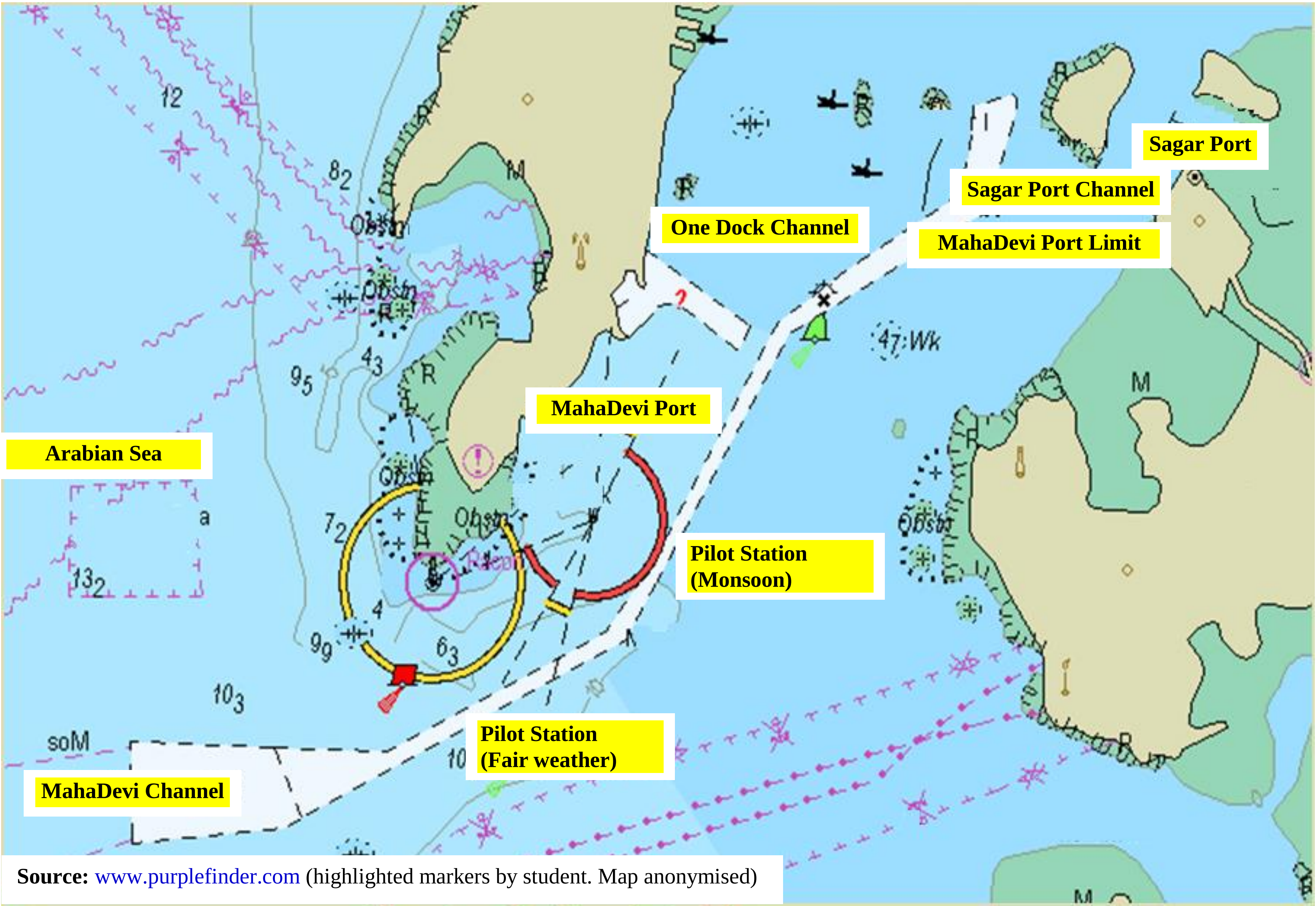
Figure 5. 3: Trajectories of outbound and inbound dredgers in the channel

1. ***Outbound Dredger*** – From Dredging Area to Dumping Ground Outside Port Limits

2. ***Inbound Dredger*** – From Dumping Ground to Dredging Area Inside Port Limits

Source: Student

Figure 5. 4: MahaDevi port



Source: www.purplefinder.com (highlighted markers by student. Map anonymised)

5.4.2 The Communicative Management of MahaDevi Port Vessels and the Accomplishment of Safe Navigation

This section explores the accomplishment of institutional work by the VTS operators, seafarers and pilots and the communicative management of vessels calling at MahaDevi port, both inbound and outbound, and the local dredgers that regularly move in the channel. The communicative management of vessels in the port waters is explored by following individual vehicular units (see Goffman 1971, 2010 edition) (also see field note on page 150) as they interact with the VTS and other participants to negotiate and navigate their way in the channel.

5.4.2.i Inbound MahaDevi Port Vessels

The trajectory of a typical inbound MahaDevi port vessel follows the route from the high seas/outer anchorage, past the pilot station to the ship's berth/inner anchorage inside the port (see figure 5.1, page 151). The key stages of communication during the vessel's inbound journey are the initial contact outside the port limits, upon entering the channel/passing the reporting line, at the pilot boarding grounds and after berthing/anchoring. Ships communicate with the VTS in addition to communicating at key stages and the narrative of a vessel's journey in the channel is larger than the communication undertaken solely at the key communicative stages in the vessel's trajectory. Key communicative stages are to be differentiated from reporting points (or way points) (IALA-AISM 2008). Reporting points are usually linked to geographic positions en route where a vessel needs to call and report to facilitate monitoring, while key communicative stages include the geographical reporting points but also encompass important stages in a vessels journey including the negotiation of related activities (for example, achieving pilot boarding) that facilitate the accomplishment of the communicative management of traffic in the harbour. The vessel trajectories and key communicative stages were identified from the transcripts of the audio recordings of the interaction on the VHF.

Depending upon the day's schedule, the VTS operators call the ships in good time; this implies that the ETA provided to ships, includes the notice the vessel requires to get ready, and the time taken to reach the pilot station. Incorporation of adequate time in the ETA is a members' method to efficiently utilise port resources and achieve safe and efficient traffic movement in the channel. Calling the vessel to enter the port limits is an accomplishment that implies the confirmed provision of pilotage and berth allocation for the ship and is an accountable feature of work. If a vessel is coming directly from the sea and a berth has been assigned, it is called in straight away. However, if a berth is not available and no instructions have been received by the VTS from the Harbour Master's Office, then the vessel is instructed to drop anchor in the outer anchorage and await further instructions. Instructing a vessel to drop anchor in the outer anchorage is utilised to control the amount of marine traffic entering the channel.

> "If the berth is available, we call the vessel otherwise we send to anchorage" (interview with VTSO 6).

Vessels first make contact with the MahaDevi VTS from the high seas or anchorage outside the port limits. The Initial Contact between the vessel and the VTS is extremely important as this first contact commences the participation of the vessel in the port VTS system and the VTS is alerted to the presence of a vessel waiting for instructions outside the port limits. The initial contact between the vessel and the VTS is largely structured by the information required to fill in the logs which the VTS operators update by hand. The columns of the logs specify the different information required. In order to obtain the required information from the ships in the initial contact, a question is framed and asked for each of the column headings. The questions posed by the VTS to the ships in the initial contact are brief, standard and predictable. The information required of ships at this juncture lends itself to framing simple questions that closely mirror the Standard Marine Communication Phrases (IMO 2002b). A set of standard questions are asked from the vessels being called to the pilot station like vessel's name, call sign, eta, draft, cargo on board, last port of call, gross tonnage, flag, crew composition etc. It is at this juncture that the VTS makes use of the SMCP especially the *"Phrases for acquiring and providing data for a traffic image" – "acquiring and providing routine traffic data"* (AI/6.1 of SMCP, IMO 2002b). The SMCP are brief, simple phrases stripped of grammar to promote communication in the global multilingual shipping industry (IMO 2002b; see Sampson and Zhao 2003). The MahaDevi VTS operators are trained in procedures of radio telephony but not in Maritime English. On SMCP, I argue that there are not many different ways to ask a small question and therefore the questions posed by the MahaDevi VTS to ships during the initial contact mirror the SMCP closely, despite them not being trained in it. To explore the communicative management of inbound MahaDevi port vessels, I follow two vessels – *Global Atlas*, that had no booking and had to wait outside in the anchorage and *Hong Kong*, which had a confirmed berth and was called in right away[95].

[95] The two examples are chosen to explore the differences in members' methods and the procedures in the communicative management of ships which have pre-booked berths and those that do not. The identification

Inbound *Global Atlas* –

Example 5.5: Inbound, *Global Atlas*, Extended Initial Contact (no pre-booked berth); Key Communicative Act

2046. **3EEY3 –** three, Echo, Echo, Yankee three, over
2047. **Unknown vessel 1 –** *Neelam two*
2048. **VTS –** who is calling VTS?
2049. **Unknown vessel 2 –** come in
2050. **Blue Orion –** *Shakti*, *Orion* one one, one one
2051. **GA –** VTS, this is *Global Atlas*, three Echo, Echo, Yankee three, how do you read?
2052. **VTS –** three Echo, Echo, Yankee three. ↑What is your vessel name?
2053. **GA –** ↑VTS
2054. **Raja Shakti –** *Raja Shakti*
2055. **GA –** *Global Atlas*
2056. **Blue Orion –** channel one one
2057. **Unknown vessel 1 –** *Neelam two eight*
2058. **VTS –** you are cutting off, cutting off, repeat your vessel name
2059. **Raja Shakti –** *Blue Orion* , *Raja Shakti*
2060. **Blue Orion –** *Shakti* channel one one karte hain (transliteration) (translation – let us change the channel to one one)
2061. **GA –** ↑VTS, this is ↑Global
2062. **Blue Orion –** channel one one
2063. **Raja Shakti –** one one
2064. **VTS –** Who is calling channel one one? Go to some other channel. Do not disturb this channel
2065. **Blue Orion –** channel one one karte hain (translation – let us change the channel to one one)
2066. **VTS –** Who is ↑speaking? ↑Who is on the line?
2067. (interruption & disturbance)
2068. **VTS –** ↑Do not disturb on this channel
2069. **VTS –** station calling VTS you are cutting off, cutting off, repeat your vessel name
2070. **GA –** *Global Atlas*
2071. **VTS –** *Global Atlas*, VTS, go-ahead
2072. **GA –** good afternoon, I am going to MahaDevi pilot station, over
2073. **VTS –** can you spell out your vessel name? Spell out your vessel name
2074. 3.0
2075. **VTS –** *Global Atlas* (.) spell out your vessel name
2076. **GA –** Lima, Oscar, Bravo, Alpha, Lima the second name Alpha, Tango, Lima, Alpha, Sierra (.) *Global Atlas*, over
2077. **VTS –** *Global Atlas*, your destination port is MahaDevi, correct?
2078. 3.0
2079. **VTS –** *Global Atlas*, what is your destination port?
2080. **GA –** Destination port is ↑ MahaDevi (.) ↑ MahaDevi, over
2081. **VTS –** what is your eta pilot station? Eta pilot station?

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of the key stages of communication and the in-depth analysis of the communicative patterns encompass the entire data corpus and are not limited to these two vessels alone.

2082. **GA –** my eta pilot station is one six two zero, repeat one six two zero, over
2083. **VTS –** one six two zero, what is maximum draft, maximum draft?
2084. **GA –** maximum draft eight point seven five metre, even keel condition, over
2085. **VTS –** what is your gross tonnage? ↑GRT, gross tonnage
2086. **GA –** gross tonnage is seven three four five, over
2087. **VTS –** last port of call, what is your last port of call?
2088. **GA –** last port is (1.0) Singapore, Singapore, over
2089. **VTS –** what is your flag, flag?
2090. 3.0
2091. **VTS –** what is your nationality? Flag? Nationality?
2092. **GA –** flag nationality is ↑Panama, ↑Panama, over
2093. **VTS –** what is your crew nationality? Crew nationality?
2094. **GA –** crew nationality (1.0) Myanmar is fifteen person and (.) other two-person Korean
2095. **M17 –** M fifteen, seventeen
2096. **GA –** including master, over
2097. **VTS –** *Global Atlas* you're distorted, distorted, repeat your crew nationality
2098. **GA –** fifteen person is (.) ↑Myanmar and two-persons of South Korea total seventeen crew on board including Master, over
2099. **VTS –** what is your cargo, cargo?
2100. 5.0
2101. **VTS –** *Global Atlas* what is your cargo?
2102. **GA –** cargo is (.) Ivory (.) palm (.) oil (.) Ivory palm oil product, over
2103. **VTS –** Palm oil, palm oil, correct.
2104. 3.0
2105. **VTS –** What's the type of vessel, ↑type of vessel?
2106. **GA –** ↑chemical tanker, ↑chemical tanker, ↑over
2107. **VTS –** your cargo is chemical, chemical, correct?
2108. **GA –** cargo is ↑palm oil ↑palm oil product (.) cooking oil
2109. **M17 –** M fifteen, M fifteen, seventeen
2110. **VTS –** okay, palm oil, okay copied just stand by, just stand by
2111. **M17 –** pilot M fifteen, fifteen, seventeen
2112. **GA –** stand by one five

Vessels primarily use their call sign in the summons utterance when they are calling the VTS and not otherwise. On hearing the call sign of a vessel (opening line (2046) of example 5.5), the VTS operator self identifies as the respondent and makes the calling entity accountable to identify itself and move the VHF call ahead. Meanwhile, an unknown vessel is trying to call *Neelam 2* and *Blue Orion* wants a vessel called *Raja Shakti* to switch channels to channel 11. *Global Atlas* identifies itself as the caller (line 2051) in an attempt to engage the VTS in a VHF radio conversation. The airwaves are very busy during this crucial initial communicative stage. Parallel conversations are being initiated by other vessels. Given the restrictive linear nature of the VHF technology, snatches of utterances from different conversations are heard on the VHF radio for each participant to sift and take what is meant for them and move forward. The VTS operator attempts to get the name of the vessel thrice (lines 2048, 2052 & 2058) before reprimanding a caller (*Raja Shakti*) for interrupting and causing disturbance on the port working channel. Reprimands (2064, 2066 & 2068) are utilised to by the VTS operators to sanction perceived territorial offences (Goffman 1971, 2010 edition), reclaim the speech rights and the floor. The air waves of the port radio are not a geographically bound territory, however, the VTS operators have a lion's share of the air waves by virtue of their role in the port therefore continuous interruptions can be regarded as transgressions and accordingly sanctioned. Reprimands are further explored in chapter 7 which explores the rank, status and hierarchy in the port. Reprimands enable the VTS operators to perform anger and irritation at entities who they believe are causing a hindrance in their work. Upon regaining the floor (line 2069), the VTS operator asks the caller for its name for the fourth time and thereafter communication is established between *Global Atlas* and the VTS and the conversation moves forward[96]. The radio alphabet is utilised to phonetically spell out words for clarity and accordingly the VTS operator asks *Global Atlas* to spell out its name (line 2073) and *Global Atlas* did not respond for three seconds. The VTS operator again asked the vessel to spell out its name (line 2075). In the same vein when the VTS operator asked the vessel to confirm that it destination port was MahaDevi (line 2077), and when *Global Atlas* did not respond, the VTS operator repeated the question. On the busy MahaDevi VHF channel, entities that are engaged in conversation, usually take between one and two seconds to respond. Each time there is a gap of two or more seconds, the silence is made hearable and the respondent held accountable to come on air and respond (lines 2075, 2079, 2091 & 2101). The VTS operator goes on to ask several key pieces of information from the vessel in the initial contact – eta, draft, gross tonnage, last port of call, flag, crew nationality, cargo and the type of vessel *Global Atlas* is, before asking it to stand by. The VTS operators follow prescriptive guidelines (IMO 2002b) and ask for one piece of information per turn to prevent misunderstandings and confusion that could pose a safety risk (Morrow et al. 1994). In this key stage, the VTS requires information in bite sized chunks which can be contrasted with the highly dense, VTS pilot communications discussed later in the section.

Several members' methods can be utilised within each key communicative stage; self-selection

[96] Conversation without interruption is marked by a curly brace.

as the respondent by the VTSO upon hearing a vessel's call sign, reprimands, dealing with interruptions, individually enunciating numbers, using the phonetic alphabet, speaking slowly, speaking loudly, using the word, 'correct' and 'copy' for confirmation are the methods employed by VTS operator in example 5.5 to accomplish institutional interaction and these methods are discussed in section 6.4.2 on communicative strategies to increase the uptake of the message.

The key communicative stage of the Extended Initial Contact outside the port limits is the longest ship-shore VHF interaction that usually takes about 2 & 1/2 minutes of airtime. In the example above, the conversation between the VTS and *Global Atlas* from start to finish took 4 minutes and 10 seconds. The sheer length of the initial contact interaction makes it prone to interruptions on the busy VHF channel. Pilot M17 tried to call his colleague, M15, three times (lines 2095, 2109 & 2111) and each time he was ignored and the VTS operator and Global Atlas kept talking unmindful of his brief utterances. Handling interruptions is further discussed in section 6.4.2 on communicative strategies.

The 'confirmatory form' of talk, identified by Bailey et al., (2006) can be seen in example 5.5. The researchers identified the 'confirmatory form' of talk between co-present members of the ship's bridge team in which the received instruction was repeated and confirmed to ensure a shared perspective in the bridge team engaged in navigation. Froholdt (2011) explored the 'confirmatory form' in maritime interaction between spatially distributed speakers. She builds upon the study by Bailey et al., (2006) and states that the 'confirmatory form' is the practical realisation of an institutional 'pre-script' (prescribed talk) of the 'read back'.

Example 5.6: Confirmatory Talk
112 Cpt one three zero please=
113 Helm =one three zero
114 Helm one three zero
115 Cpt Thank you
Source Bailey et al. (2006, p.346)

The 'confirmatory form of talk' (Bailey et al. 2006) features in example 5.5 (lines 2083, 2103, 2110) and my finding is similar to Froholdt (2011) where the 'read back' provides an opportunity for correction and can appear as a reformulation. Example 5.5 shows that strict adherence to prescriptive rule following is largely done away with in practice on a busy radio channel for the sake of economy. Reformulated rules and local practices emerge. *Global Atlas* used the word 'over' to signal the end of most utterances while the VTS operator does not use 'over' at all. The IMO SMCP (2002) prescriptive rule of using 'over' to mark the end of each radio utterance is compared with the inconsistent to non-existent use in real-life practice in section 6.4.3 on rule following. Other prescriptive rules not followed by *Global* Atlas and VTS are identification with each turn of the VHF radio conversation and taking the name of the addressee three times in the summoning utterance. According to the IMO SMCP (2002) rule, the summons utterance should look like example 5.7 below, but that is rarely the case in reality.

Example 5.7: IMO SMCP; prescriptive summons utterance
GA – VTS, VTS, VTS, *Global Atlas*

The confirmatory form of talk in VTS interaction, its reformulation, utilising it to confirm and/or invite correction are methods utilised by the VTS operator to accomplish ship-shore VHF interaction. Contingent rule following with respect to the SMCP in the use of 'over', non-identification with each turn at talk and the structure of the summons utterances are methods utilised by the members for reducing air time in the interest of economy. Contingent rule following is discussed further in chapter 6.

Global Atlas had been asked to stand by, in example 5.5 and after one hour the vessel calls the VTS to know the pilot boarding time. Since no instructions have been received by the VTS, *Global Atlas* is told that it needs to drop anchor in the designated North Anchorage and call the VTS after anchoring. The key communicative act of instructing the vessel to proceed to anchor in the designated anchorage helps manage congestion near the port approach. With respect to the instructions pertaining to anchoring, the VTS operators usually speak brief, standard, three part sentences with the location (name of anchorage), action/instruction to drop anchor and the final instruction to inform the VTS.

Example 5.8: Inbound *Global Atlas*, Proceed to Anchorage, No Berthing Instructions; Key Communicative Act

2603. **GA –** MahaDevi VTMS, MahaDevi VTMS, this is motor tanker *Global Atlas*, three Echo Echo Yankee three calling, over
2604. **NAM 123 –** *Lucy two, NAM one two three*
2605. **VTS –** *Global Atlas, Global Atlas*, VTS, go-ahead
2606. **GA –** May I know pilot schedule, pilot boarding time sir
→ 2607. **VTS –** Global Atlas, there is no instruction for you now, you go to North anchorage that is [omitted] anchorage, drop anchor, inform VTS
2608. **GA –** Roger, copy that I proceed to [omitted] anchorage and drop anchor at the (incomprehensible), thank you sir

The language used in the Ship-shore interaction (example 5.8) makes the VTS utterance an instruction rather than advice. This is in contrast to what I learned from my site visits to ports in the UK. For advising a vessel regarding anchoring, the UK VTS operators said that they would couch their utterances in non-committal phrases and tell the Master to use his discretion and say, *"vessels of your size usually anchor about there"* (field notes: discussion with UK VTSO 1/1). One former UK VTS operator told me that he would, *"throw everything back at the old man*[97] *and let him decide"* (Field notes; discussion with former UK VTSO 3/5). The VTS operators in the UK appreciated the fine balance between being as clear as possible while being noncommittal. The VTS operators in the UK have an awareness of the legal repercussions if something should go wrong that could be attributable to the utterance of the VTS Operator. The VTS operators of MahaDevi port do not appreciate the legal aspects of their ship-shore interaction which is in part down to training which has been explored in chapter 4, section 4.4.3. The VTS Manual for MahaDevi port[98] states where vessels should make contact with the VTS and reporting is required after dropping anchor at the designated anchorage. Since the anchorage has been designated by the port, the VTS operators clearly instruct vessels to anchor there, assuming no liability. The liability (if any) that VTS operators were to assume by virtue of their VHF utterances needs to be further explored. For the legal liability of VTS for accidents in the VTS area and the accompanying lack in VTS case law see MacWilliam and Cooke (2006). Discrepancy in the provision of VTS services across different countries 'under the same (VTS) label' has been pointed out and concerns have been raised that vessels participating in the VTS could have different perceptions about the role of the VTS and accordingly have different expectations from it (Praetorius et al. 2012).

The merchant ship *Global Atlas* (example 5.9) accordingly proceeded to the designated anchorage, dropped anchor and duly informed the VTS. Now, the vessel only needs to standby and await further instructions to be called inside the port limits.

Example 5.9: Inbound *Global Atlas*, Post Dropping Anchor at Designated Anchorage; Key Communicative Act

3495. **GA –** *Global Atlas* calling, three Echo Echo Yankee three. Motor vessel *Global Atlas* calling, how do you read me? over

[97] Referring to the ship's Captain

[98] The VTS manual was created and uploaded on the website of MahaDevi port in 2013, two years after my fieldwork in the VTS office of the port.

3496. **VTS –** *Global Atlas*, this is VTS go ahead
3497. **GA –** good afternoon. This, now, I have dropped anchor at [omitted] anchorage, one four zero zero sir and noted the time also one four zero zero sir
3498. disturbance
3499. **VTS –** you have dropped anchor at one four zero zero, correct?
3500. **GA –** Yes sir, affirmative sir
3501. **VTS –** okay, copied, thank you, stand by one five, one six
3502. **GA –** Roger stand by one five and one six

The following day around six o'clock in the morning the VTS calls *Global Atlas* to instruct it to arrive at the pilot station. No communication has taken place between the VTS and *Global Atlas* for about 16 hours and it takes several summoning attempts before the vessel responds.

Example 5.10: Inbound *Global Atlas*, Instructions to Arrive at Pilot Station and Pilot Boarding Instructions; Key Communicative Act

8045. **VTS –** *Global Atlas*, *Global Atlas*, VTS
8046. **VTS –** *Global Atlas*, VTS
8047. **VTS –** *Global Atlas*, VTS
8048. **VTS –** *Global Atlas*, VTS
8049. **VTS –** *Global Atlas*, VTS
8050. **VTS –** *Global Atlas*, VTS
8051. **GA –** *Global Atlas*, good morning
8052. **VTS –** *Global Atlas* arrive pilot station one one three zero, one one three zero, copied?
8053. **GA –** VTS, I cannot copy that, please repeat
8054. **VTS –** You arrive pilot station one one three zero, one one three zero, now copy?
8055. **GA –** okay we will proceed to pilot station one one three zero, over, pilot boarding time same time, over
8056. **VTS –** yeah pilot boarding time is only at one one three zero, eleven thirty hours
8057. **GA –** okay copied sir eleven thirty hours for pilot boarding time, please inform me that which side pilot ladder? Over
8058. **VTS –** starboard side half metre above water line, once you underway, inform VTS maintain channel one five all the time. Maintain channel one five all the time
8059. **GA –** alright Sir we will maintain all the time one five and one six okay starboard side, pilot ladder half metre above the water, that's, right?
8060. **VTS –** That's right
8061. **GA –** okay thank you very much for your information we are keep stand by one five and one six prepare for pilot boarding time over
8062. **VTS –** that's correct, thank you.

Providing instructions to inbound vessels to arrive at the pilot station is an important key communicative stage; it is the permission vessels require to physically enter the channel and the call enables the VTS operator to maintain the port traffic schedule. Key communicative stages are utilised by VTS operators to provide pertinent information to vessels based on the stage of their journey in the channel. Key communicative stages can be understood to be members' methods for the communicative management and interactional accomplishment of harbour/fairway navigation. While instructing ships to arrive at the pilot station, the VTS operators also provide pilot boarding instructions to the vessels (line 8058, example 5.11). Nearly 2 hours later, *Global Atlas*, calls the VTS and informs that it is underway.

Example 5.11: Inbound *Global Atlas*, After Getting Underway; Key Communicative Act

8698. **GA –** *MahaDevi* VTS, *MahaDevi* VTS, *Global Atlas*, *Global Atlas*, calling
8699. **VTS –** *Global Atlas*, VTS go-ahead
8700. **GA –** good morning sir we are anchor away, zero seven five zero. We are going to pilot station, over.
8701. **VTS –** Okay Global Atlas you arrive pilot station one one three zero, one one three zero
8702. **GA –** okay thank you, sir one one three zero

Calling and informing the VTS after getting underway serves an important monitoring function. Not all inbound ships report to the VTS when they enter the channel. However, monitoring these vessels is achieved by asking the vessels to call the VTS as soon as they are underway from the anchorage position. This prepares the VTSO to expect the concerned vessels to be shortly entering channel limits. Vessels intending to enter the channel participate in this stage in two ways – either reporting after physically crossing the channel limit reporting line or contacting the VTS after getting underway and conveying their ETA to the pilot station. The VHF interaction of a ship is not limited to communicating with the VTS at key communicative stages. Once inside the channel limits, the ships enter into a conversation with vessels in the vicinity primarily for collision avoidance – to negotiate passing, meeting and overtaking situations. Inter ship interactions are used to obtain and provide *intention display* (see Goffman 1971, 2010 edition) of the participants, so that each can decide upon a mutually agreeable course of action. In the example below (5.12), *Global Atlas* speaks to another inbound vessel, *Bernice*, and slows down to let the latter overtake, as *Global Atlas* had a pilot, an hour after *Bernice*.

Example 5.12: Inbound *Global Atlas*; Inter ship interaction with *Bernice*

9009. **GA –** B*ernice*, *Bernice*, this is on your port bow tanker, tanker calling. How do you read?
9010. **Bernice –** Aah station calling *Bernice*, go-ahead, who is this?
9011. **GA –** *Bernice* good morning sir, may I know the your intentions because I'm proceeding to the pilot station to pick up pilot by eleven thirty over
9012. **Bernice –** yes please, who, who is this? This *Bernice*
9013. **Pilot –** *NAM one two three*, pilot
9014. **Bernice –** VTS and
9015. **NAM 123 –** pilot, *one two three* replying. Go-ahead
9016. **Pilot –** Yeah channel one four
9017. **NAM 123 –** one four

9018. **GA –** port beam tanker *Global Atlas*, *Global Atlas*. Over
9019. **Bernice –** aah copy *Global Atlas* yes, yes, yes, I will go over to the VTS that's correct and to MahaDevi pilot
9020. **GA –** yes what time you will arrive at, to the pilot station? Over
9021. **Bernice –** I'm scheduled for pilot station ten thirty
9022. **GA –** ten thirty so okay I have reduced my speed, so you can cross ahead of me, over.
9023. **Bernice –** Okay, copy thank you, will reduce your speed and I will go ahead of you, that's correct.

In the example above (5.12) *Global Atlas* calls *Bernice*, without identifying itself (line 9009) and *Bernice* makes salient, the lack of identification and asks in line 9010, ‘who is this?’ *Global Atlas* continues without identifying itself and wants to know *Bernice’s* intentions (line 9011). Bernice again wants to know who is calling it (9012). This example shows that not following the standard format of the summons utterance (name of the addressed followed by the addressee) is problematic and delays the establishment of communication between the parties, while the standard format helps to establish contact with the appropriate respondent. Appropriate identification is a prerequisite for safety in VHF communication as accidents have been known to have occurred by misidentification and speaking to the wrong vessel (see Kapoor 2009). *Global Atlas* and *Bernice* are briefly interrupted by a pilot calling the dredger *Nam one two three* (9013-9017), who agree on a different working channel to conduct the rest of the conversation. Changing channels to continue communication is a method used by the members to leave the main VHF channel free for other parties, and it gives the interactants an alternate relatively free channel to undertake communications on. *Global Atlas* calls *Bernice* again and identifies itself in line 9018. *Bernice* responds in line 9019 that its intention is to go for embarking the pilot. The inter ship interaction between *Global Atlas* and *Bernice*, negotiates an overtaking situation between two inbound vessels making way towards the pilot boarding grounds. *Global Atlas* learns that *Bernice* has a pilot an hour ahead of it and slows down to let the latter overtake and go-ahead. Inter ship negotiations for overtaking situations serves to maintain the order of the queue arriving for pilotage and avoid congestion at the pilot station.

Entities call the VTS to learn of the latest traffic situation in the channel. Pilot M 14 is outbound and wants to know the opposing inbound traffic he will face in the channel. He learns that *Global Atlas* is making its way to the pilot station. Members obtain information about the opposing traffic they will encounter in the channel and this method is discussed further in section 6.4.2.

Example 5.13: Inbound *Global Atlas* and *Bernice*; Traffic Update Provided by VTSO

9330. **M14 –** VTS, M fourteen
9331. **VTS –** M fourteen, VTS come in
9332. **M14 –** Yeah VTS, inbound now?
9333. **VTS –** Inbound now one dredger *Lucy two*, at pilot station then after that *Bernice* and then, *Global Atlas*
9334. **M14 –** Yeah okay, *Bernice*, *Global Atlas*

Meanwhile, the designated pilot for *Global Atlas* M 37 calls the VTS and informs that there will be a delay in boarding *Global Atlas* and goes on to add that the Dock Master has been informed of the situation. Immediately, the VTS operator goes on air and instructs *Global Atlas* to stop engines and wait. This is done to manage the delay in pilot boarding and to avoid congestion at the pilot boarding grounds. This is similar to the DIA's announcements to passengers to inform them of a two minute delay in the train arrival after overhearing the controller talk to the train driver (Heath and Luff 2000b).

Example 5.14: Inbound *Global Atlas*; Managing Delay in Pilot Boarding

9585. **VTS –** *Global Atlas*, VTS
9586. **GA –** VTS *Global*
9587. **VTS –** *Global Atlas*, *Global Atlas* VTS
9588. **GA –** this is *Global Atlas* replying.
9589. **VTS –** Please stop engines, stop engines there and maintain your position. I'll come back to you when to start again, when your pilot is ready. I'll come back to you, please stop engines there, over.
9590. **GA –** Roger we stop the engines here thank you.

After 35 minutes, M37, the designated pilot for *Global Atlas*, calls the VTS and informs that he will be heading out to board the vessel and tells the VTS that the vessel should start approaching at slow speed. Pilot-VTS interactions contribute to the monitoring function. The VTS operator consults information on his screen and informs the pilot that *Global Atlas* was already at the pilot boarding grounds. Based on this information, the pilot calculates that it will take about another ten to fifteen minutes for him to board the vessel. While in itself example 5.15 is not a key communicative act, it serves to enhance the situational awareness of all listeners.

Example 5.15: Inbound *Global Atlas*; Pilot going out to board the vessel

9850. **M37 –** VTS, VTS, M thirty seven
9851. **VTS –** M thirty seven, go-ahead
9852. **M37 –** okay just boarding M11 and then heading out, we will start, vessel to start coming at slow speed, please whatever that *Global Atlas* or whatever

9853. **VTS –** she is already at pilot station doing two to three knots
9854. **M37 –** She's already at the pilot station, okay. I am going out full speed out, maybe ten minutes, fifteen minutes I should be on board
9855. **VTS –** yeah, okay

Pilot M 37, next calls the VTS after boarding *Global Atlas* in the key communicative stage of post pilot boarding. This stage informs the VTS that the pilot has successfully boarded the vessel and the vessel can now continue on the rest of its inbound journey. This stage performs a crucial monitoring function in the maintenance of traffic schedule. The eta of the ship and the pilot boarding time should coincide to ensure the smooth and timely flow of traffic. In the case of *Global Atlas*, there has been a half hour delay in pilot boarding at 12 noon as opposed to the eta of 11:30 a.m. Post pilot boarding, the pilot takes on VHF radio communication with the VTS. Noteworthy in the post pilot boarding interaction is the precise, cryptic, telegram-like (see Hutchins 1995) utterance in line 10145.

Example 5.16: Inbound *Global Atlas*, Post Pilot Boarding; Key Communicative Act
10142. **M37** – VTS, M thirty seven
10143. **SP80 –** sorry, one two one zero, yeah
10144. **VTS** – yeah M thirty seven go-ahead
10145. **M37** – one two zero zero, eight point eight, one dock
10146. **VTS –** Okay, roger

At this stage, the pilot is required to provide several key pieces of information to the VTS – the boarding time, vessel name, destination and draft. The pilots are aware of this expectation and within the same sentence/turn communicate all the pieces of information. Pilot M 37 states the boarding time of 12 o'clock and the draft of the vessel as 8.8m and its destination as number one dock, but leaves out the name of the vessel in his utterance (line 10145). However, this omission is not problematic for the VTSO as he is aware that the pilotage of *Global Atlas* is assigned to M 37, and he offers a reformulation of the 'read-back' token as an acknowledgement, 'okay, Roger' (line 10146) (see Froholdt, 2011). The time taken for VTS-pilot VHF communication is very little, as within seconds, key pieces of information are passed in the space of one turn. This is to be compared and contrasted with the VTS-Seafarer VHF interaction in the extended initial contact stage (example 5.5, p. 155-156) wherein a question is framed for each required piece of information leading to about eight lines of questions and the same number of lines for answers. Interruptions, misunderstandings and miscommunications further lengthen the initial contact VHF interaction between VTS operators and seafarers. VTS-pilot communication on the other hand is fast, fluid, structured and predictable. The language used is brief, to the point and communicates pieces of information in quick succession in a staccato manner. Packaging several pre-scripted actions in one turn is what Froholdt (2011) refers to as 'truncated actions' that can make a turn 'elongated, dense and more action saturated'. My finding is similar to Froholdt (2011) as several pieces of information are provided to the VTSO by the pilot in one turn of talk and is intelligible to both participants. Sacks notion of 'membership categories' and 'hearers maxim' (see Sacks 1989, 1992) are useful in analysing port institutional talk, particularly post pilot boarding interaction. The VTS operators and pilots are members of different categories in the harbour and undertake a change in footing (Goffman 1981) to interact with each other. The hearers' maxim is at play as the dense truncated talk of the post pilot boarding interaction is heard unproblematically and is intelligible to both VTS operators and pilots. Undertaking an ethnographic study inspired by ethnomethodological workplace studies helped me understand and appreciate the in situ ordered accomplishment and the content and context of institutional interaction on the VHF radio, which would have otherwise eluded me. I would not have understood the line – *'one two zero zero, eight point eight, one dock'* (10145, example 5.16, p. 165) on its own; the import would have been lost on me.

A common interactional practice (see Kataria and Praetorius 2014) on the VHF is to get in touch with the VTS to obtain information on an entity and thereafter get in touch with the self-same entity to negotiate channel navigation. In the example below, pilot SP 80 communicates with the VTS to learn which pilot is on board *Global Atlas*. After finding out that pilot M 37 is on board *Global Atlas*, pilot SP 80 calls pilot M 37.

Example 5.17: Inbound *Global Atlas*, Pilot-Pilot Interaction; Overtaking Negotiation

10242. **SP 80** – VTS, VTS, SP eighty
10243. **Unknown vessel** – *NAM two one six*
10244. **VTS –** SP eighty, VTS go-ahead
10245. **SP 80** – Haan *Global Atlas* mein pilot kaunsa hai? (transliteration) (translation - yes, who is the pilot on *Global Atlas*?)
10246. **VTS –** *Global Atlas*, pilot M thirty seven
10247. **SP 80** – M thirty seven sahib, SP eighty
10248. **M37** – eighty, go ahead please.
10249. **SP 80** – Good morning Sir I'm on *Shiksha*, just on your starboard quarter, sir just maintain your, my course and speed and overtake you from starboard side
→10250. **M37** – please go-ahead, you can. Starboard side will be clear, because I am passing this *Lucy*, I will be coming more to port, she is lining, I will be lining her up for docking into one dock so starboard side overtaking no problem.
10251. **SP 80** – Okay Sir, thank you Sir.

Contacting the concerned person after gaining information from the VTS is a method largely utilised by pilots to communicate with colleagues. All ships require pilotage in MahaDevi waters and if an inbound vessel is further up the channel beyond the pilot station, it will be piloted, therefore pilot SP 80 posed the question regarding the pilot on-board *Global Atlas*. Communication between pilots is communication between colleagues. The local pilots who pilot vessels up and down the channel largely talk to each other regarding traffic movement in the channel and how they would overtake and/or pass each other safely in the channel using intention displays. The language used is colloquial, conversational and at times vernacular and communicates the familiarity and the relaxed nature of communication between colleagues. There is respect for other pilots and at times pilots address their senior colleagues as 'Sir' or 'Sahib'. The communication between pilots is like a telephone conversation and does not have a tightly scripted predetermined structure. In inter-pilot interactions the pilots envisage the developing traffic situation over time and talk to each other to negotiate passing, overtaking or collision avoidance.

We next hear from pilot M 37 after disembarkation, two hours after he had boarded *Global Atlas*, in the key communicative stage of post pilot disembarkation subsequent to the vessel berthing. The final communicative stage in the journey of an inbound vessel signals the successful culmination of the vessel's journey. It contributes to the monitoring function by informing the VTSO that the vessel has successfully completed its trajectory.

Example 5.18: Inbound Global Atlas, Post Pilot Disembarkation; Key Communicative Act

→10873. **M37** – Thirty seven
10874. **VTS** – VTS, go-ahead
→10875. **M37** – Yes, one three five zero she is inside locks, one four zero zero disembarked pilot
10876. **VTS** – Okay M thirty seven, thank you, one three five zero, one four zero zero, thank you.

The summons–response sequence in example 5.18 above does not follow the pattern of the name of the addressed followed by the addressee. In the opening line the pilot announces his ID as 'thirty seven' and the VTSO self identifies as the respondent. Pilots use their code names to communicate with the VTS and other pilots, and refer to themselves as 'MahaDevi pilot' to speak to merchant ships. Altering the summons-response sequence is a method utilised by members like pilots and VTS operators to economise, reduce air time and quicken interaction. The response of the VTSO (line 10874) does not follow the format 'M 37, VTS' but announces self as the listening respondent. Once again, the pilot truncates and provides more than one piece of information in a single turn (line 10875); the pilot provides the lock entrance time and disembarking time to the VTS. The pilot leaves out the name of the vessel he has just disembarked and this is not problematic for the VTSO. Truncating utterances and leaving out ships' names are methods utilised by the pilots to spend less time on air and both pilots and VTS operators show emic rationality in the pilot – VTD communications.

Inbound *Hong Kong* – The second inbound MahaDevi port ship I follow on its journey inside the channel is merchant vessel *Hong Kong* that had a pilot booking and a pre-booked berth. A key difference between a vessel with a booking (*Hong Kong*) and without one (*Global Atlas*) is that the VTS proactively call the former to maintain the traffic movement schedule for the day and the latter category of vessels call the VTS, as the VTS is unaware of the names of all vessels arriving in the harbour intending to call at the port. Another key difference is that the former are not sent to outer anchorage and are called inside the port limits very quickly. *Hong Kong* was instructed to come inside the port limits less than 12 minutes after it first made its first initial contact with the VTS.

MahaDevi VTS began calling *Hong Kong* on the VHF at 9:30 a.m. in the morning but received no response. The VTS called *Hong Kong* five times and was unable to establish contact. After nearly 45 minutes at 10:15 a.m., *Hong Kong* called the Mumbai VTS and the transcript extract of this first key stage in the ship shore communication (initial contact outside the channel) is reproduced below. The interaction was free from interruptions and took less than 2 & 1/2 minutes (this can be contrasted with example 5.5, page 155-156 which took more than 4 minutes for the same key communicative stage).

Example 5.19: Inbound *Hong Kong*, Extended Initial Contact (pre-booked berth & pilot); Key Communicative Act

Hong Kong – MahaDevi VTS, MahaDevi VTS, this is motor vessel *Hong Kong*, *Hong Kong* calling, come in, over

VTS – *Hong Kong*, MahaDevi VTS, come in

→**Hong Kong –** Good morning Sir, *Hong Kong* eta pilot station will be one three three zero, I repeat eta pilot station will be one three three zero, over

VTS – Okay what is your maximum draft?

→**Hong Kong –** My maximum draft is seven point four five metre, I repeat seven point four five metre

VTS – What is your last port of call?

Hong Kong – Last port of call, Jebel Ali in UAE, United Arab Emirates and maximum draft I repeat seven point four five metre over

VTS – Okay copied draft seven point four five metre, last port Jebel Ali. Okay what is your maximum GRT? GRT, gross tonnage of your vessel

Hong Kong – Roger Sir my gross tonnage one eight one seven seven, I repeat maximum draft is seven point four five metre

VTS – Okay, what is your crew nationality?

Hong Kong – My flag is Hong Kong, nationality also Hong Kong

VTS – Crew nationality Hong Kong, correct?

Hong Kong – Yes that's correct

VTS – Okay, just stand by. Can you confirm your call sign? Call sign of your vessel

Hong Kong – This is a general cargo vessel, general cargo vessel, over

VTS – And what is the cargo?

Hong Kong – General cargo on board, general cargo on board

VTS – Okay copied, *Chong Hong*, just stand by, standby. That is *Hong Kong*, that's correct?

Hong Kong – Yes, that is correct. *Hong Kong* remain standing by on channel one five, thank you

Extended question answer sequences (see Schegloff 2007) are typical of the initial contact in which several essential pieces of information are required to be obtained from the vessel. To avoid misunderstanding and confusion, the VTS operator asks one question per turn at talk and obtains the following information from the vessel – eta, maximum draft, last port of call, gross tonnage, flag of the vessel, nationality of the crew and the cargo on board. Numbers are individually enunciated for clarity (lines 311, 313, 315–317). The 'confirmatory form of talk' (Bailey et al. 2006)/'echo of the utterance' (Hutchins 1995, p.223)/'closed loop communication' (Grech et al. 2008) and 'pre script of the read back' (Froholdt, 2011) feature in lines 316 and 320. The VTS deploys the 'read back' for confirmation and correction (lines 320 and 326). The VTS asks the vessel to confirm its call sign in line 322 and the vessel responds inaccurately in line 323 and says that it is a general cargo vessel. On this the VTS operator turned to me and said, *"see, I'm asking him something and he's answering something else"* (field note, 23 Dec 2010). The initial contact between the VTS and the merchant vessel is driven by posing small questions to the vessel that mirror the SMCP closely (IMO 2002b). These brief, standard, predictable question-answer sequences convey the illusion of fluency requiring minimum linguistic effort until a wrong answer is given that brings the utterance under the spotlight (see breaching experiments in Garfinkel 2002), and gives the VTSO a chance to reflect on it by turning and talking to me (see Lynch 2012). The illusion of fluency cannot be sustained in non-standard loose ship-shore interactions (see Goffman 1963) that are devoid of formulaic scripts and are discussed in chapter section 6.4 on key themes in the data.

After *Hong Kong's* call, the VTSO and I discussed the interaction. VTS operators largely persevere to get the information they need from ships. I had been previously told by the VTSOs that accents of crew from China and the Far East like Korea could pose a challenge. In the case of *Hong Kong*, the VTSO said, *"crew nationality Hong Kong hai par theek bol rahe hai"* (translation – crew nationality is Hong Kong but they are speaking well).

Within 10 minutes after the initial contact, *Hong Kong* is called inside the port limits and given the time to arrive at the pilot station and the pilot boarding instructions[99] in the next key communicative stage.

Example 5.20: Inbound *Hong Kong*, Instructions to Arrive at Pilot Station and Pilot Boarding Instructions; Key Communicative Act

384. **VTS –** Motor vessel *Hong Kong*, *Hong Kong*, MahaDevi VTS calling, come in
385. **Hong Kong –** This is *Hong Kong*, come in please
386. **VTS –** Okay *Hong Kong*, you can arrive pilot station one three three zero, one three three zero you should be at pilot station, confirm, copy
387. **Hong Kong –** Yes, one three three zero, I will arrive pilot station
388. **VTS –** Correct and pilot ladder on starboard side, one metre above water level
389. 3.0
390. **VTS –** *Hong Kong*, VTS come in
391. **Jyot –** MahaDevi VTS, Jyot, Jyot (interruption)
392. (disturbance)
393. **VTS –** *Hong Kong*, MahaDevi VTS
394. **Hong Kong –** MahaDevi VTS, MahaDevi VTS, motor vessel *Hong Kong*
395. **VTS –** Okay *Hong Kong*, confirm copy you can arrive pilot station one three three zero
396. **Hong Kong –** Yes, arrive one three three zero, pilot ladder starboard side one metre above water level
397. **VTS –** Correct one metre above water level and when you are ten miles off pilot station call VTS

The VTSO did not get a confirmation from *Hong Kong* that the vessel had received all the instructions (line 389, no reply). The VTSO made the 'non–response/non–receipt' hearable and called the vessel in line 390. The VTSO ignored the call from *Jyot* and called *Hong Kong* again in line 393. The VTS deals with interruptions and perseveres until the message is satisfactorily received and confirmed by the vessel. The VTS instructs the vessel (397, final line) to call when it is 10 miles off the pilot station which would contribute to the monitoring of its progress

[99] See appendix number 10, p. 278 for appropriate, pilot boarding arrangements.

up the channel. After being called to the pilot station, *Hong Kong* begins to approach the MahaDevi channel. In the transcript excerpt below, *Hong Kong* communicates with the MahaDevi VTS after entering the channel/passing the reporting line.

Example 5.21: Inbound *Hong Kong*, Entering Channel Limits; Key Communicative Act

561. **Hong Kong –** MahaDevi VTS, MahaDevi VTS, this is motor vessel *Hong Kong* calling, come in please
562. **Hong Kong –** MahaDevi VTS, MahaDevi VTS, this is motor vessel *Hong Kong*, call sign Victor Romeo Echo Lima, calling over
563. (lines omitted 563-581)
582. **VTS –** *Hong Kong*, *Hong Kong*, VTS
583. **Hong Kong –** Good morning Sir *Hong Kong* now inbound, inbound passing the reporting line, line. Report to you. Over
584. **VTS –** Confirm your GPS position
585. **Hong Kong –** Roger my GPS position lat, one eight three degree (incomprehensible) the longitude zero five (disturbance)
586. **VTS –** Okay you are now just twenty miles from pilot station, Correct?
587. **Hong Kong –** Pilot boarding position will be one three three zero, over
588. **VTS –** Okay *Hong Kong*, okay, copied how far you from pilot station now?
589. **Hong Kong –** About twenty miles from pilot station
590. **VTS –** Okay, copied. When you fifteen miles from pilot station call VTS again
591. **Hong Kong –** How many miles from pilot station, I call you back again? Over
592. **VTS –** Fifteen miles, fifteen miles, over
593. **Hong Kong –** Roger thanks fifteen miles from pilot station I call you back again. Thank you

In the omitted lines (563-581, example 5.21), the VTS briefly takes three calls from local vessels and a pilot agreed with a ship to switch channels. The VTSO is aware of *Hong Kong's* call and 2 & 1/2 minutes later, calls the vessel. The physical movement of a vessel in the channel is monitored audio–visually (on the VHF and the VTS monitors). To monitor the progress of *Hong Kong* up the channel, the VTSO instructs the vessel to call again when it is 15 miles off the pilot station. Monitoring is a large part of the work of the VTS and interaction is proactively undertaken with ships to facilitate safe movement in the channel. The transcript mirrors the physical progress of *Hong Kong* in the channel. In the excerpt below (5.22), *Hong Kong* reports when it is 15 miles off pilot station as required and it is asked by the VTS operator to maintain the eta of 1330 hours.

Example 5.22: Inbound *Hong Kong*; 15 Miles off Pilot Station

1051. **Hong Kong –** MahaDevi VTS, MahaDevi VTS, *Hong Kong Hong Kong* calling, please come in
1052. **VTS –** *Hong Kong*, VTS

1053. **Hong Kong –** Good morning sir, this is *Hong Kong*, now fifteen miles from pilot station, over
1054. **VTS –** Yeah, okay, copied. You maintain your eta one three three zero at pilot station
1055. **Hong Kong –** Roger, okay sir one three three zero, one three three zero arrive pilot station. Thank you

The VTS monitors the vessels in the channel and an important part of their role is to avoid congestion[100] and manage traffic for seamless movement. Monitoring traffic and its timely progress up the channel, helps the practical realisation of the day's schedule. Traffic monitoring is accomplished by the VTS. *Hong Kong* has been in touch with MahaDevi VTS consistently through its journey in the channel. On nearing the pilot station it initiates contact with the pilot. The VTS responds when *Hong Kong* calls the pilot in the following excerpt. In line 3 of the extract below, *Hong Kong* does not ask the VTS to call the pilot on its behalf, the line is spoken in a manner to suggest that the vessel had called the pilot and not the VTS, hence the pilot as the identified respondent needs to answer. The VTS tells *Hong Kong* to keep coming to the pilot station where the pilot will meet the vessel. Reassuring the vessel, when it is unable to speak to the pilot is utilised by the VTS to keep the traffic moving to maintain traffic schedule.

Example 5.23: Inbound *Hong Kong*; Initiating Contact with Pilot

1641. **Hong Kong –** MahaDevi pilot, MahaDevi pilot, *Hong Kong*, *Hong Kong*, calling, come in please
1642. **VTS –** *Hong Kong*, VTS
1643. **Hong Kong –** VTS, call MahaDevi pilot
1644. **VTS –**You keep coming, keep coming, pilot will be meeting at the pilot station. You please keep coming
1645. **Hong Kong –** Okay, thank you very much

Subsequently the VTS learned that there would be a delay in pilot boarding time for *Hong Kong* and accordingly asked the vessel to slow down and delay its arrival at the pilot station by 15 minutes. A delay in pilot boarding affects the traffic movement schedule which needs to be re-adjusted and interactionally managed. Vessels are asked to slow down to absorb the delay and match their new eta to the new pilot boarding time. This is similar to the airline operator in Suchman (1993) who delays giving the go-ahead to an aircraft to maintain a one at a time queue of arriving airplanes.

[100] Congestion can take place near the pilot Station where several ships could be waiting for pilots.

Example 5.24: Inbound *Hong Kong*; Managing Delay in Pilot Boarding

1717. **VTS –** *Hong Kong*, VTS
1718. **Hong Kong –** VTS, *Hong Kong*, go-ahead
→1719. **VTS –** Please take it easy, come to pilot station one three four five
1720. **Hong Kong –** Roger come to pilot station one three four five, is correct

The communicative trajectory of a vessel includes VHF talk with other participants in the vicinity. *LS Supplier* is an outbound vessel[101] and the VTS asks *LS Supplier* to confirm how it would pass with inbound *Hong Kong*. In example 5.25, the VTSO initiates inter ship interaction on confirming how to pass. While such interaction may be antithetical to the COLREGs (IMO 1972), the practice is a part of the communicative fabric of the port VHF radio and the trend is likely to continue. For a sociological interpretation of the COLREGs see Belcher (2002) and for the increase in the use of AIS for collision avoidance on VHF, see Bailey (2005). The inter-ship interaction is a method deployed to confirm meeting, passing, overtaking or collision avoidance situations. VTS' initiation of inter-ship interaction can be understood as the exercise of control over traffic movement in the channel.

Example 5.25: Inbound *Hong Kong*; VTS Initiated Inter Ship Interaction

1892. **VTS –** *LS Supplier*, VTS
1893. **LS Supplier –** VTS, *LS Supplier*
→1894. **VTS –** How you will be passing with the inbound vessel *Hong Kong*?
1895. **LS Supplier –** Port to port
→1896. **VTS –** You confirm from the vessel, inbound vessel
1897. **LS Supplier –** Okay Sir, will. *Hong Kong*, *Hong Kong*, *LS Supplier*
→1898. **Hong Kong –** Yes this is *Hong Kong*, confirm we'll be passing port to port over
→1899. **LS Supplier –** Roger Sir, port to port
1900. **Hong Kong –** Okay thank you port to port

Close to the pilot station, *Hong Kong* calls MahaDevi pilot again. Successfully boarding the pilot is an important activity that needs to be interactionally coordinated. *Hong Kong* calls the pilot to initiate contact. Upon failing to receive a response from the pilot, *Hong Kong* calls the VTS who responds with a traffic update. The designated pilot for *Hong Kong*, M 20, is engaged in piloting another outbound ship and will get in touch with the vessel subsequently.

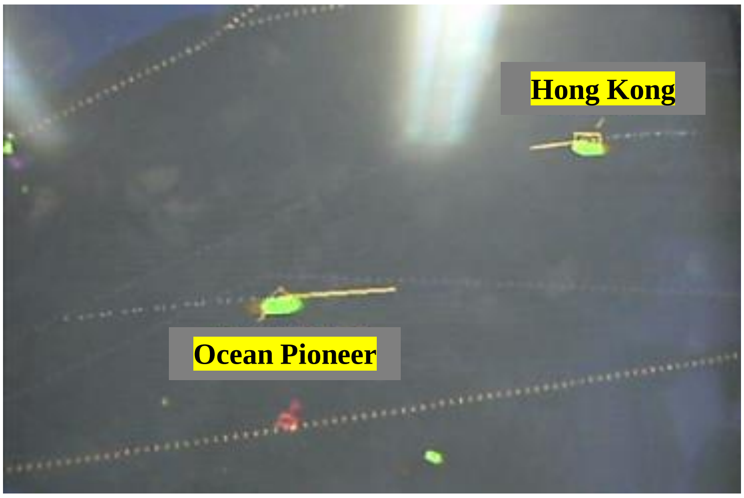
[101] This is to be seen in the light of usual practice that outbound vessels that have disembarked the pilot usually increase their speed as they are going out to sea and inbound *Hong Kong* will be in front of *LS Supplier*.

Example 5.26: Inbound *Hong Kong*; Contact with VTS and Traffic Update

1949. **Hong Kong –** MahaDevi VTS, MahaDevi VTS, *Hong Kong*, *Hong Kong*, calling, come in please
1950. **VTS –** *Hong Kong* VTS, go-ahead
1951. **Hong Kong –** Good afternoon Sir we have arrive[102] at pilot station. Over
1952. **VTS –** Okay copied, thank you
1953. **VTS –** *Hong Kong*, VTS
1954. **Hong Kong –** VTS, *Hong Kong*
1955. **VTS –** This outbound vessel is *Ocean Pioneer*, *Ocean* Pioneer, ahead of you, outward bound. Copy
1956. **Hong Kong –** *Ocean Pioneer*, is correct?
1957. **VTS –** That's correct, that's correct
1958. **Hong Kong –** Okay, thank you

Informing vessels of traffic coming from the opposite direction is an important institutional practice in the port that prepares and informs all concerned to take avoiding action and is achieved through active monitoring. The VTSOs provide snapshots of the traffic situation through their utterances. They paint word pictures of the traffic to enhance the situational awareness of participants. The dynamic traffic scenario changes rapidly and requires constant monitoring and updating.

Figure 5. 5: Inbound *Hong Kong* and *Ocean Pioneer* on its way out



Source: Student (picture taken and used with permission and suitably anonymised)

[102] The grammar is not always correct. This utterance (line 1951) does not mean that the vessel has arrived at the pilot station. It means that the vessel is on its way. It is to be seen in conjunction with Figure 5.5. The VTS Mentions outward bound *Ocean Pioneer*, ahead of *Hong Kong* and it meets the outbound vessel before it arrives at the pilot station.

Example 5.27: Inbound, *Hong Kong*; Contact with VTS and Traffic Update

2108. **Hong Kong –** VTS, VTS, *Hong Kong* calling, over
2109. **VTS –** Who is calling VTS?
2110. **Hong Kong –** Good afternoon Sir, this is *Hong Kong, Hong Kong* fifteen minutes to pilot station, I I I I'd like to know, the pilot on arrival, right?
→ 2111. **VTS –** *Hong Kong* (1.0) you are two miles from pilot station. Keep coming with minimum speed. Keep coming with minimum speed
2112. **Hong Kong –** Roger, thanks

The VTS operator in example 5.27 monitors *Hong Kong* and informs the vessel that it is still 2 miles from the pilot station (line 2111). Pilot M 20, the assigned pilot for *Hong Kong* has disembarked a ship, a short while ago and is outbound to board *Hong Kong*. The vessel, the VTS and the pilot all feature in the extract below and the interaction makes it clear for the participants and listening bystanders that Pilot M 20 will board *Hong Kong* shortly.

Example 5.28: Inbound *Hong Kong*, VTS and Designated Pilot; Preparation for Pilot Boarding; Key Communication

2197. **M20 –** VTS, M twenty
2198. **VTS –** M twenty, VTS, good afternoon, go-ahead
2199. **M20 –** Good afternoon my disembarking time is one three two five and now please tell me the, what is the location of this (.) vessel coming at (.) this, *Hong Kong*?
→ 2200. **VTS –** *Hong Kong* now distance is from pilot station one point four miles doing six point five knots
2201. **M20 –** Yeah okay she can keep coming at this speed, keep coming up the channel I'm already outbound passing number four line, I will board her.
2202. **VTS –** *Hong Kong*, VTS
2203. **Hong Kong –** This is (.), VTS go ahead sir
2204. **VTS –** Yeah you slow down to minimum speed, slowdown to minimum speed
2205. **Hong Kong –** Roger Sir, keep minimum speed
2206. **M20 –** VTS, what is the speed? Six knots? (disturbance)
→ 2207. **VTS –** M 20, VHF is distorted, distorted
→ 2208. **M20 –** I'm on the main VHF now, what is the speed of the ship?
2209. **VTS –** Six point five knots
2210. **M20 –** Six point five is okay. Okay, *Hong Kong*, pilot
2211. **Hong Kong –** Pilot, MahaDevi pilot, *Hong Kong*, go ahead sir
2212. **M20 –** Yeah what is your present speed now?
2213. **Hong Kong –** My present speed six point four four, six point four four knots, over
→ 2214. **M20 –** Yeah okay, your pilot is already outbound. I will be there in about ten minutes. You can keep coming up in the channel at the same speed. You can keep coming. Keep your pilot ladder on the starboard side one metre from water level
2215. **Hong Kong –** Roger I keep coming to pilot station. Pilot ladder is ready on starboard side, one metre above water. Over.
2216. **M20 –** Yeah remain on the starboard side of the channel follow the main channel and keep coming
2217. **Hong Kong –** Roger thanks

In line 2207, the VTSO blames the disturbance on the VHF and holds the technology liable. Since the communication is with a senior pilot, the VTSO imputes the blame on the VHF. This can be contrasted with the interaction with a shipboard Seafarer, to whom, the VTSO says, *'you're distorted'* (example 5.5, p. 155-156). The pilot counters with the justification (see Schegloff 2007) that he is on the main VHF channel and consequently above blame. The interactants utilise 'footing' (see Goffman 1981) and build it into their recipient design to personalise the interaction. In line 2214, the pilot owns the pilotage assignment of *Hong Kong* and personalises the utterance by saying, *'your pilot is already outbound'*. This is important communication in the journey of an inbound vessel, as it prepares it to expect the pilot and confirm the pilot boarding arrangements.

In the extract below, *Hong Kong* has arrived close to the pilot station and interacts with the VTS and subsequently with the designated pilot. *Hong Kong* is an international merchant vessel with a foreign crew and MahaDevi VTS looks out for such vessels. At times, even when *Hong Kong* calls the pilot and does not get an answer, the VTS answers. This is an attempt by the VTS to reassure the vessel and support it on its way. In the example below, the VTS operator ignores *Lunar Eclipse's* summons for *Chandra* and responds to *Hong Kong* to move the call forward. The VTSO assures *Hong Kong* that the pilot will call the vessel and informs it of two outbound dredgers in the channel.

Example 5.29: Inbound *Hong Kong*; Traffic Update

2266. **Hong Kong –** MahaDevi pilot, MahaDevi pilot, this is *Hong Kong* calling, please come in
2267. **LE** – *Chandra*, *Lunar Eclipse*
2268. **VTS –** *Hong Kong*, VTS go-ahead
2269. **Hong Kong –** Good afternoon sir, *Hong Kong*, now off pilot station. I'm waiting for pilot and what time the pilot will board? Over
2270. **VTS –** Pilot is already outbound for you, you just stand by, pilot will call you and there is a dredger, *Kajal twenty*, *Kajal twenty* is outward bound and then *NAM one two three* both the dredgers outward bound
2271. **Hong Kong –** Roger, thanks

Example 5.30: Inbound *Hong Kong*, Pilot-Ship Interaction; Channel Switching

2283. **Pilot –** *Hong Kong, Hong Kong,* pilot
2284. **Hong Kong –** Pilot, *Hong Kong*, go-ahead
2285. **Pilot –** Yeah come to channel one four
2286. **Hong Kong –** One four

Channel switching takes place when the interacting parties wish to speak on another channel and leave the main VHF channel free. The practice of channel switching is interactionally achieved by mutually agreeing on the channel before switching (lines 2285 & 2286). In the example above, pilot M 20 and *Hong Kong* agree to switch to channel 14. Any interaction between the pilot and the vessel on channel 14 would not be picked up by the VTS[103] or me as the VTS monitors channel 15 and I recorded the interaction on the same channel. This does not take away from the ship-shore communicative trajectory of the vessel, as pilot-ship interaction at this stage is concerned with achieving pilot boarding and example 5.50, p. 191-192 is an indication of pilot-ship interaction during the pre-pilot boarding stage of an inbound vessel's journey. When a vessel switches channels on one VHF set and talks to an entity, the second VHF set should remain attuned to the main working channel of the port. In the case of *Hong Kong*, one set should be on 15 (MahaDevi channel) and the other on 14 to talk to the pilot. After speaking with the pilot, *Hong Kong* can switch back to 16 (the international channel for distress communication). While *Hong Kong* is close to the pilot station waiting for the pilot, it speaks with other vessels in the vicinity to clarify how they would pass it in the channel. In the extract below, MV *Hong Kong* is trying to contact *Kajal 20*[104] and refers to it in an unfamiliar format, *Kajal XX* (line 1) to which *Kajal 20* does not respond. The VTS knows the identities of the vessels in the channel and asks *Kajal 20* to reply (line 2302) and engage in inter ship interaction to confirm/agree on how to pass. MahaDevi VTS does not consider inter-ship interaction on passing as inappropriate. The attempt of the VTS to ask *Kajal 20* to reply to *Hong Kong* and respond when *Hong Kong* calls the pilot can be understood as monitoring and controlling traffic movements and attempts to assist the foreign vessel in MahaDevi waters.

Example 5.31: Inbound *Hong Kong*, VTS Initiated Inter Ship Interaction; Intention Display

2299. **Hong Kong –** Outbound vessel *Kajal*, *Kajal XX*, this is inbound vessel, *Hong Kong*, ahead of you, calling, over
2300. **VTS –** *Kajal twenty*, *Kajal twenty*, VTS
2301. **Kajal 20 –** VTS, *Kajal twenty*
2302. **VTS –** The inbound vessel is calling you, please reply
2303. **Kajal 20 –** Okay Sir
2304. **Hong Kong –** Outbound vessel *Kajal*, *Kajal XX*, this is, *Hong Kong* calling, over
2305. **Kajal 20 –** Okay sir, *Chong Hong*, this is *Kajal twenty*

[103] Even though VTS does not monitor VHF channel 14, interaction on it is recorded by the VTS equipment.

[104] *Kajal 20* appears as *Kajal XX* on the screens of the VTS. Roman numerals have been used to denote the number 20. Here I have used the spoken form of *Kajal 20* to refer to the vessel.

2306. **Hong Kong –** Okay, good, good afternoon Capt port bow, I will pick up pilot and the, so we will pass port to port, to red to red, over
2307. **Kajal 20 –** Okay sir, confirm with you port to port
2308. **Hong Kong –** Yes that's correct, thank you
2309. **Kajal 20 –** Welcome

Hong Kong does not get the name of *Kajal 20* (2299 & 2304) correct and in a similar vein *Kajal 20* refers to *Hong Kong* as *Chong Hong*. The VTS monitors were receiving AIS inputs from both the vessels accurately, implying that both vessels had access to the same AIS information. The communicating seafarers on-board *Hong Kong* and *Kajal 20* have difficulty in understanding and pronouncing each other's names. Communication perseverance serves to reduce misunderstandings. *Kajal 20* is the first outbound dredger with whom *Hong Kong* has confirmed how to pass by confirming intention (example 5.31, p.177-178). *Hong Kong* has called the pilot several times and in the excerpt below, the VTS calls the pilot to inform him of the current location of *Hong Kong* and the pilot informs that he will be boarding the vessel shortly. Calling the designated pilot of a vessel serves to alert both the pilot and the vessel of the developing situation, in addition to other listeners.

Example 5.32: Inbound *Hong Kong*; VTS-Pilot Interaction

2311. **VTS –** Pilot M twenty, VTS
2312. **M20 –** VTS, M twenty
2313. **VTS –** M twenty, now *Hong Kong* passing pilot station
2314. **M20 –** Yeah, right I am very close to it. I will be boarding shortly
2315. **VTS –** Okay, thank you

Meanwhile, as *Hong Kong* waits for the pilot to board, the vessel continues to communicate with other vessels in the channel regarding how they would pass. The second outbound dredger (after *Kajal 20*) in the channel is *NAM 123* (see example 5.33, p.178). The VTS had duly informed *Hong Kong* of the opposing traffic it is likely to encounter and accordingly the vessel engages in inter-ship interaction to provide, obtain and confirm 'display of intention' of the vehicular units.

Example 5.33: Inbound *Hong Kong*, Inter Ship Interaction; Intention Display

2374. **Hong Kong –** Motor vessel *NAM one two three*, this is *Hong Kong*, calling over
2375. **NAM 123 –** *Hong Kong, NAM one two three*
2376. **Hong Kong –** Good afternoon Captain, we will pass port to port, over
2377. **NAM 123 –** Yeah, we will pass port to port, red to red
2378. **Hong Kong –** Okay, thank you sir

The Pilot has boarded *Hong Kong* and subsequent to pilot boarding is required to communicate the name of the vessel, the pilot boarding time and the draft which M 20 does in the excerpt below and goes on to ask about other traffic in the channel. Post pilot boarding is one of the key stages of ship-shore communication. Once on-board, M 20 takes on the communication with the VTS and his VHF utterances are attributed to the communicative trajectory of *Hong Kong*.

Example 5.34: Inbound *Hong Kong*, Post Pilot Boarding; Key Communicative Act

2435. **M20 –** VTS, M twenty
2436. **VTS –** M twenty, VTS
→ 2437. **M20 –** One four zero zero, boarded *Hong Kong*, draft is seven point four five metres. Now can you please check the traffic for me from one dock[105]
2438. **VTS –** Okay, copied
2439. **M20 –** And any traffic outbound now?
→ 2440. **VTS –** There is a dredger, is outward bound, *NAM one two three* just cleared and no outbound presently now
2441. **M20 –** is where?
→ 2442. **VTS –** *one two three* outward bound, just passed now
→ 2443. **M20 –** Outward bound from where, inner anchorage?
→ 2444. **VTS –** Now passing, number twenty four line, twenty four line
2445. **M20 –** Okay so now I'm going out and what about this, any ship is also coming out from one dock?
2446. **VTS –** *Jyot* is coming out because this docking is cancelled by one dock, M four is coming out for anchorage two, number four line.
2447. **M20 –** number two anchorage, okay thank you and pilot is M four, correct?
2448. **VTS –** That's correct
2449. **M20 –** Thank you

The VTSO did not inform the pilot about the location of dredger *Nam 123* (line 2440) and the pilot questioned the VTS twice before he received the required response in line 2444. The delay in confirming the position of dredger *NAM 123* could be because the VTSO did not consider the dredger relevant to navigation situation of *Hong Kong* as the outbound dredger had already passed it. The VTS is considered a repository of updated traffic information. From the VTS, entities learn of the current traffic picture in the channel at the time and thereafter, if required begin to call the vessels that populate the latest traffic picture. Entities obtain the name of other vessels from the AIS and thereafter question the VTS about the identified targets. Pilots keep themselves informed about pilots on-board other vessels in the channel and pilot M 20 navigates, talks and negotiates his way through till *Hong Kong* is safely alongside and he

[105] Traffic from number one dock uses the main channel to enter or depart the dock channel.

disembarks. On the VHF pilot M 20 can hear the developing picture of traffic movement in the channel. As *Hong Kong* comes further up the channel, it has to take into account other outbound vessels that could be in its path. Inbound *Hong Kong* needs to keep clear of vessel *Jyot* coming out of number one dock and two outbound Sagar port vessels entering the main channel. The following extracts show the interaction of pilot M 20 of *Hong Kong* with other pilots.

Example 5.35: Inbound *Hong Kong*, Inter Pilot Negotiations; How to Pass

2524. **M20** – VTS who is the pilot on this *Devi Lakshmi*?
2525. **5Bay** – VTS, *Five Bay*
2526. **VTS** – SP eighty one, SP eighty one *Devi Lakshmi*, *Lakshmi* followed by *Jharna* SP eighty four
2527. **M20** – okay SP eighty one, M twenty
2528. Lines omitted
2529. **SP81 –** Good afternoon sir, SP eighty one, outbound on *Devi Lakshmi, Lakshmi*. Where have you reached?
2530. **M20 –** Yeah, I am somewhere close to number three-four line, please pass green to green with me, green to green. Right now I'm in the centre of the channel because I've got a ship coming out going to number two anchorage so you please remain on the eastern side of the Channel, I repeat eastern side of the Channel, pass green to green with the inbound vessel *Hong Kong* passing number four line.
2531. **SP81 –** Roger sir I will remain to eastern side of the Channel till North buoy remain to eastern side of the Channel
2532. **M20 –** Okay thank you very much you can inform the *Jharna* and the pilot following you
2533. **SP81 –** Roger SP eighty four, eighty one
2534. **SP84 –** Copied we'll follow you and we'll keep to starboard and pass starboard to starboard

The VTS operator ignores the summons from *Five Bay* in line 2525 and proceeds to answer pilot M 20. The VTSO informs pilot M 20 of the ID of pilots on-board the two outbound Sagar port vessels that *Hong Kong* will encounter on the final leg of its journey to its berth. The inter-pilot interactions have a similar purpose to the inter-ship communication, which is the negotiation of passing, overtaking and collision avoidance situations. The major difference between inter-pilot and inter-ship interaction is that the former has a more personalised footing by virtue of being communication between colleagues (line 2530)(Goffman 1981).

Nearly 2 hours after the pilot had boarded *Hong Kong* (1400 hours), the pilot calls the VTS (1550 hours) at the final key communicative stage of an inbound vessel's journey – post pilot disembarkation. This serves the monitoring purpose as VTS are aware that the vessel has completed its traffic movement for the day.

Example 5.36: Inbound *Hong Kong*, Post Pilot Disembarkation; Key Communicative Act

3611. **M20 –** VTS, M twenty
3612. **VTS –** M twenty, VTS
→3613. **M20 –** yeah my last, last timing at number ten berth, first line one five one five and all fast one five five zero
→3614. **VTS –** Sir one five one five, one five five zero
3615. **M20 –** yeah that is correct
3616. **M20 –** Hong Kong, Hong Kong
3617. **VTS –** Roger

The pilot communicates that the vessel is alongside number 10 berth and was made 'all fast' at 1550 hours. The cryptic 'confirmatory form' (see Bailey et al. 2006) or the 'read back' (Froholdt, 2011) in line 3614 is intelligible to both the VTSO and the pilot and is indexical (see Garfinkel 2002) of the inference rich membership categories of the communicating participants (see Sacks 1989). With the vessel safely alongside its designated berth, the inbound trajectory of *Hong Kong* is complete.

The VHF interaction in a vessel's journey in the port is not just the communication at key communicative stages, but the entire thread of vessel communication, that taken together is the narrative of the vessel's journey in the harbour. An inbound vessel contacts the MahaDevi VTS before entering the MahaDevi port limit and several times during the course of its journey through the channel. An analysis of the data reveals that inbound ships bound for MahaDevi first call the VTS from outside the port limits. Depending upon the day's docking programme/schedule, the VTS operators call the ships in ample time, giving the vessel adequate notice to prepare the vessel and set sail. Once under way the vessel could call the MahaDevi VTS upon entering port limits. Thereafter, the vessel calls again when nearing the pilot station. At this juncture the vessel also communicates with the pilot regarding the instructions for pilot boarding and subsequent to pilot boarding; the pilot takes on the VHF communication with the MahaDevi VTS until he disembarks after berthing/anchoring the vessel as the case may be. This completes the trajectory of a typical inbound vessel. The key communicative stages of an inbound MahaDevi vessel are – initial contact outside port limits, instructions to arrive pilot station (pre-booked berth and pilot) or to drop anchor in outer anchorage (no booking), after getting underway, upon entering channel limits, post pilot boarding and post pilot disembarkation. The only difference between a vessel that arrives without a pre-booked berth and one that has a booking is that the former is instructed to drop anchor at the designated anchorage until plans are put in place to call the vessel inside.

Figure 5. 6: Inbound MahaDevi vessels – the process, key communicative stages and participants

Source: Student

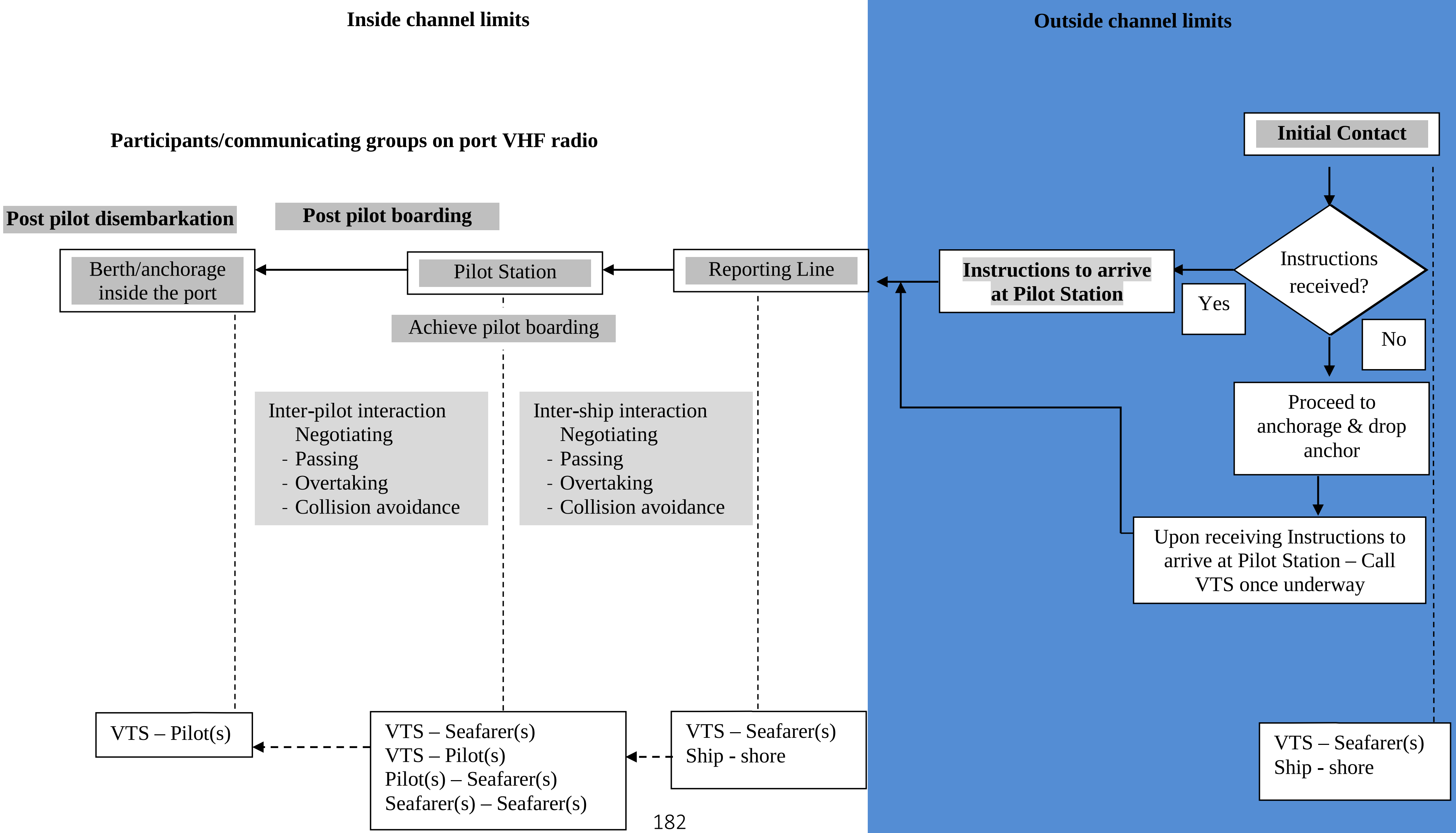


Figure 5.6 on page 182 captures the trajectory of an inbound MahaDevi port vessel. The figure shows the process of managing an inbound vessel along with the key stages of communication, the communicating participants/members and some of the members' methods for the accomplishment of harbour and fairway navigation.

In the following section, I explore the communicative management of outbound MahaDevi port vessels. I follow one vessel on its outbound journey *MahaRishi Muni* from MahaDevi port to the high seas. Following the narrative of one outbound ship is considered sufficient as the procedure for all outbound vessels is similar. There are differences for inbound vessels as some arrive with a pre-booked berth and some without. However, in the case of outbound vessels, no such differences exist; all ships leaving the port need to have obtained the mandatory clearances certifying that cargo work has been completed, all port dues have been cleared and the vessel is now free to leave.

5.4.2.ii Outbound MahaDevi Port Vessels

The procedure for the communicative management of outbound MahaDevi port vessels starts with the vessel calling the VTS and giving its 'readiness' to sail. The VTS passes on this information to the office which sets the wheels in motion and the office, plans and schedules the vessel's departure based on the 'ready to sail' time given by the vessel. In the excerpt below, *MahaRishi Muni* calls to communicate its readiness to sail at 18:00 hours. This is a key communicative act in the outbound vessel's journey.

Example 5.37: Outbound *MahaRishi Muni*, 'Ready to Sail'; Key Communicative Act

4143. **MRM –** MahaDevi VTS, MahaDevi VTS, *MahaRishi Muni*
4144. **VTS –** *MahaRishi Muni*, VTS
4145. **MRM –** good evening once again sir, we'll be ready for sailing out at around after half an hour at around eighteen hundred hours
4146. (interruption)
4147. **VTS –** maximum draft?
4148. **MRM –** just a minute, standby
4149. **Unknown vessel** – one one
4150. **MRM –** VTS, *Rishi Muni* my maximum draft is six point eight metres
4151. **VTS –** okay confirm Port all Clear on-board?
4152. **MRM –** yeah we are receiving it now
4153. **VTS –** just confirm it
4154. **MRM –** yeah okay then I'll confirm it and let you know

The ‘ready to sail’ VHF call announces the name of the vessel which needs to be processed for departure. The VTS operator questions the vessel as to whether it has the mandatory ‘Port all Clear’ (PAC) on-board (line 4151) and receives an unconfirmed response, to which the VTS operator responds, *‘just confirm it’* implying that the readiness call is incomplete without confirmation of receipt of the mandatory PAC certificate on-board. This also attests to the authority of the VTS that the call will not be entertained if the vessel cannot confirm to be in possession of the mandatory certificate. *MahaRishi Muni* calls within 5 minutes (example 5.38) to confirm that it has the required certificate now on-board and the VTS operator replies that he will get back to the vessel. The key communicative stage of providing, ‘readiness to sail’ is accomplished by confirming the availability of PAC on-board which allows the vessel to be processed for departure.

Example 5.38: Outbound *MahaRishi Muni*; ‘PAC confirmed’
4168. **MRM –** MahaDevi VTS, MahaDevi VTS, *MahaRishi Muni*
4169. **VTS –** *MahaRishi* Muni, VTS go-ahead
4170. **MRM –** Sir, confirm the Port all Clear is on board
4171. **Alpha –** who is calling Alpha?
4172. **VTS –** okay copied, standby, I'll come back to you
4173. **MRM –** standing by one five

Once the information is passed to the office, the VTS operators wait to receive the traffic schedule and the vessel needs to wait until it receives a call from the VTS regarding the pilot boarding time and further instructions. *MahaRishi Muni* calls the VTS three times to learn of its pilot boarding time and the VTS operator is aware which direction the call is likely to take. The examples below (5.39-5.41) are three calls the vessel made to the VTS until 8 p.m.

Example 5.39: Outbound *MahaRishi Muni*; Call to VTS (around 6 p.m.)
4356. **MRM –** VTS, VTS, *MahaRishi Muni*
4357. **VTS –** *MahaRishi Muni* copied your readiness, standby
4358. **MRM –** copied sir, standing by

Example 5.40: Outbound *MahaRishi Muni*; Call to VTS (around 7:30 p.m.)
5115. **MRM –** VTS, VTS, *MahaRishi Muni*
5116. **VTS –** *MahaRishi Muni*, VTS go-ahead
5117. **MRM –** good evening once again sir, can you please confirm the pilot boarding time for us
5118. **VTS –** just stand by, just standby.
5119. **MRM –** standing by

Example 5.41: Outbound *MahaRishi Muni*; Call to VTS (around 8 p.m.)

5408. **MRM –** MahaDevi VTMS, MahaDevi VTMS, *MahaRishi Muni*
5409. **VTS –** *MahaRishi Muni*, you just stand by channel one five, when your pilot confirm, we'll let you know, channel one five, over
5410. **MRM –** Roger Sir I'm standing by on channel one five and ready for shifting to outer
5411. **VTS –** okay so you're shifting to outer and coming back inside. over
5412. **MRM –** negative
5413. **VTS –** you are going outer anchorage? Where are you going?
5414. **MRM –** I'll be going to Fujairah
5415. **VTS –** Fujairah, going to direct Fujairah, correct. Just stand by, we'll let you know when your pilot confirm
5416. **MRM –** yeah okay sir standing by

Upon receiving the confirmation from the office, the VTS calls the designated ships and informs them of the pilot boarding time. This is a key communicative stage as it commences the preparation required by the vessel to undertake its outbound journey and informs all listeners (participants and bystanders) to expect the vessel to enter the navigation channel at the scheduled time. The VTS calls *MahaRishi Muni* around 8:45 p.m. and informs the vessel to get ready and expect the pilot to board the vessel between 11 and 11:15 p.m.

Example 5.42: Outbound *MahaRishi Muni*, Pilot Boarding Information; Key Communicative Act

5681. **VTS –** *MahaRishi Muni*, MahaDevi VTS
5682. **MRM –** MahaDevi VTS, *MahaRishi Muni* replying go-ahead sir
5683. **VTS –** *MahaRishi Muni* you keep everything ready, pilot (.) pilot will board you at two three, two three zero zero to two three one five
5684. **MRM –** okay copied Sir pilot will board at two three zero zero to two three one five, roger Sir local time today

In addition to the pilot boarding time, the VTS provides information on the pilot boarding arrangements to be readied by the vessel. Ideally, this information should be included in the same VHF call that conveyed the pilot boarding time (example 5.42). The VTS omitted to provide this information and calls the vessel close to 11 p.m., and informs it of the required pilot boarding arrangements. Noteworthy is that while the VTSO forgot to give this information, the duty officer on board also forgot to request it from the VTS. Given that the pilot boarding time is almost upon the vessel, it is late to provide this information. The VTS operator in line 6187, example 5.43 advises the ship to rig the combination ladder[106] on the

[106] See appendix 11, page 301 for pilot boarding arrangements.

port side while the vessel had rigged it on the starboard side. Passing key information to the vessel in a timely manner is a prerequisite to safe and efficient traffic management, which has been overlooked at this juncture.

Example 5.43: Outbound *MahaRishi Muni*, Pilot Boarding Arrangements; Key Communication

6181. **VTS –** *MahaRishi Muni*, VTS
6182. **VTS –** *MahaRishi Muni*, *MahaRishi Muni*, MahaDevi VTS calling, come in
6183. **VTS –** *MahaRishi Muni*, VTS
6184. **MRM –** VTS *Rishi Muni* replying, go-ahead
→6185. **VTS –** *MahaRishi Muni*, VTS, you be ready in all respects (incomprehensible) rig pilot ladder port side one metre above water level.
6186. **MRM –** Sir we are having combination ladder ready on the starboard side.
→6187. **VTS –** No, port side, combination port side if your free board is higher above ten metres[107], make it combination port side, one metre above water level, make it three shackles[108] on deck and wait for pilot.
6188. **MRM –** Copied sir pilot ladder combination on port side, one metre above water level and three shackles on deck and wait for pilot.

Delay in providing information may translate into delay in the departure of the vessel, thereby affecting the planned traffic movement schedule. However in this case, no delay is caused as the designated pilot, M 20, is running late and calls *MahaRishi Muni*, close to 11:30 p.m. (15 minutes after the scheduled pilot boarding time window). Pilot boarding is an activity that needs to be negotiated on the VHF radio with the vessel, and when the main VHF channel is busy, pilots tend to agree on a different working channel with the vessel and switch channels for further communication. In Bailey (2005), the researcher followed the thread of the VHF radio conversation of the parties to the next agreed channel. Unlike Bailey (2005), I did not have the facility to follow VHF conversations to the next channel (the hardware and software issues of data procurement have been discussed in detail in chapter 3 on methods), nevertheless that does not take away from the analysis as in some cases pilots switch channels to communicate with the vessel to negotiate pilot boarding, while in others, the pilots undertake the activity on the main VHF channel itself, where I can record and analyse it (see examples 5.45 and 5.46, p. 187).

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[107] The side of rigging the pilot ladder has to do with the wind direction and pilot boarding is usually undertaken from the leeward side.
[108] In preparation for pilot boarding, the VTS operator wants the vessel to heave up three shackles of anchor.

Example 5.44: Outbound *MahaRishi Muni*, Pilot-Ship interaction, pre boarding; Key Communication

6386. **Pilot –** *MahaRishi Muni*, pilot
6387. **MRM –** okay pilot, *MahaRishi Muni*
6388. **Pilot –** please come to channel one four
6389. **MRM –** channel one four

The VTS instructs the vessels to be ready in all respects and expect the pilot at the scheduled pilot boarding time. In addition to the VTS' instructions to ships, pilots usually communicate with their vessels 10 minutes before pilot boarding to inform the vessel to expect the pilot shortly and pass on instructions, if any. The following examples (5.45 and 5.46) are of pilot–ship pre boarding interaction for outbound vessels and give an indication of what pilot M 20 may have said to *MahaRishi Muni*, prior to boarding the vessel.

Example 5.45: Outbound *Offshore Supplier*, Pilot-Ship interaction, pre boarding; Key Communication

2792. **Pilot –** *Offshore Supplier*, MahaDevi pilot
2793. **OS –** station calling Offshore *Supplier*, come in please
2794. **Pilot –** *Offshore Supplier*, ready to sail?
2795. **OS –** Yes sir, ready sir
2796. **Pilot –** okay pilot coming to you in ten minutes ten minutes
2797. **OS –** okay sir, ready sir
2798. **Pilot –** pilot coming to you in ten minutes
2799. **OS –** yes sir one zero minutes, pilot

Example 5.46: Outbound *Mali Six*, Pilot-Ship interaction, pre boarding; Key Communication

7064. **Pilot –** *Mali six*, MahaDevi pilot
7065. **M6 –** MahaDevi pilot *Mali six*, good morning sir
7066. **Pilot –** (Disturbance cackling sounds) coming in ten minutes, start engines, heave up anchor three shackles.
7067. **SP 3 –** *Kajal twenty*, *Kajal twenty* pilot SP three
7068. **M6 –** okay sir, already engine started. We have started heaving up anchor and will switch on search light
7069. **Pilot –** yeah

The usual instructions passed during the pilot-ship pre-boarding interaction are to start engines and heave up anchor to n number of shackles (usually three). This serves to expedite operations post pilot boarding. Getting back to the communicative trajectory of outbound *MahaRishi Muni*, we next hear from pilot M 20, after he has boarded the vessel in the key communicative stage of post pilot boarding.

Example 5.47: Outbound *MahaRishi Muni*, Post Pilot Boarding; Key Communication

6556. **M 20 –** VTS, M twenty
6557. **VTS –** M twenty, VTS
→ 6558. **M 20 –** good evening, boarded *MahaRishi Muni*, two three four five. Maximum draft is six point eight metre, next port is Fujairah, PAC number alpha-one two three dated 23rd
6559. **VTS –** okay
6560. **M 20 –** I will let you know when I get underway shortly. I will be underway. I am picking up the anchor can you tell me the traffic in the channel
→ 6561. **VTS –** traffic in the channel now *Great Ship Alpha* pilot M seventeen boarding shortly passing now number one-two line, after that *NAM one two three* for dredging area, then *Tiger three*
6562. **M 20 –** *Great Ship Alpha*, M seventeen one-two line, after that which is the dredger?
6563. **VTS –** *NAM one two three*
6564. **M 20 –** *NAM one two three*, any pilot on-board?
6565. **VTS –** Pilot M fifteen
6566. **M 20 –** M fifteen, where she is now?
6567. **VTS –** She is now approaching pilot station.
6568. **M 20 –** Okay and *Tiger* is how many miles away from pilot station?
6569. (incomprehensible)
6570. **M 20 –** Okay thank you.
6571. **M 20 –** M fifteen getting underway from?
6572. **VTS –** Off from number six anchorage
6573. **M 20 –** Okay

The post pilot boarding key communicative stage of outbound vessels is an important one as hereafter the pilot takes over communication with the VTS and provides several important pieces of information for monitoring and administrative purposes. Pilot M 20, in the space of one turn (line 6558) provides the name of the vessel, the time of pilot boarding, vessel's draft, next port of call and 'port all clear' certificate number. The pilot-VTS interaction at this stage is characterised by the extended/elongated turn of the pilot that is dense and truncated with several pieces of information crammed into one turn at talk, geared towards minimising radio occupancy. The highly saturated turn at talk is intelligible to the VTS operators and the interchange is unproblematic and therefore the conversation moves forward. The field note below illustrates my reflection on the post pilot boarding interchange.

> The sheer amount of information mentioned in one turn at talk requires me to slow down to understand the import of each piece of information and its contribution to the task of the communicative management of harbour navigation. The pilot-VTS communication at this juncture comes across as a mama bird cramming the beak of its young with food. Nevertheless, neither the VTS nor the pilots have any problem with that and they quickly moved forward with the conversation. The density in VTS-pilot communication can be contrasted and compared with the VTS Seafarer interaction of the initial contact stage in which the VTS obtains information from the vessels in bite sized chunks with one question

per turn geared towards minimising confusion and miscommunication (field note, data reflection, 25 Mar 2011).

The excerpt below (5.48) is an inter–pilot interaction between M 20 outbound on *MahaRishi Muni* and M 17 inbound on *Great Ship Alpha*. The interaction starts as any other inter pilot interaction on negotiating how to pass in a meeting situation and escalates into a quarrel between two colleagues on the radio. Pilot M 20 is underway with *MahaRishi Muni* and needs to join the main channel to take the vessel on its outbound journey when he encounters pilot M 17 who tells him that he cannot enter the channel just yet.

Example 5.48: Outbound *MahaRishi Muni*, Inter Pilot interaction; Quarrel

6580. **M17 –** M twenty, M seventeen
6581. **M20 –** Joining the main channel how you want to pass?
6582. **M17 –** You'd be going from my astern. I'm going to one dock passing maybe number four line
6583. **M20 –** yeah okay you are going on the Western side of the channel?
6584. **M17 –** Present I'm on the Eastern side of the channel.
6585. **M20 –** So I have to join the channel. So we can make green to green then you can go more to port
6586. **M17 –** you won't to be able to cross my bow I am already on your port bow and going ahead
6587. **M20 –** okay then you keep clear of me. Thank you
→6588. **M17 –** No you don't enter the channel you reduce the speed, once I am clear, you can enter the channel
→6589. **M20 –** No, what is the need of your being on the Eastern side of the channel at this moment?
6590. **M17 –** Sir you want me to be there on the Western side?
6591. **M20 –** yeah that's right
→6592. **M17 –** that's absolutely wrong, incoming crafts are always on the Eastern side
6593. **M20 –** no but if you want to make it green to green with me then go on that side otherwise you slow down let me cross the channel
→6594. **M17 –** it's okay. I am continuing, you slow down, you don't come in the channel till the time this craft is clear I just boarded, she is drifted close to the ship. I am coming into the main channel in the centre now
6595. **M20 –** yeah that's what I'm saying you move to port, you can go on the Western side
→6596. **M17 –** I'm going to port at present I'm on the Eastern side. I am coming to port it takes time
→6597. **M20 –** yeah, that's the right way of answering, thank you
→6598. **M17 –** that you should have understood that thing
→6599. **M20 –** unable to understand if you don't say like this
→6600. **M17 –** my boarding time, you see how close this craft is from the number three anchored ship, so it takes time. I have to go to the port only
6601. (Recorded music plays for 8.0 seconds)

→6602. **M17 –** nothing is dead sure you remain where you are; when I am clear you can pass otherwise there is no space for you to go.

In line 6581, Pilot M 20 does not respond utilising the response format (name of caller, followed by the respondent) but immediately presents his business to enter the channel. As the interaction progresses, Pilot M 20 perceives a territorial offence committed by pilot M 17, who has perceivably encroached upon the navigation channel being claimed by M 20. Pilot M 17's stance that pilot M 20 should not enter the channel, functions as an impediment to M 20's claim (see Goffman 1971, 2010 edition). Both pilots quarrel trying to stake a claim to the channel, not wanting to give an inch, contrary to the 'role appropriate', professional conduct expected of them (see Goffman and McGinnis 1961). In line 6594 pilot M 17 gives an account and further softens his stand in line 6596. In line 6597 pilot M 20 approves and tells M 17, *'yeah, that's the right way of answering, thank you'*. It is interpreted by M 17 as an accusation implying that he had not spoken properly earlier and he ups the ante in the next line (6598), saying that pilot M 20 should have understood the situation (given his pilot experience), to which pilot M 20 retorts that he is unable to understand until properly spoken to. In line 6600, M 17 attempts to align M 20 with his understanding of the situation, *'you see how close this craft is from the number three anchored ship, so it takes time.'* Recorded music interrupts the conversation for 8 seconds and pilot 17 goes on air and broadcasts the last word in this quarrelling interchange (see Hutchby 1996a). Even though this study is not visualised in a complex social technical systems perspective (Nuutinen et al. 2007), I argue that such an inappropriate quarrel on the marine radio between two senior pilots could introduce risk into the system and is a challenge that needs to be addressed by the port authorities. The VTS would be following the quarrel, however it does not enter the conversation (quarrel) between two senior pilots at any stage. This can be seen in light of the rank differential between the pilots and the VTS operator, which will be discussed further in chapter 7 on the micropolitics of port communication. In addition to the introduction of risk into the system, the quarrel is unpalatable and does not present the pilots in a professional light to the attuned listeners that include international merchant vessels.

After some time, pilot M 20 calls the VTS and the VTS responds with an updated traffic information situation. Monitoring the traffic and providing real-time situation of the opposing traffic is a key aspect of the work of the VTS and pilot M 20 is informed of the traffic he is likely to encounter on his outbound journey.

Example 5.49: Outbound *MahaRishi Muni*; Traffic Update

6648. **M20 –** VTS, M twenty
6649. (Disturbance, distorted VHF and incomprehensible)
6650. (Recorded music plays)
6651. **VTS –** After *Tiger*, *APL Melbourne* coming pilot station zero one zero zero for Sagar port
6652. **M20 –** zero one zero zero, can you repeat the name – *Melbourne?*
6653. **VTS –** *APL Melbourne*
6654. **M20 –** repeat
6655. **VTS –** *APL Melbourne*, *APL Melbourne*
6656. **M20 –** okay *APL Melbourne* pickup, zero one zero zero after *Tiger three* right?
6657. **VTS –** that is correct.
6658. **M20 –** Thank you.

Individual enunciation of numbers, repetition and confirmatory form of talk (see Bailey et al. 2006) facilitate the uptake of the message and the read back is deployed to enable correction and seek confirmation. While pilot M 20 is piloting an outbound vessel, his next assignment, *Tiger three*, is inbound, slowly making its way to the pilot station. In the following excerpt, *Tiger three* calls the pilot and the pilot engages in the interactional practice of obtaining relevant information from the VTS prior to responding to the vessel. The pilot asks the VTS for the speed of *Tiger three* and its current location in the channel before contacting the vessel.

Example 5.50: Outbound *MahaRishi Muni*, Inbound *Tiger 3*. Pilot, VTS & *Tiger 3* interaction; Pilot Boarding Instructions; Key Communicative Act

6671. **T3 –** MahaDevi pilot, *Tiger three* calling
6672. **T3 –** MahaDevi pilot, motor vessel *Tiger three* calling
6673. **M20 –** VTS, M twenty
6674. **VTS –** M twenty, VTS
→ 6675. **M20 –** what is the speed she is doing, *Tiger three*?
6676. **VTS –** and now four knots, four point five knots
→ 6677. **M20 –** what is the location? Close to red buoy?
6678. **VTS –** Haan (Yes) correct, just approaching pilot station
6679. **M20 –** Yeah okay, *Tiger three*, pilot
6680. **T3 –** now we are at pilot position we'll wait for you
→ 6681. **M20 –** yeah I'm coming out on a tanker *MahaRishi Muni*, please pass port to port with this tanker coming out, she is off lighthouse now pass red to red and you be, remain on the minimum speed, minimum speed
6682. **T3 –** Roger I remain minimum speed
→ 6683. **M20 –** and prepare your ladder starboard side one metre from water level
6684. **T3 –** Roger now pilot ladder standby, standing, wait for you
6685. **M20 –** *Tiger three*, pilot
6686. **T3 –** yeah *Tiger three*
6687. **M20 –** *Tiger three*, pilot
6688. **T3 –** Yes station, three replying go-ahead

6689. **M20 –** yeah either you can stop engines and wait for the pilot, if you cannot steer then only use minimum engine and minimum speed because you are coming before time so please stop your engine and wait for the pilot
6690. **T3 –** Roger Roger no engine, stop and minimum speed
6691. **M20 –** if you cannot steer then use minimum engine otherwise stop your engine.
6692. **T3 –** Roger

Even though the interaction in example 5.50 (above) takes place on board an outbound vessel, it pertains to the trajectory of inbound vessel *Tiger three* and is a key communicative act as the pilot prepares the vessel for pilot boarding.

Example 5.51: Outbound *MahaRishi Muni*, Inbound *Tiger 3*. Pilot & *Tiger 3* interaction; Negotiating how to Pass and Negotiating Pilot Boarding; Key Communication

6733. **T3 –** MahaDevi pilot, motor vessel *Tiger three* calling
6734. **M20 –** yeah *Tiger*, pilot
6735. **T3 –** now I'm at pilot position and waiting to you.
6736. **M20 –** Can you see the ship on your port side?
6737. **T3 –** Uuuhhh yeah sir
6738. **M20 –** tanker coming out *MahaRishi Muni* on your port side, she will be turning to starboard and we'll pass port to port with you, red to red
6739. **T3 –** Roger red to red
6740. **M20 –** yeah I am getting down now and I come on your starboard side in the pilot launch.
6741. **T3 –** Roger

The pilot displays intention to interactionally negotiate the passing situation with the vessel and confirms that he will be getting down from *MahaRishi Muni* and boarding *Tiger three*, shortly. Thereafter we hear from the pilot after disembarking *MahaRishi Muni* (5.52).

Example 5.52: Outbound *MahaRishi Muni*, Post Pilot Disembarkation; Key Communicative Act

6754. **M20 –** VTS, M twenty
6755. **Pilot –** Anchorage mein kaunsa barge jaa raha hain Royal Gala, Royal company ka? (Translation – which barge of the Royal Gala Company is sailing in the anchorage)
6756. **VTS –** M twenty, VTS
6757. **M20 –** VTS zero zero two zero, disembarked.
6758. **VTS –** VTS zero zero two zero, okay

After disembarking the pilot, *MahaRishi Muni* has to make the remainder of its journey out of the channel. The vessel finds incoming *APL Melbourne* in its path and negotiates passing utilising intention displays (Goffman 1971, 2010 edition), personalised footing (Goffman

1981), confirmatory form of talk (Bailey et al. 2006)/ 'read back' (IMO 2002b; Froholdt, 2011) and supportive interchange (Goffman 1971, 2010 edition).

Example 5.53: Outbound *Maharishi Muni*, Inbound *APL Melbourne*; Inter-Ship Interaction; Negotiating Passing

6859. **APL Melbourne –** *MahaRishi Muni*, *MahaRishi Muni*, *APL Melbourne*
6860. **MRM –** *APL Melbourne, MahaRishi Muni*
6861. **APL Melbourne –** Sir good morning Sir, good morning. We are approaching now the fair way, we will very shortly be, we are constrained by the draft; please give us, give us some clearance
6862. **SP –** VTS, Sagar port
→6863. **MRM –** yeah *APL Melbourne* copied. I'll be altering to two seven zero after one and a half miles and we'll pass port to port
→6864. **APL Melbourne –** port to port of course and thank you and if possible give us wide berth. We are unable to alter to starboard
6865. **MRM –** Roger I will do that let me, let me come in the clear water and then I'll give you the clearance and we'll pass port to port
6866. **APL Melbourne –** Thank you for your cooperation, port to port, thank you, thank you

Outbound *MahaRishi Muni* seeks permission from the VTS to anchor outside the port limits in the designated outer Anchorage, until it receives further instructions from the company (5.54). The permission is granted and we last hear from the vessel after dropping anchor in outer Anchorage signalling the successful culmination of its outbound journey.

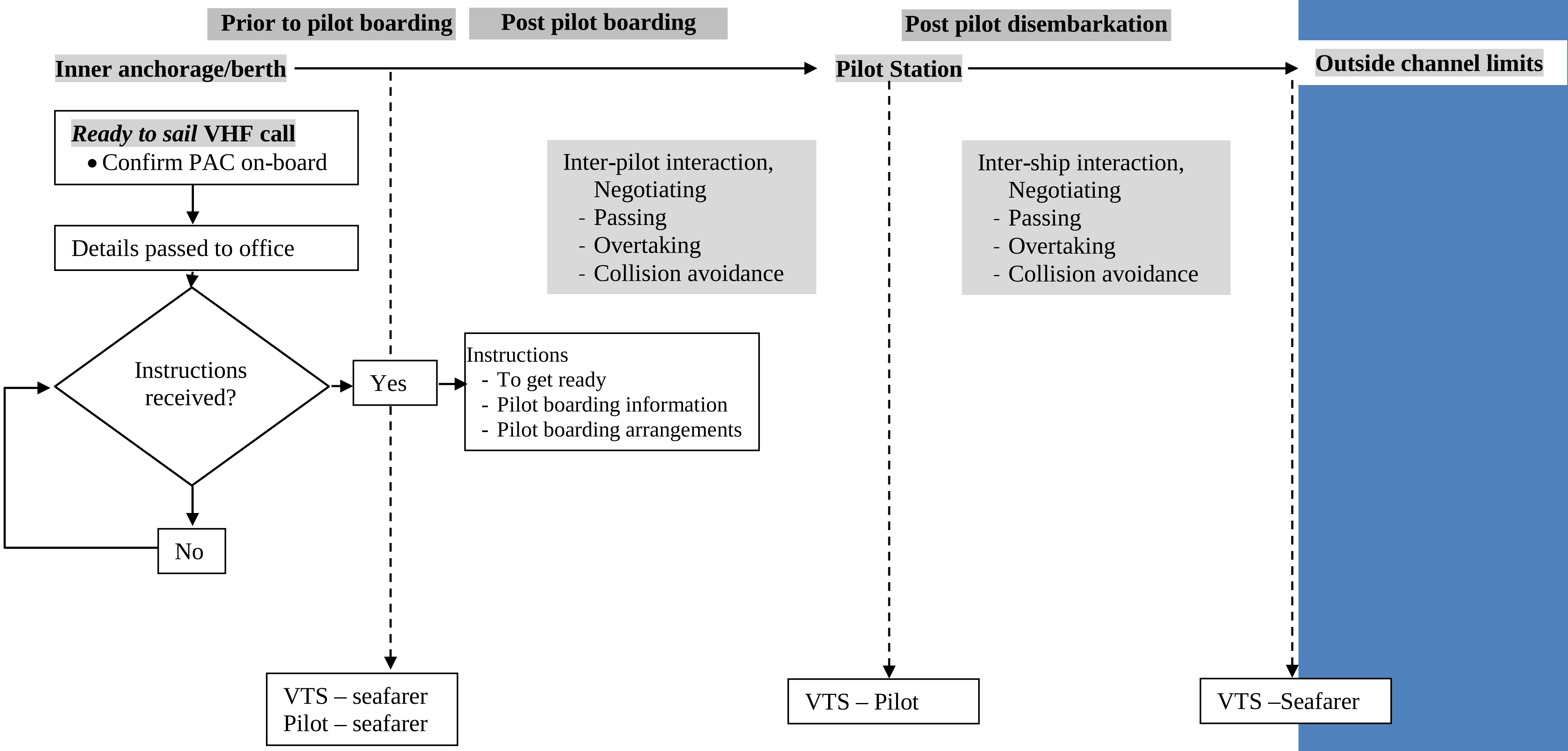
Example 5.54: Outbound *Maharishi Muni*; Seeking Permission to Anchor in Outer Anchorage

6917. **MRM –** VTMS, *MahaRishi Muni*
6918. **VTS –** *MahaRishi Muni*, VTS
→6919. **MRM –** yeah good morning sir I'm proceeding to outer anchorage, request permission to anchor in outer anchorage
6920. **VTS –** okay
6921. **MRM –** I'll be waiting there for further instructions

Three hours after the pilot disembarked, *MahaRishi Muni* (at 20 minutes past midnight), the vessel dropped anchor in the outer anchorage (0324 hours) and finished its outbound journey. Outbound vessels communicate with the VTS from their berth or anchorage position within the port prior to the pilot boarding, subsequent to which the pilot takes over communication with the VTS. Thereafter the pilot communicates with the VTS till disembarking the vessel at the pilot station. The responsible shipboard Seafarer takes over communication with the VTS for the rest of the vessel's journey out of the channel.

Figure 5. 7: Outbound MahaDevi port vessels – process, key communicative stages and participants

Source: Student



The key communicative stages in the journey of an outbound MahaDevi port vessel are – 'readiness to sail' call on the VHF, instructions from pilot prior to boarding, post pilot boarding, post pilot disembarkation at pilot station and upon exiting the channel limits.

Figure 5.7 on page 194 captures the trajectory of an outbound MahaDevi port vessel. The figure highlights the procedure and the process of managing an outbound vessel. The figure shows the key communicative stages, along with the participants engaged in the communication and the methods for accomplishing channel and harbour navigation.

After exploring the communicative management of both inbound and outbound MahaDevi port vessels, I turn to the dredgers that regularly ply in the channel.

5.4.2.iii The Communicative Management of Dredgers and the Accomplishment of Safe Navigation

Dredging is regularly undertaken to ensure that the channel is navigable at all times. Dredgers are employed to maintain channel depth to facilitate the movement of deep draft vessels including those bound for neighbouring Sagar port that use the common MahaDevi channel to journey to their berths. The trajectory of a dredger is a cyclical one (figure 5.3, page 151) – from the dredging area, past the pilot station, out of the channel to the dumping/spoil ground; thereafter dredgers re-enter the channel, sail past the pilot station and back to the dredging area to continue to dredge some more. The pilots need to know the name and location of the dredgers for their situational awareness and ask the VTS for the information as required. In the examples below (5.55, 5.56 and 5.57), pilots ask the VTS for information about the dredgers. Dredgers are common in the channel and knowledge of their position and sailing direction is important for all navigating in the channel.

Example 5.55: Pilot-VTS Interaction; Information on Dredger for Situational Awareness

378. **SP 82 –** Dredger ka naam kya hai? (transliteration) What is the name of the dredger? (translation)
379. **VTS –** *NAM one two three*

Example 5.56: Pilot-VTS Interaction; Information on Dredger for Situational Awareness

2530. **SP 82** – VTS SP eighty two, can you tell me the location of the dredgers please

Example 5.57: Pilot-VTS Interaction; Information on Dredger for Situational Awareness

973. **M 15** – VTS, M fifteen

974. **VTS** – M fifteen, VTS
975. **M 15** – VTS there is a dredger inbound, off lighthouse, who is the? What is the name of the dredger?
976. **VTS** – *Kajal* uuh (.) *Kajal twenty*
977. **M 15** – *Kajal twenty?*
978. **VTS** – that is correct

There are several dredgers working in the port and their frequency of moving in the channel is high. Pinpointing the location of the dredgers is an important part of traffic monitoring and enhances situational awareness. Of the several dredgers working in the MahaDevi channel, one such dredger is *NAM 123*. The typical trajectory of *NAM 123* and its key communicative stages are followed to explore the communicative management of dredgers in the harbour. Reproduced below are select transcript extracts from *NAM 123's* journey in the channel. In the extract below, *NAM 123* communicates with the VTS after getting underway from its anchorage position and it is on its way to the dredging area.

Example 5.58: VTS-Dredger Interaction; After Getting Underway; Key Communication

25. **NAM 123 –** MahaDevi VTS, *NAM one two three*
26. **VTS –** *NAM one two three*, VTS go-ahead
27. **NAM 123 –** Sir, good morning again, we have pilot on-board, anchor is up, we are underway, proceeding towards dredging
28. **VTS –** *NAM one two three*, there is *Asmi* outbound, keep clear and maintain channel one five
29. **NAM 123 –** Okay noted that, roger thank you
30. **VTS –** *NAM one two three*, what is the pilot boarding time?
31. **NAM 123 –** Pilot boarding time was
32. **M30 on NAM 123 –** VTS, M thirty
33. **VTS –** M thirty, VTS, good morning
34. **M30 on NAM 123 –** zero nine one zero boarded *one two three*
35. **VTS –** Okay, thank you

NAM 123 is yet to begin the day's work and in example 5.58 is making its way from its anchorage position to the dredging area. Dredging areas keep changing for the dredgers as per requirement. They could be dredging in different channel locations on different days. Dredger *NAM 123* calls the VTS after getting underway, however, the key communicative stage of post pilot boarding has been missed which the VTS makes salient in line 30 and asks the vessel for the pilot boarding time. Pilot M 30 immediately comes on air to provide the pilot boarding time as it is his responsibility to do so. The order on the port radio is essentially moral (see Garfinkel 1967, 2011 edition, 2002, 2006), with the participants taking ownership of their actions, responsibilities and accountability. Pilot M 30 had not communicated with the VTS in the post pilot boarding key communicative stage and the VTS operator makes it relevant in line 30, after which the pilot comes on air to respond. This highlights that in some instances, key communicative acts may be missed and consequently there is a delay in the communication which affects the timeliness of the information available with the VTS. Garfinkel's (2002, 2006) breaching experiments are useful in nuancing missed key communicative acts. It is when key communicative acts are missed and the VTS or another participant makes the omission salient that immediately repair work is undertaken and the act is completed, thereby revealing the underlying moral order of port VHF radio interaction.

A key communicative stage in the journey of an outbound dredger is, after finishing dredging, as it is required to communicate its intention to go out for dumping sediments in the spoil ground.

Example 5.59: After Finishing Dredging; Key Communication

294. **NAM 123 –** VTS, *NAM one two three*
295. **VTS –** *NAM one two three*, VTS
296. **NAM 123 –** Sir we have finished dredging we will be going out for dumping now
297. Okay
298. **M30 on NAM 123 –** VTS, M thirty
299. **M30 on NAM 123 –** VTS, M thirty
300. **VTS –** M thirty, VTS
301. **M30 on NAM 123 –** Kya inbound traffic hai? (Translation – What is the inbound traffic?)
302. **VTS –** inbound traffic *Great Dhami* pilot station, *Great Amba*, behind this *Dhami* and *Hudson* one one zero zero, *SCI Bangalore* for Sagar port, one zero four five and *Pratibha* one one three zero
303. **NAM 123 –** Yeah okay

After communicating its intention to go out for dumping *NAM 123* makes its way out of the channel and would be exiting the channel to go to the dumping/spoil ground when it encounters inbound dredger *Lucy 2*. Obtaining information regarding opposing traffic is utilised by pilots to stay abreast of the traffic situation.

Example 5.60: Inter-Ship Interaction; Negotiating how to Pass

509. **NAM 123 –** *Lucy two, NAM one two three*
510. **Sagar port** – VTS, Sagar port
511. **Lucy 2** – Station calling *Lucy two*
512. **NAM 123 –** *NAM one two three* coming for dumping, I will be approaching the inner red buoy, we'll make it port to port please
513. **Lucy 2 –** Roger port to port thank you very much

Dredgers usually report to the VTS while passing the pilot station in either direction. *Nam 123* did not communicate with the VTS when passing it while outbound. Even though it did not call the VTS, it was being monitored by the VTSO, who was informing other vessels in the vicinity about outbound dredger *NAM 123*.

Example 5.61: Traffic Update Provided by the VTS; Contributing to Situational Awareness

→455. **VTS –** Okay and there will be three vessel outbound one dredger *NAM one two three* and *APL Sharjah* and *Enchanting*, three vessel outbound now, over

The example below is indicative of VHF utterances made by dredgers when passing the pilot station. The indexical format (see Garfinkel 2002) of this key communicative stage in the dredger's trajectory is to provide the direction of movement along with the time when passing by the pilot station. This contributes to the monitoring function of the VTS as the dredgers inform when they are approaching the narrow critical point in the channel.

Example 5.62: Dredger *Lucy* Outbound, Passing Pilot Station; Key Communicative Stage

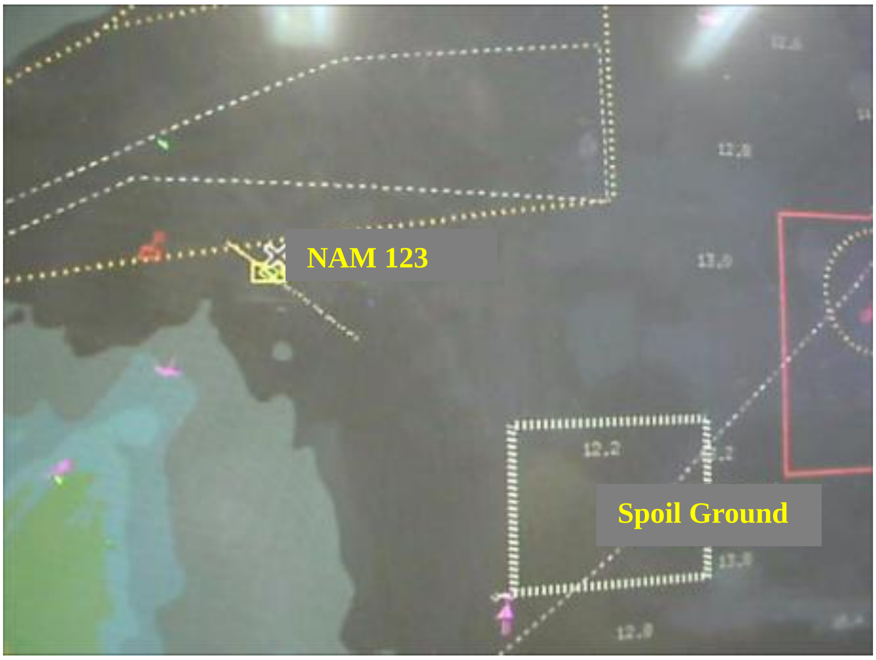
→83. **Lucy** – VTS, *Lucy*, outbound passing pilot station zero nine two five

The outbound journey of *NAM 123* finishes with exiting the channel to go to the dumping ground outside the channel limits. *NAM 123* finishes dumping and communicates with VTS before re-entering the channel.

Example 5.63: Dredger *NAM 123* Inbound, Outside Channel; Key Communicative Stage

1056. **NAM 123 –** VTS, *NAM one two three*
1057. **VTS –** *NAM one two three*, VTS
→1058. **NAM 123 –** We have finished dumping and another two minutes we shall be entering the channel, approaching outer red buoy
1059. **VTS –** Okay

Figure 5.8: ***NAM 123*** **entering the channel after dumping** (spoil ground, channel limits, the outer red buoy can also be seen in the picture) (markers by student)



Source: Student (picture taken and used with permission, suitably anonymised)

Dredgers are local port users and quite common in the channel, however, international merchant vessels are regarded in higher esteem and considered more important than local vessels like the dredgers. In the VHF conversation between pilot M 15 and M 30 (example 5.64), the former tells the latter that his *'NAM comes later on'* and that pilot M 15's work has to be done first.

Example 5.64: Dredger *NAM 123* Inbound, Inter-Pilot Interaction

1426. **M30 –** M fifteen, M thirty
1427. **M15 –** Bolo (transliteration) (translation – speak)
1428. **M30 –** Kya speed hai abhi? (transliteration) (translation – What's the speed now?)
1429. **Ship –** Sierra, Oscar, November
1430. **M30 –** Okay because I have to go to number two dock channel for dredging also
1431. **M15 –** Your *NAM* comes later on, first this has to be done, then *NAM* to follow
1432. **M30 –** Yeah I am slowing down. I will follow you only
1433. **M15 –** That is correct

Subtle undercurrents of rank, status and hierarchy are discernible on the port radio. Exploring power and asymmetry on the port radio utilising discourse analysis (see Foucault 1995a) is not the main focus of this study. However, seniority in rank, status and hierarchy is being performed and accomplished on the VHF, among others, through the use of reprimands and having the last word on the marine radio (see Hutchby 1996a). The asymmetry is further explored in chapter 7.

Dredger *NAM 123* has not communicated with the VTS while passing the pilot station, both on its outbound and inbound journeys, thereby omitting to report at the key communicative stages, which is an issue that needs to be addressed. Other dredgers such as *Lucy* and *Kajal 20* communicate with the VTS while passing the pilot station while *NAM 123* has omitted to do so. I argue that knowledge of key communicative stages supports reportage requirements and also supports the monitoring work of the VTS operators. After finishing dredging in the number two dock channel, *NAM 123* communicates with the VTS that it would be going out for dumping. In the first extract below, a Seafarer on *NAM 123* communicates with the VTS. In the second extract, the pilot on-board *NAM 123*, pilot M 30, communicates with the VTS and goes on to ask about the incoming traffic.

Example 5.65: Dredger *NAM 123* Outbound, After Finishing Dredging; Key Communication

2163. **NAM 123 –** VTS, *NAM one two three*
2164. **VTS –** *NAM one two three*, VTS, go-ahead
2165. **NAM 123 –** Sir we have finished dredging in number two dock channel, coming out, we'll be going for dumping

Example 5.66: Dredger *NAM 123* Outbound, VTS-Pilot Interaction; Traffic Update

2257. **M30 on NAM 123 –** VTS, M thirty
2258. **VTS –** M thirty, VTS, good afternoon
2259. **M30 on NAM 123 –** Good afternoon, right now I'm in number one dock channel, going out to dumping what is the traffic inbound, outbound?
2260. **VTS –** Inbound first *Hong Kong* is at inner red buoy and *Antjee*, *Antjee* is coming to pilot station one four three zero and one tug and tow waiting East of pilot station and next is one five three zero *Nanda*, *Nanda* eta pilot station one five three zero
2261. **M30 on NAM 123 –** Who is the pilot for *Hong Kong*
2262. **VTS –** *Hong Kong* will be *M twenty*

The above example shows that *NAM 123* has completed one round trip from the dredging area to the dumping ground and is preparing to go out again for the second time. A dredger could make a number of trips on any given day. Even with the pilot on-board the dredger, most of the times the shipboard seafarer communicates with the VTS, with the pilot calling the VTS to obtain traffic updates. However, in the case of international merchant vessels calling at MahaDevi port, the pilots always take on the communication with the VTS subsequent to pilot boarding. The key communicative stages of local dredgers are to be seen in conjunction with the trajectory of dredgers given in figure 5.3, page 151. The key communicative stages for local dredgers are – after finishing dredging to ask for permission to go out for dumping, when passing the pilot station (outbound), after dumping/before re-entering the channel and while passing the pilot station (inbound) before reaching the dredging area after one round trip. The exploration of key communicative stages for dredgers concludes the communicative management of MahaDevi port vessels (inbound/outbound and local dredgers) and the accomplishment of harbour and channel navigation for these vessels.

5.5 In Summary

Chapters 5 and 6 have a similar aim – to explore the communicative management and the in situ accomplishment of the safe and efficient movement of marine traffic in the harbour/channel. The point of departure being that chapter 5 focuses exclusively on MahaDevi port vessels, while chapter 6 focuses on the communicative management and accomplishment of safe traffic movement between the two neighbouring ports. Due to the similarity of the focus of the two chapters, and in order to avoid redundancy, a comprehensive conclusion section that draws upon the findings of both chapters (5 and 6) is provided at the end of chapter 6. Chapter 5 ends with a summary that discusses the role of vessel trajectories in monitoring traffic and their value in exploring members' methods, communicative practices, port procedures, processes and operations.

Chapter 5 explored the communicative management and in situ accomplishment of harbour / channel navigation utilising vessel trajectories of inbound and outbound MahaDevi port vessels as well as of local dredgers that regularly ply in the channel. I argue that there is immense value in utilising vessel trajectories to explore the in situ accomplishment of safe and efficient traffic movement, as vessel trajectories pertain to the vessels' physical journey in the channel and help to understand the entire narrative and accomplishment of the vessel's voyage. Vessel trajectories contribute to our understanding of the ship-port interface and they help to discern the associated key communicative stages, the information required at each stage, activities that need to be negotiated (pilot boarding) at select key stages, the communicating participants in the stage as well as the members' methods in accomplishing the key stages to keep the traffic flowing smoothly and efficiently without incident. Vessel trajectories also reveal the institutional procedures, processes, communicative practices and members' methods to safely and efficiently manage vessel traffic. They also provide an insight into the associated voyage timelines for managing the categories of vessels. Vessel trajectories will help ports evaluate how key communicative stages contribute to, and differ from geographic reporting points identified by the ports. Above all, vessel trajectories help explore the members' methods in the interactional accomplishment of safe traffic movement that go into the creation and maintenance of situational awareness and support the monitoring function of VTS. They can enable port facilities to evaluate the practices and procedures and assess if any communicative stage is redundant or superfluous as in the case of dredger *NAM 123* (section 5.5.2.iii) which did not communicate with the VTS while crossing the pilot station on its outbound and inbound journeys. Even though *NAM 123* did not communicate with the VTS while passing the pilot station, it was being monitored by the VTS (example 5.61, p. 198). The onus of reporting at key communicative stages is on the vessel(s), and this supports the VTS operators in their monitoring function. I argue that communicative stages should not be missed as they help VTSOs monitor the developing traffic situation which is important for safety. The key communicative stages indispensable to safety and/or record keeping are identifiable by this exercise as in the case of pilot M 30 (example 5.58, p. 196) who had not communicated with the VTS after boarding the dredger, prompting the VTSO to ask for the pilot boarding time. The inherently moral order of interaction at a key communicative stage was breached by pilot M 30 (example 5.58, p. 196), and the VTS operator, made the omission salient, held the pilot accountable, who then came on air to provide the pilot boarding tie to the VTSO, contributing to the enduring order in the port (Garfinkel 2002, 2006).

The vessel trajectories, key communicative stages, information interchanged at each juncture, activities negotiated, communicative practices and members' methods to accomplish the key communicative stages were obtained after an extensive, in-depth reflexive engagement with the data/research material. Order in the harbour was discerned by the empirical ethos of the research inspired by ethnomethodological workplace studies. The findings of chapters 5 and 6 reveal the in situ practical accomplishment of harbour/channel navigation. After exploring the accomplishment of safe and efficient traffic movement of MahaDevi port vessels, I turn to the neighbouring Sagar port and explore the achievement of coordinated traffic movement between the two ports with adjacent VTSs.

Chapter 6 A Tale of Two Ports: Two Neighbouring VTSs and the Achievement of Coordinated Traffic Movement

377. **SP 5 –** Good morning, boarded *Great Ship Dhami*, one zero two five, inbound

534. **SP 6 –** VTS, SP six, outbound on *Successful* one zero five five, MahaDevi port limit

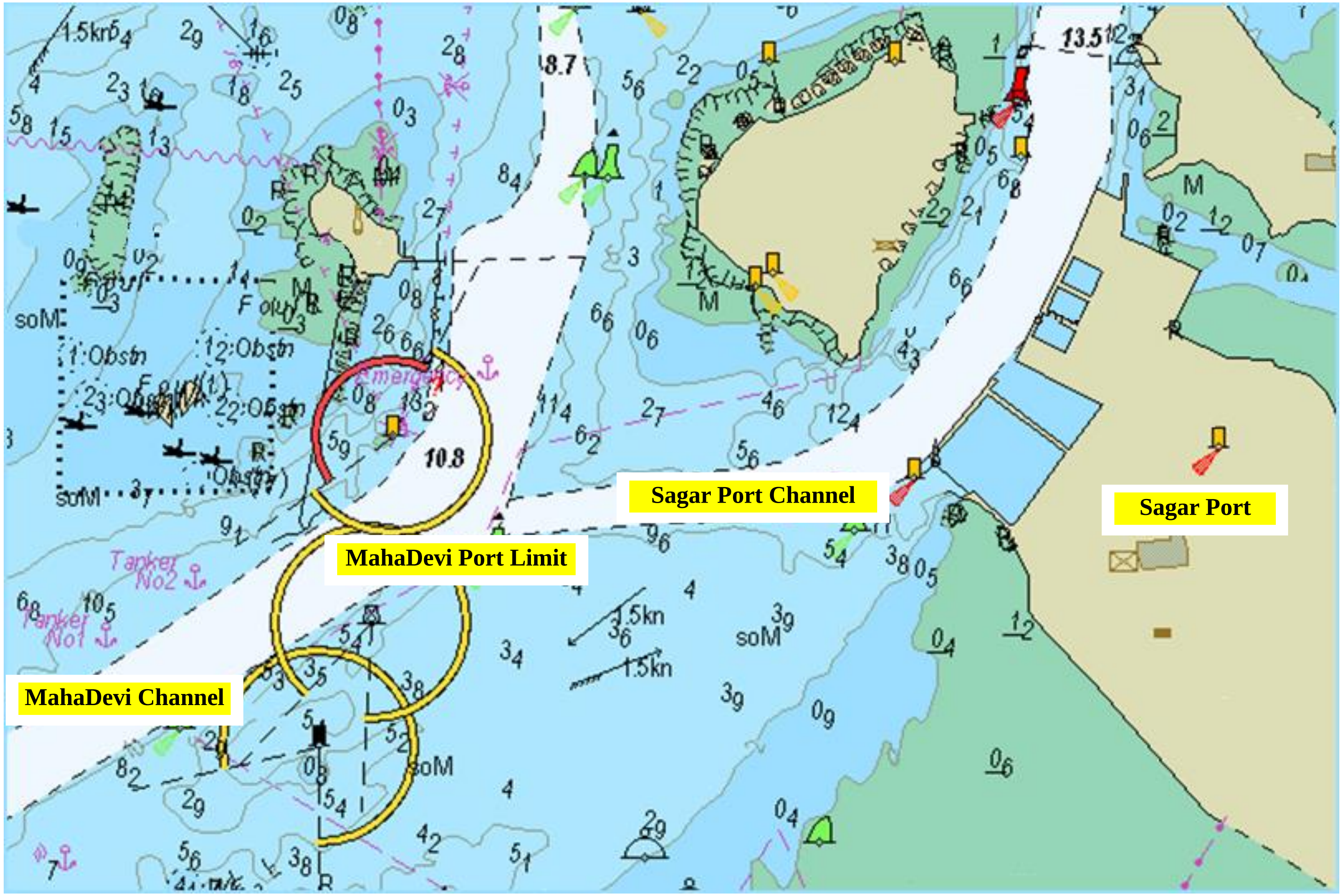
The VHF utterances mentioned above, are made by the pilots of the neighbouring Sagar port to the MahaDevi VTS, while in the common channel. Chapter 5 focused on MahaDevi port vessels, while chapter 6 explores the management of inter-port traffic and the achievement of coordinated traffic movement between two neighbouring ports.

6.1 Introduction

MahaDevi and Sagar are two neighbouring ports that have two adjacent VTSs. The two ports share the pilot station in the common channel which adds to the congestion near the pilot boarding grounds and it becomes all the more imperative to coordinate the joint movement of vessel traffic. Sagar port traffic constantly crosses into, enters and leaves the MahaDevi port limits. Coordination is required between the two VTSs to achieve safe and continuous movement of traffic. This chapter explores how inter-VTS coordination is achieved in situ. The local embedded practices differ from the prescriptive guidelines given in the IMO SMCP (2002) and are discussed in section 6.4.3 on rule following. The chapter also explores the challenges in coordinating traffic between two neighbouring VTSs. This chapter builds upon the vessel trajectories for inbound and outbound Sagar port vessels (see figure 5.2, page 151). A map of Sagar port is provided in figure 6.1 on the following page (204). Noteworthy is the point where the MahaDevi port limit ends and the Sagar port channel begins. The length of the Sagar port channel is approximately 4 nautical miles and that of the common channel is approximately 11 nautical miles. Sagar port vessels negotiate the entire length of the common channel before entering the Sagar port limits. The pilot station is located in the common channel nine nautical miles away and the Sagar port pilots negotiate this round trip of 26 nm several times a day. The VTS operators of both ports and Sagar port pilots, jointly coordinate activities to achieve safe navigation in the channel which is a local accomplishment of order (see Garfinkel, 1967). The process of coordinating traffic between the two ports begins with one call Sagar port VTS makes to MahaDevi VTS (see example 6.2, p. 205-207).

Figure 6. 1: Sagar port

Source: www.purplefinder.com (highlighted markers by student. Map anonymised)



Example 6.1: Interaction Between Two Neighbouring VTSs

5750. **SP –** VTS, VTS, Sagar port
5751. **VTS –** Sagar port, VTS.
5752. **SP –** Good evening, thoda timing note karenge? (transliteration) (translation – Can you note down the timing?)
5753. **VTS –** Do[109] minute mein call karta hun, do minute (transliteration) (translation – I will call you in two minutes, two minutes)
5754. **SP –** Okay

6.2 Giving the 'Timing'

In the example above, Sagar port wants to communicate the details of the scheduled vessel movements for its port. The MahaDevi VTS operator is busy and says that he will call in 2 minutes. After 8 minutes the MahaDevi VTS operator calls his counterpart in Sagar port, and what follows is the lengthiest exchange between the two VTSs. The practice of communicating / giving the 'timing' is the first step in coordinating traffic movements and is the lengthiest. The word ‘timing’ implies all relevant information pertaining to the vessel movement that includes the vessel name, identification of the assigned pilot and scheduled times of departure and/or arrival. Conveying the ‘timing’ requires some time for the committed exchange of information and hence the MahaDevi VTS operator promised to call again after some time (example 6.1), when he knew he could engage with Sagar port at length relatively free from interruptions. The time of this exchange is after 8 p.m. on a dark winter night and the volume of traffic is less in the harbour than it is during daylight hours. The MahaDevi VTS operator knows that a call from Sagar port usually implies giving the ‘timing’ and he makes reference to the subject of Sagar port’s previous call (example 6.2, line 5788). Sagar port answers in the affirmative in the next line and says that there are five outgoing and five incoming vessels. Sagar port needs to communicate information pertaining to ten vessel movements, and the crucial interchange begins.

Example 6.2: Giving the ‘Timing’; Key Communication

5786. **VTS –** Sagar port, VTS
5787. **SP –** VTS, Sagar port
→ 5788. **VTS –** go ahead. Is there any booking?
→ 5789. **SP –** Haan[110], yes, correct, five outgoing hai[110], five incoming

[109] ‘Do’ is not the English word which implies 'to do’; it is the transliteration for the Hindi word which refers to the number ‘two’. It is pronounced similar to the word ‘though’.
[110] ‘Haan’ is a transliteration of a Hindi word and means ‘yes’. The second transliterated word in the same line, ‘hai’ implies, ‘there are’.

5790. **VTS –** go ahead
5791. **SP –** *Puja*, off, two zero four five, pilot SP three
5792. **VTS –** okay
5793. **SP –** *Tetra Boom*, *Tetra Boom*, off, two one zero zero, SP thirteen
5794. **VTS –** okay
5795. **SP –** *U A S C*, *U A S C Qatar*, off, two two zero zero, SP eighty two
5796. **VTS –** okay
5797. **SP –** *Wisteria*, *Wisteria*, off zero zero zero five, pilot SP three
5798. **VTS –** two zero one five
5799. **SP –** zero zero zero five
5800. **VTS –** okay, SP three, okay
5801. **SP –** and *Blue Sea*, *Blue Sea*, off zero zero one five, pilot SP ninety
5802. **VTS –** *Blue*
5803. **SP –** Haan[110] *blue*, b, l, u, e (spells out the word)
5804. **VTS –** okay, zero zero one five, SP ninety
5805. **SP –** correct. Now inbound. *Jharna*, *Jharna* pickup two two one five pilot SP three
5806. **VTS –** two two one five, SP three
5807. **SP –** Correct, SP three
5808. **VTS –** one minute, one minute
5809. **SP –** And *Bhavini*, *Bhavini* pick up, two two three zero, pilot SP thirteen
5810. **VTS –** *Bhavini*, what's the time?
5811. **SP –** two two three zero
5812. **VTS –** two two three zero, SP?
5813. **SP –** SP thirteen, one three
5814. **VTS –** Okay
5815. **SP –** and *Heyday*, *Heyday*, pick up two three one five pilot SP eighty two
5816. **VTS –** *Heyday*?
5817. **SP –** Correct
5818. **SP –** Hotel Echo Yankee Delta Alpha Yankee.
5819. **VTS –** Roger
5820. **SP –** pilot SP eighty two.
5821. **VTS –** Okay
5822. **SP –** And *Crimean*, *Crimean*, pickup zero one, zero one, before that, *Moon jewellery*, *Moon jewellery*.
5823. **VTS –** Okay
5824. **SP –** pickup zero one three five, pilot SP three
5825. disturbance
5826. **VTS –** SP three *Moon jewellery*, okay
5827. **SP –** correction first word is *Meena*, *Meena Jewellery*, *Meena*
5828. **VTS –** *Meena*?
5829. **SP –** Haan[110] *Meena Jewellery* pickup zero one three five
5830. **VTS –** okay
5831. **SP –** and *Crimean*, *Crimean*, pickup zero one four five, zero one four five SP ninety
5832. **VTS –** SP ninety, correct?
5833. **SP –** Correct, zero one four five, pickup
5834. **VTS –** Okay, toh abhi apni taraf se yeh *Tiger three* pilot station bulaya hai, zero zero one five for one Dock (Translation – from our side, *Tiger three* has been called to the pilot station)

5835. **SP –** vessel's name sir?
5836. **VTS –** *Tiger three, M twenty*, Tiger, India, Golf, Echo, Romeo, three, *Tiger three*, number three, zero zero one five, for one Dock and *Moon Star*, usko pilot station bulaya hai zero two zero zero, over (Translation – has been called)
5837. **SP –** Second wala sir. (Translation – the second one)
5838. **VTS –** *Moon Star*
5839. **SP –** *Moon Star* zero, zero (.) zero two zero zero
5840. **VTS –** For, berth three
5841. **SP –** berth three, that's all?
5842. **VTS –** Yeah
5843. **SP –** Okay

The first key communicative act in the coordination of traffic movement between the two neighbouring VTS sectors is giving the 'timing' information as in example 6.2. Taking the time to commit and engage in a lengthy interaction with the neighbouring VTS, is utilised by the VTS operator to ensure the success of the communication. The interaction from start to finish took nearly 4 minutes and is remarkable in the sense that it was free from interruptions. This can be explained by the fact that the volume of traffic for MahaDevi port had reduced for the night. While traffic had reduced for one port, the other – Sagar port was active as it was taking advantage of the favourable high tide. Sagar port accommodates deep draft vessels and is particularly active during the high tidal window, whenever it may occur during night or day. This accounts for the almost consistent and continuous movement of traffic for MahaDevi port during the course of the day and the movement in tidal bursts for its neighbour. The VTS operators use indexical practices in institutional interaction (see Garfinkel 2002). They enunciate individual digits of numbers, use the radio alphabet to spell out unfamiliar words (usually proper nouns, for example vessel names), exhibit the reformulated 'confirmatory form of talk' (see Bailey et al. 2006) and utilise the 'read back' to enable correction (see Froholdt, 2011). Even though the 'timing' interaction has a predictable standard structure, the MahaDevi VTS operator who is jotting down all of this information while listening to it at the same time needs the Sagar port VTS operator to slow down and says, *'one minute, one minute'* (line 5808). The inherent structure of the 'timing' interchange is noteworthy. The information on vessel movements is provided in increasing time order and the details of all outbound vessels are provided first, followed by the details of the inbound vessels. The VTS operator of Sagar port makes it clear that hereafter he will provide the details of inbound vessels in line 5805 of example 6.2 replicated below. The Sagar port VTS operator uses the word 'pickup' to refer to the pilot boarding time of inbound vessels.

→5805. **SP** – correct. Now inbound. *Jharna*, *Jharna*, pickup, two two one five, pilot SP three

The word, 'off' is used to refer to the departure time of outbound vessels. All utterances that provide vessel information have a recognisable standard structure; the vessel name is mentioned first, followed by the trajectory depicted by the word 'off' for outbound, 'pickup' for inbound, followed by the scheduled time, followed by the designated pilot.

→ 5793. **SP** – *Tetra Boom*, *Tetra Boom*, off, two one zero zero, SP thirteen

The 'timing' exchange of example 6.2 is summarised in table 6.1 below.

Table 6. 1: Giving the 'timing'; summary of interaction in example 6.2

S. no.	Name of the vessel	Inbound/outbound	Time	Pilot
1	*Puja*	↑ Outbound	2045	SP 3
2	*Tetra boom*	↑ Outbound	2100	SP 13
3	*UASC Qatar*	↑ Outbound	2200	SP 82
4	*Wisteria*	↑ Outbound	0005	SP 3
5	*Blue sea*	↑ Outbound	0015	SP 90
6	*Jharna*	Inbound ↓	2215	SP 3
7	*Bhavini*	Inbound ↓	2230	SP 13
8	*HeyDay*	Inbound ↓	2315	SP 82
9	*Meena Jewellery*	Inbound ↓	0135	SP 3
10	*Crimean*	Inbound ↓	0145	SP 90

Sagar port pilots take assigned vessels out and bring different assigned vessels in to complete one cycle of the pilotage assignment and the structure of the VTS interaction follows this pattern and provides information of outgoing vessels before providing the details of incoming vessels. To explore the traffic movement between two adjacent VTSs, I follow two Sagar port pilots, number 3 and 13, on their respective outbound and inbound voyages. I follow four vessel movements of these pilots, of which two are outbound and two inbound. It takes approximately one and a half hours one way and three hours in total to complete one cycle of outbound and inbound pilotage.

In continuation with the theme of dramaturgy (see Goffman 1959), the 'timing' interchange introduces the key protagonists, informs the other (MahaDevi) VTS and all bystanders of the expected route protagonists will take and at what time. According to their scheduled time, on cue, the protagonists begin to make their appearance one by one in the channel and on the port

VHF radio[111]. Fifteen minutes after the reported departure time of 2045 from its berth, outbound vessel *Puja* with pilot SP 3 on-board crosses into the MahaDevi port limit at 2100 hours in example 6.3. Section 6.3 covers the complete pilotage cycles of Sagar port pilots.

6.3 Sagar Port Pilots and Pilotage Cycles

6.3.1 Pilot SP 3, a Complete Pilotage Cycle; O/b on *Puja* and I/b on *Jharna*

Example 6.3: Pilot SP 3, Outbound on *Puja*, Crossing MahaDevi Port Limit; Key Communicative Act

5849. **SP 3 –** VTS, SP three
5850. **VTS –** SP three, VTS
→ 5851. **SP 3** – boarded *Puja*, passing MPL two one one zero
5852. **VTS** – °okay° (softly spoken)
5853. **SP 3** – ↑SP three
5854. **VTS** – go-ahead SP three, go-ahead
→ 5855. **SP 3** – outbound with *Puja*, passing MPL two one one zero
5856. **VTS** – okay, okay, copied, *NAM one two three* inbound, now passing number four line
5857. **SP 3** – Who is the pilot?
5858. **VTS** – It is number four line, coming to dredging area

A key communicative stage of outbound Sagar port vessels is reporting at the MahaDevi port limits, so the VTS operators of MahaDevi are aware of Sagar port traffic entering the common channel and can inform other vessels accordingly. The key information required to be passed at this juncture comprises the vessel name and the time of crossing and entering the MahaDevi port limits (MPL). This announces the arrival of a new target vessel to be monitored by the MahaDevi port VTS operators. In the example above, pilot SP 3 is not sure that the VTS operator has heard his message (line 5852) and announces his continued presence on the radio by saying ‘SP 3’ (line 5853) in rising intonation; that can be understood as making the lack of confirmation by the VTSO, hearable and hold him accountable to acknowledge the communication. The pilot repeats his message again (line 5855) and the VTS operator suitably

[111] A point to note here is that my access to the communicative trajectory of Sagar port vessels is limited to the access the MahaDevi port VTS operators have of their neighbours. I have analysed the interaction on MahaDevi port VHF channel 15 and not the Sagar port channel number 17. Even though outbound Sagar port vessels would have commenced communication with its VTS when inside its port limits, I am able to follow them once they make their appearance at the MahaDevi port limit. The same goes for inbound Sagar port vessels: I can follow them once they announce their arrival and enter the MahaDevi port limits, and lose them after the pilot station.

responds with the information pertaining to the current inbound traffic that pilot SP 3 is likely to encounter on his outward journey. Providing information on the opposing traffic situation by painting word pictures is discussed separately, under the communication strategies of VTS operators (section 6.4.2). Pilot SP 3 wants to know the name of the pilot on *NAM 123*, however he gets a response informing him of the location and the destination of the dredger. The response is unsuitable but unproblematic for pilot SP 3, who continues on his voyage without asking any further questions. We next hear from pilot SP 3 after one hour and five minutes upon disembarking outbound vessel *Puja* in the key communicative stage of post pilot disembarkation (example 6.4). This signals to the VTS operator that the outbound vessel is without a pilot and is making its way out of the channel. Key pieces of information required at this juncture are the identity of the pilot, the action verb of ‘disembarked’, the name of the vessel and the time of disembarkation.

Example 6.4: Pilot SP 3, Outbound on *Puja*, Post Disembarkation; Key Communicative Act

6004. **SP 3** – VTS, SP three
6005. **VTS** – SP three, VTS
6006. **SP 3 –** VTS, SP three disembarked from *Puja*, two two zero five
6007. **VTS** – okay copied

Pilot SP 3 did not encounter any traffic in the channel and he only communicated with the MahaDevi VTS at two key communicative stages – entry into the port limits, and after disembarkation. His second pilotage assignment for an inbound vessel *Jharna* will take him back to Sagar port and complete one round trip.

While Sagar port pilots are outbound on their respective vessels, the vessels they are scheduled to bring in begin to arrive at the pilot station. Departures and arrivals are closely coordinated to minimise the time the pilot is at the pilot boarding grounds to reduce congestion in the critical part of the channel. The pilot disembarks an outbound vessel and shortly after, boards the incoming vessel. The coordination of traffic is first achieved on paper in the office and thereafter interactionally on the VHF to support the physical accomplishment of navigation in the harbour/fairway.

Example 6.5: Arrival of incoming traffic for Sagar port

6029. **Kajal 20 –** Sir any outbound, inbound traffic Sir?

→ 6030. **VTS –** okay inbound traffic is there, first is crew boat *Jharna* coming pilot station two two one five for Sagar port, *Bhavini* coming pilot station two two three zero, she is also for Sagar port after that, *Heyday*, *Heyday* coming pilot station two three one five for Sagar port, confirm, copy?
6031. **Kajal 20 –** copied Sir

Provision of the latest traffic situation and movement schedule is a key broadcast on the VHF radio. It serves to contribute to the situational awareness of all listeners and is especially relevant to the traffic in the channel. The provision of updated traffic pictures is discussed in section 6.4.2 on communicative strategies of VTS operators. The use of the word ‘confirm’ and ‘copy’ to confirm receipt of message is also discussed in this section. The example below pertains to the one and only key communicative stage of an inbound Sagar port vessel. Pilot SP 3, Post embarkation, calls the VTS and passes on the required information, direction (inbound), name of the vessel followed by boarding time.

Example 6.6: Pilot SP 3, Inbound on *Jharna*, Post Embarkation; Key Communicative Act
6104. **SP 3 –** VTS, SP three
6105. **VTS –** SP three, VTS
→ 6106. **SP 3 –** inbound with *Jharna* boarded two two three zero
→ 6107. **VTS –** okay copied. Dredger this, you are already passing *NAM 123*, *Kajal twenty* outbound, pilot M four on-board
6108. (3.0) (no response)
→ 6109. **VTS –** *Jharna*, VTS
6110. **Jharna –**VTS, *Jharna* good evening sir.
→ 6111. **VTS –** Okay *Kajal twenty* outbound, pilot M four on-board
→ 6112. **Jharna –** okay sir, *Kajal twenty*, M four, okay, thanks

A ‘non-response’ and the ensuing silence is heard and made salient (see Sacks 1989). In the example above (6.6), the VTS operator provides the traffic information to pilot SP 3 and when the latter does not respond (line 6108), the VTS operator calls the vessel and repeats the required traffic information. The order is inherently moral and the communication loop needs to be closed with a confirmation / acknowledgement. Upon not receiving any response from the designated on-board pilot, the VTSO contacts *Jharna* to communicate information regarding the opposing traffic the vessel would encounter. Inbound Sagar port vessels have only one key communicative stage – post pilot embarkation thereafter they disappear from the audio track unless the vessel encounters traffic and engages in communication with other ships to negotiate collision avoidance. The recovery of the trajectory of an inbound Sagar port vessel is discussed in section 6.3.2. The second Sagar port pilot I follow on his round trip is SP 13.

6.3.2 Pilot SP 13, a Complete Pilotage Cycle; O/b on *Tetra Boom and* I/b on *Bhavini*

Example 6.7: Pilot SP 13, O/b on *Tetra Boom* Crossing MahaDevi Port Limit; Key Communicative Act

→5897. **SP 13** – VTS, SP thirteen outbound on container ship *Tetra Boom* at MPL two one three zero draft ten point eight metres
5898. **VTS** – okay, copied

As customary, the pilot makes a call at the first key communicative stage when crossing into the MahaDevi port limits with the required information – pilot identification, route direction 'outbound', name of the vessel and the time of crossing into the MahaDevi port limits. One extra and key piece of information the pilot includes is the draft of the vessel. The draft of 10.8 m signals a deep draft vessel, restricted in manoeuvrability. This information communicates to the listeners, particularly vessels in the fairway to keep clear

After 45 minutes, pilot SP 13 makes a quick call to the VTS upon disembarking *Tetra Boom* and completes the second key communicative stage in the outbound vessel's journey. What is noteworthy in the example below (6.8) is that the pilot leaves out the name of the disembarked vessel. While it is true that the VTS operators are in possession of all information pertaining to vessel movements and would therefore know pilot SP 13 has disembarked from *Tetra Boom*, it would have been useful to include the vessel name in this instance as there are several attuned bystanders who would benefit from the information.

Example 6.8: Pilot SP 13, Outbound on *Tetra Boom*; Post Disembarkation, Key Communicative Act

6023. **SP 13 –** VTS, SP thirteen, two two one five, disembarked

Within five minutes of disembarking outbound *Tetra Boom*, the pilot boards his next assignment, the inbound *Bhavini*. The VTS operator, as he is wont to, provides information on the latest traffic situation in the channel. The VTMS operator informs pilot SP 13 of the two outbound dredgers he is likely to encounter while on his inbound journey.

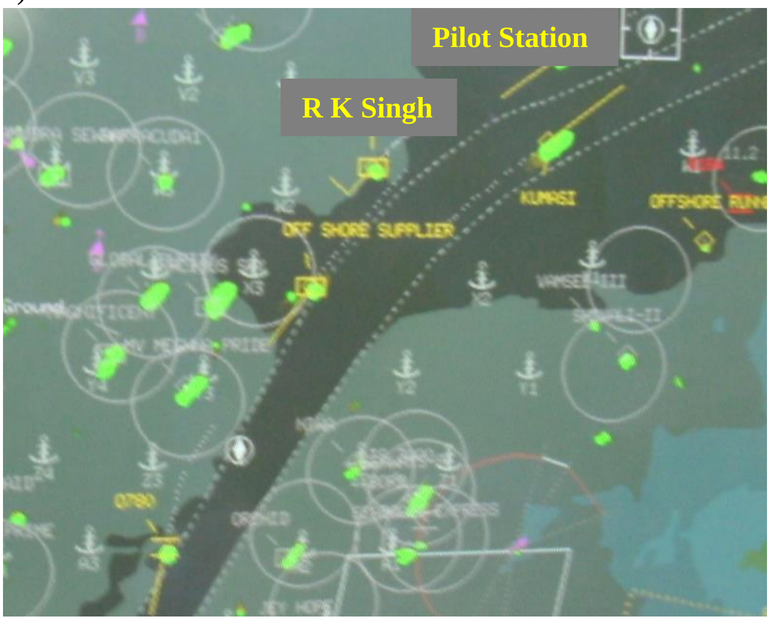
Example 6.9: Pilot SP 13, Inbound on *Bhavini*, Post Embarkation; Key Communicative Act

→6054. **SP 13** – Control SP thirteen, boarded *Bhavini*, inbound two two two zero
6055. **VTS** – SP thirteen, *Bhavini* two two two zero
6056. **SP 13** – two two two zero

6057. **VTS** – outbound *NAM one two three* and *Kajal twenty*, dredger, outbound.
6058. **SP 13** – Two outbound okay, dredger and other one *NAM*?
6059. **VTS** – other dredger is *Kajal twenty*, first dredger *NAM one two three*
6060. **SP 13** – *NAM one two three*, okay

Inbound Sagar port vessels have only one key communicative stage – post embarkation at the pilot boarding grounds and the key stage for pilot SP 13 is now complete. I believe that it is insufficient to have just one key communicative stage for inbound Sagar port vessels as after passing the pilot station they still have to journey the nine nautical miles of the common channel before they can enter the Sagar port limits. I argue that just as the Sagar port pilots report when entering into MahaDevi port limits, they should call when exiting the MahaDevi port limits. If the inbound Sagar port vessel encounters no traffic and/or does not engage in inter-ship communication, then the communicative trajectory of a vessel is lost on the audio recording and the phenomenon has to be recovered through alternative research data (see recovery of phenomenon in metronome experiment, Garfinkel 2002). To illustrate the recovery of phenomenon, I take the example of *RK Singh* and briefly digress from following pilot SP 13 on *Bhavini*. The pictures of *RK Singh* depict the progress of the vessel up the common channel, on exiting the MahaDevi port limits and entering deep into Sagar port.

Figure 6. 2: RK Singh, inbound; past the pilot station, moving up the channel
(markers by student)



Source: Student (picture taken and used with permission)

Figure 6. 3: RK Singh, inbound; further up the channel
(marker by student)

Source: Student (picture taken and used with permission)

Figure 6. 4: RK Singh, inbound; exiting MahaDevi port limits and entering Sagar port
(marker by student)

Source: Student (picture taken and used with permission)

Figure 6. 5: RK Singh, inbound; deep inside Sagar port
(marker by student)

Source: Student (picture taken and used with permission)

The only key communicative stage of an inbound Sagar port vessel occurs at the pilot station and thereafter the communicative trajectory of the vessel can then be lost in the audio recording as the vessel has already undertaken the required communication and may not undertake any further. I utilised the example of *RK Singh* to highlight that the phenomenon of the physical journey of the inbound Sagar port vessel up the channel can be followed by alternative data sources like pictures of the vessel's progress up the channel.

I now return to pilot SP 13, who is on his return inbound journey on-board *Bhavini*. The pilot encounters traffic on his way and, in addition to communication at the communicative stage of post pilot boarding, engages in inter-ship interaction to display intention and negotiate how to pass (Goffman 1971, 2010 edition; Bailey et al. 2006).

Example 6.10: SP 13-VTS and SP 13-*Kajal 20*
6065. **SP 13** – VTS, SP thirteen
6066. **VTS** – SP thirteen, VTS
6067. **SP 13** – which is the second vessel outbound? I am just now passing one dredger
6068. **VTS** – second dredger, *Kajal twenty*
6069. **Bhavini** – *Kajal twenty*, this is *Bhavini*.
6070. **Kajal 20** – Who is calling?
6071. **Unknown** – one four, one four
6072. **Kajal 20** – *Bhavini*, *Kajal twenty*

6073. **Bhavini** – *Kajal twenty*, this is *Bhavini* I am passing the first dredger outbound so what is your intention?
6074. **Kajal 20** – okay Sir port to port with you.
6075. **SP 13** – Yeah then you go more to your starboard please
6076. **Kajal 20** – okay sir more to starboard.

A common format of initiating inter ship interaction is to first check with the VTS and then follow up with the identified entity. In the example above, pilot SP 13 first asks the VTS to identify the second outbound dredger and then initiates the follow-up interaction with *Kajal 20*. This interactional practice is explored in section 6.4.2 on communicative strategies.

In the example below, pilot SP 13 has an awkward interaction with pilot MP 15 on-board *Kajal 20*. Pilot MP 15 comes across as irritated. Pilot MP 15 believes that pilot SP 13 asked *Kajal 20* to go more to starboard without sighting and verifying the target first. The repeated questioning by MP 15, *'have you sighted her?'* is sarcastic and points to an alleged omission by pilot SP 13 of not verifying the target first.

Example 6.11: SP 13-MP 15; Inter-Pilot Interaction

6062. **MP 15** – SP thirteen, MP fifteen
6087. **SP 13** – MP fifteen, SP thirteen
→ 6088. **MP 15 –** have you sighted this *Kajal twenty*? You are asking her to go to starboard. Have you sighted her?
6089. **SP 13 –** No, not yet. You are on which one?
→ 6090. **MP 15 –** I am on *Kajal twenty*, I heard you telling *Kajal twenty* to go to starboard but have you sighted her?
→ 6091. **SP 13** – that's another ship that means, okay, yeah you are on *Kajal twenty*, you are still inside, is it?

Pilot SP 13's response (line 6091, example 6.11) implies that he confused another ship for *Kajal 20* and that there could be another vessel in the vicinity unknown to the VTS whose information may not be available via the AIS. Non-participation of vessels in the VTS area has been identified as a problem for VTS operators (see Praetorius 2012). Pilot SP 13 had obtained the name of the second outbound dredger (*Kajal 20*) from the VTS (Example 6.9, p. 212-213) and had accordingly called the vessel. Pilot MP 15's response made apparent his irritation that someone asked his vessel to move to starboard, without sighting and adequately confirming the target first. Pilot M 15 did not respond to pilot SP 13's remedial utterance (line 6091). Hutchby (1996a) explored asymmetry on the radio and the power of the last word. I believe that choosing not to respond to the remedial overtures (see Goffman 1971, 2010 edition) by a colleague is an equally effective snub and pilot SP 13's attempt at remedial interaction remains unanswered (example 6.11, line 6091). There are instances of inter pilot communication which come across as a verbal spat, quarrel or disagreement in the transcript which signify floating egos in the harbour. The VTS does not intervene in such instances where senior pilots are talking, and quarrels on the VHF radio could raise questions regarding professionalism in the port. The pilots perform and accomplish their higher high rank and status in the port and this is discussed in chapter 7 on the micropolitics of port communication.

Of the timing list provided before 8 p.m. (example 6.2, p. 205-207), the last of the Sagar port pilots has not even made his way out when the Sagar port VTS calls again with another list of scheduled timings and the cycle continues.

Example 6.12: Giving the Timing; Key Communication

6092. **SP** – VTS Sagar port
6093. (12.0)
6094. **VTS** – Sagar port, VTS
6095. **SP** – Roger sir, timing bolun? (Translation – shall I give the timing?)
6096. **VTS** – Bolo kitna hai? (Translation – Tell me how many are there?)
6097. **SP** – Karib karib nau hain (Translation – Almost nine are there)
6098. **VTS** – Haan boliye (Translation – Yes, speak)

Sections 6.3A and 6.3B have explored the procedures, processes and the emic, in situ, local embedded situated artful practical accomplishment (see Garfinkel 1967, 2011 edition, 2002, 2006) of the management and coordination of traffic between two neighbouring VTSs/ports. Sections 6.3A and 6.3B have explored the institutional talk that accomplishes work for the port. The following section (6.4) discusses some of the key findings which require separate elucidation as they could not be fully covered in the exploration of trajectories; but before that, I summarise the language use and institutional interaction of the main communicating groups on the port radio in figure 6.6 on page 218 which is applicable to both chapters 5 and 6. The figure depicts the interaction between the social actors in 5 possible combinations. It shows the key communicative stages when the communication between groups occurs. The language use between the different groups is also summarised, along with the key information exchanged and/or instructions provided at the different stages. Figure 6.6 can be regarded as a graphical summary of institutional interaction in the harbour/channel presented in chapters 5 and 6.

Figure 6. 6: Communicating groups & VHF communication
Source: Student

VTS - VTS

Key stage – Giving the 'Timing'

Language use

- Highly structured
- Standard
- Predictable
- Long sentences
- Dense, truncated, action saturated utterances
- Interaction between colleagues
- At times can be colloquial & conversational
- Can be vernacular

Key Information/ instructions

- Scheduled traffic
- Name of ship
- Time of departure or
- Time of arrival
- Name of pilot

Pilot - Pilot

Key stage – Between Pilot station & berthing/ anchoring

Language use

- Interaction between colleagues
- Long sentences
- At times colloquial & conversational
- Can be vernacular

Key Information/ instructions

- Traffic movement in the vicinity
- Vessel speed & location in the channel
- Regarding how to pass / overtake / avoid collision in the channel

VTS - Pilots

Key stage – Pilot station
Key stage – Berthing/ anchoring
Key stage – Entering MPL

Language use

- Brief, precise & effortless
- Standard, predictable & short sentences
- Structured interaction
- Dense, truncated, action saturated utterances

Key Information/ instructions

- Vessel name & draft
- Pilot boarding/ anchoring/ disembarking time
- Traffic in the vicinity
- Direction of movement

Pilots - Seafarers

Key stage – Pilot station

Language use

- Standard
- Predictable
- Short sentences
- Structured interaction
- At times colloquial & conversational

Key Information/ instructions

- Pilot boarding arrangements
- Pilot boarding speed
- Switching VHF channels

VTS - Seafarers

Key stage – Initial contact

Key stage – Reporting line

Key stage – Pilot station

Key stage – Readiness to sail

Language use

- Standard
- Predictable
- Short sentences
- Structured interaction
- SMCP used in initial contact
- Loosely structured upon encountering non-standard requests

Key Information/ instructions

- Approximately 8 questions in the Initial contact
- Instructions to anchor vessel in designated anchorage
- Instructions to get underway and arrive at the pilot station
- Instructions to report to VTS as instructed
- Obtaining readiness to sail and confirming PAC on-board

6.4 Key Themes and Findings

This section explores the key themes and findings that have a bearing on the communicative management of vessel traffic in the harbour. These themes may not immediately be evident when exploring traffic management from the perspective of vessel trajectories, and when evident, could not be explored in depth while exploring the vessel trajectories. The key themes identified during the course of chapters 5 and 6 are brought together and discussed in this section, as the theme of monitoring appropriate VHF radio channels, which was not evident elsewhere in the chapter but is vital from a safety point of view. Recourse to different techniques of data generation in my ethnographic study (chapter 3) helped me to build a nuanced picture of traffic management/coordination and interactional achievement of navigation in the port. Themes which were not accessible via one technique were brought into view by another.

6.4.1 'Which Channel are You?'

The theme of the VHF radio channel a Sagar port ship should maintain while in the common MahaDevi channel, was not immediately evident in section 6.3 on the communicative management of traffic between the two neighbouring VTSs, as I had followed expert Sagar port pilots on their round trip who demonstrated an awareness of appropriate communicative procedures. Analysing the VHF interaction of Sagar port vessels without a pilot on-board reveals a channel issue pertaining to the VHF radio channel the vessel is monitoring/or supposed to monitor while in the common MahaDevi navigation channel.

Example 6.13: MahaDevi VTS-Sagar Port Vessel; Key Communicative Act (anomaly)

303. **LE –** VTS, *Lunar Eclipse*
304. **VTS –** yes, go-ahead
305. **LE –** yeah good morning sir, this is *Lunar Eclipse*
306. **VTS –** go-ahead
307. **LE –** Sir thing is that we received confirmation from Sagar port, that arrive pilot station at one one zero zero hours sir
308. **VTS –** you please call Sagar port, then why is she calling MahaDevi VTS? Over
309. **LE –** Negative Sir we didn't call the MahaDevi VTS, we only call that Sagar port on one seven only
310. **VTS –** But now which channel are you?
311. **LE –** Yeah but we are just informing you, because that as per that, Sagar port, they said we have to inform VTMS also that we are crossing the channel
312. **VTS –** yeah ↑okay, ↑okay, Sagar port will give you the traffic and you can speak to the Sagar port (spoken positively)
313. **LE –** thank you so much sir so we can continue, na? (Translation – no)
314. **VTS –** Yeah speak with the Sagar port for all the instructions
315. **LE –** Yeah thank you so much sir, back to one seven

In example 6.13, a Sagar port vessel, *Lunar Eclipse*, is supposed to arrive at pilot station at 1100 hours and accordingly calls the *MahaDevi* VTS as it has to journey through the common channel to reach the pilot station. A Sagar port vessel is required to maintain channel 17 (Sagar port working channel) as well as channel 15 (MahaDevi port working channel) when sailing in the common fairway. *Lunar Eclipse* gets an unhelpful response from the MahaDevi VTS operator (line 308), who appears irritated as to why a Sagar port vessel has called MahaDevi VTS instead of Sagar port VTS. This pushes the Seafarer on-board *Lunar Eclipse* on the back foot and he justifies that he had first called Sagar port on VHF channel 17. The VTS operator counters this with a sarcastic rhetorical question (line 310) *'But now, which channel are you?'* a dis-preferred response (see Schegloff 2007) to drive home the point that the seafarer is not on Sagar port VTS channel number 17 but rather on the MahaDevi VTS VHF channel number 15. In line 311 the seafarer justifies that according to Sagar port VTS, the vessel was required to inform MahaDevi VTS when crossing the common channel. On hearing this, the VTS operator engages in repair and remedial work (see Goffman 1971, 2010 edition); speaks positively and says 'okay' twice to show agreement with the seafarer on-board *Lunar Eclipse*. Noteworthy is line 315, in which the seafarer tells the VTS operator, *'back to one seven'* implying that he is changing the VHF radio channel back to 17 but the vessel is entering the MahaDevi port which works on channel 15. The situational awareness of a Sagar port vessel will be severely impacted if it sails in the MahaDevi waters while tuned on channel 17 (Sagar port channel) as the MahaDevi VTS operates on a different VHF channel – 15. I argue that reprimanding a seafarer (example 6.14, line 308) and being sarcastic about the channel he is communicating on, has the potential to introduce risk in a complex socio-technical system (Nuutinen et al. 2007). One reason for the VTS operators' unhelpful response in line 308 is because the seafarer on-board *Lunar Eclipse* did not frame (see Goffman 1974 (1986 edition)) his utterance in coherence with the key communicative stage of reporting when due to enter channel limits. The Seafarer on-board *Lunar Eclipse* began with an account (line 307) that he had been informed by Sagar port to reach the pilot station at 1100 hours and did not frame his utterance in the familiar 'reporting after getting underway' structure. Below are two examples of inbound Sagar port vessels communicating at the key communicative stage of reporting intention before entering the channel limits; the same format was not followed by *Lunar Eclipse*.

Example 6.14: MahaDevi VTS-Sagar Port Vessel; Key Communicative Act

8661. **T5 –** VTS, VTS, *Tag five*

8662. **VTS –** *Tag five*, VTS, good morning

8663. **T5 –** good morning, sir my anchor away. I am underway to Sagar port sir
8664. **VTS –** Okay

Example 6.15: MahaDevi VTS-Sagar Port Vessel; Key Communicative Act
114. **SCI Chennai –** MahaDevi VTS, MahaDevi VTS, *SCI Chennai*
115. **VTS –** *SCI Chennai*, VTS good morning, go-ahead
116. **SCI Chennai –** good morning sir we picked up anchor from [omitted] and now are heading for pilotage at one zero four five
117. **VTS –** okay destination port Sagar port, correct?
118. **SCI Chennai –** that's correct, sir
119. **VTS –** okay, thank you

The VHF channel issue is particularly important for Sagar port vessels as they transit between two adjacent VTSs that monitor different VHF radio channels. There are instances when Sagar port vessels do not answer when sailing in the MahaDevi channel and I was told that one important reason is not being attuned to the appropriate radio channel. The following examples pertain to *Jharna*, which is scheduled to arrive at the pilot station at 10:15 p.m., however, *Jharna* is not answering any of Sagar port's calls on VHF channel 15. In example 6.16, Sagar port wants *Jharna* to switch to VHF channel 17, the working channel of Sagar port, presumably to give some instructions to the vessel shortly due to arrive at the pilot station. The vessel is not answering important summons from its destination port and is not monitoring the VHF channel of the area it is sailing in.

Example 6.16: Sagar Port, call to *Jharna* Sailing in MahaDevi Channel; No Response
5765. **Sagar Port –** *Jharna*, *Jharna*, Sagar port
5766. **Sagar Port –** Jharna one seven, one seven

Example 6.17: Sagar Port, call to *Jharna* Sailing in Mahadevi Channel; No Response
5772. **Sagar Port –** *Jharna*, Sagar port
5773. **Sagar Port –** *Jharna*, *Jharna*, *Jharna*, Sagar port

Example 6.18: Sagar Port, call to *Jharna* Sailing in Mahadevi Channel; No Response
5915. **Sagar Port –** *Jharna*, *Jharna*, *Jharna*, Sagar port

We only hear about *Jharna* after the pilot has boarded it on its inbound journey and calls the VTS in the key communicative act of post pilot boarding (example 6.6, p. 211). The vessel has not responded to any of the calls previously, which is a concern as monitoring the appropriate VHF channel for the VTS sector/port waters one is sailing in, is crucial to the participation in a VTS. Serious accidents with fatalities have taken place in VTS areas such as the collision between *Western Winner* and tanker *British Trent* that resulted in a fire and the loss of nine lives (chapter 1, p. 7). The accident investigation report stated that Western Winner was unaware of the existence of a VTS and 'reinforces the note about participation in the VTS system'(MAIB 1995, p.14). Monitoring of the appropriate VHF channel by vessels moving between different VTS areas is an issue that will always face the two neighbouring ports of MahaDevi and Sagar.

The following sub-section explores the communicative strategies and methods employed by the VTS operators to make themselves understood and get the message across to increase the uptake of the VHF radio messages.

6.4.2 Key Communicative Strategies and Interactional Practices

6.4.2.i 'Hum Unko Samjha Dete Hai'[112] (Translation – We Make Them Understand)

To relay messages clearly, the VTS operators utilise several communicative strategies like repetition, intonation, correction, seeking confirmation, speaking loudly and enunciating slowly etc. The VTS operators use words like 'confirm' and 'copy' extensively to encourage the acknowledgement token from the recipient. The confirmation is forthcoming as either the 'confirmatory form' (Bailey et al. 2006) with the full repetition of the information from the preceding utterance or a reformulated 'read-back' (IMO, 2002, Froholdt, 2011). Even though this study is not visualised in the CA tradition, I transcribe some excerpts in the tradition to highlight the interaction strategies employed by VTS operators in the interactional accomplishment of safe traffic movement.

The following excerpts highlight the use of the communicative strategies of repetition within the same turn, speaking loudly, speaking slowly, speaking with emphasis, extending vowels and deploying intonation to ask a question.

Example 6.19: Increasing pitch, repetition, using intonation to ask a question

2455. **VTS –** What is your ↑vessel name? ↑Vessel name?

Example 6.20: speaking slowly, increasing pitch with emphasis and repetition

2461. **VTS –** India Bravo Alpha Delta (.)↑<u>sp</u>ell out your vessel name (.)↑<u>sp</u>ell out your vessel name

[112] Interview VTSO 1

Example 6.21: Increasing pitch, emphasis, repetition and using intonation to ask a question
2463. **VTS –** *Five Bay*, what is your ↑eta to pilot station? ↑eta to pilot station?

Example 6.22: Emphasis, extended vowels, increasing pitch and using intonation to ask a question
2476. **VTS –** *Five Ba:y*, I am ↑a:sking, what is your e:ta to pilot station? (.) ↑e:ta pilot station?

Example 6.23: Emphasis, extended vowels, increasing pitch and intonation to ask a question
2482. **VTS –** What is your GRTee?, ↑Gross tonnage?

Example 6.24: Emphasis, increasing pitch and intonation to ask a question
2490. **VTS –** Your ↑cargo, ↑cargo?

The 'confirmatory form' (see Bailey et al. 2006) is a feature of port institutional talk, however, it is used sparingly in MahaDevi port. Especially during lengthy VHF conversations, the confirmatory form is largely done away with to reduce radio occupancy (see Hutchins 1995; Falzon 2009) and alternative emic sense making formulations/rules are used instead (see example 6.27, p. 224-226, for reformulations of the 'confirmatory form'). In the extended initial contact between the VTS and *Global Atlas* lasting approximately two and a half minutes, there is only one instance of the confirmatory form (example 6.25, below) in the conversation in which several pieces of important information were communicated.

Example 6.25: Confirmatory form
2081. **VTS –** what is your eta ↑pilot station, eta ↑pilot station?
2082. **GA –** my eta (.) pilot station is (.) one six two zero (.) repeat one six two zero, over
→ 2083. **VTS –** one six two zero (.) what is maximum draft, maximum draft?

At times the VTS operator corrects the erroneous information provided by the vessel. The correction serves to provide a common frame of understanding to both participants. In the example below the vessel had provided a wrong ETA of 1300 hours which the VTS corrected as the time was already 1400 hours at the time of the said interaction.

Example 6.26: Correcting information
2464. **Five Bay –** My eta pilot station is one three zero zero, one three zero zero. Over
2465. **VTS –** Where are you now? What is your present location?
2466. **Five Bay –** Stand by now, I will give you my present location by, by latitude and longitude, please stand by
→ 2467. **VTS –** You have given your eta pilot station one three zero zero and it is already one four zero zero

→2468. **Five Bay –** Sorry Sir, correction, one five zero zero, it was my mistake sorry, one five zero zero

A content analysis of the transcript utilising the CAQDAS software ATLAS.ti, reveals that the word, 'copied' and 'copy' together are used 372 times in the transcript and taking the words back to their context, they are used to ask for or acknowledge the successful receipt of information. I found that the words 'copied', 'copy' and 'okay' are reformulations of the confirmatory form when used to provide an acknowledgement token (see Froholdt, 2011).

In lengthy VHF conversations like the extended initial contact with the vessel, the VTS moves the call forward in a string of question-answer sequences and rarely uses the confirmatory form – instead the VTS poses the next question in quick succession. Moving on to the next question is *the* confirmation that signals the successful receipt of the previous piece of information. I argue that 'moving on' can be understood as the reformulated read back/confirmatory form. Swiftly moving on and dealing with interruptions is integral to VHF radio communication. To nuance this, I utilise an example of the Extended Initial Contact between the VTS and the vessel *Tiger three,* which is the lengthiest VHF conversation and takes approximately 4 min and 50 seconds as opposed to the 2 1/2 min that is usually taken for such interactions. The length of the Extended Initial Contact (key communicative stage) makes it more prone to interruptions and is suitable for exploring how the members deal with interruptions on the VHF radio. In the example below, the conversation between the VTS and *Tiger three* is interrupted thirteen times[113].

Example 6.27: Inbound *Tiger 3*, Extended Initial Contact; Key Communication
1395. **T3 –** MahaDevi VTS, MahaDevi VTS, this is motor vessel *Tiger three* calling
1396. **VTS –** station calling VTS?
1397. **T3 –** uuhh this is motor vessel *Tiger* three (.) *Tiger* three
1398. **VTS –** yeah go-ahead
1399. **T3 –** uuhhh
1400. **O –** Delta, Oscar
→1401. **T3 –** my eta to pilot position one five (ringing noise in the background)
1402. **P –** *Jyot,* MahaDevi pilot
→1403. **T3 –** zero
1404. **VTS –** destination port?
1405. **P –** *Jyot,* MahaDevi pilot

[113] The shaded area depicts the interruptions.

1406. **VTS** – ↑*Tiger* three what is your destination?
1407. **M15** – M seventeen, M fifteen (ringing noises)
1408. **T3** – uuuh our eta pilot position one five four zero
1409. **M15** – M four, M fifteen
1410. **VTS** – ↑what is your ↑destination port?
1411. **L 203** – *Salvary, Salvary, liberty 203*
1412. 3.0
1413. **T3** – say again
1414. **M15** – M four, M fifteen (from line 1414-end of 1416 it takes 6 seconds)
1415. **Unknown** – zero six
1416. **M15** – M four, M four, M fifteen
1417. **T3** – MahaDevi VTS, motor vessel *Tiger* three
1418. **VTS** – what is your eta and what is (.) your (.) what is your destination port? Over.
1419. **T3** – my eta to MahaDevi, MahaDevi pilot position, pilot position is one five four zero local time
1420. **VTS** – okay but what is your ↑destination port? you are going to Sagar Port? Over.
1421. **T3** – my destination, MahaDevi
1422. **VTS** – o:kay can you spell out your ship name
1423. **T3** – my ship name Tango India Golf
1424. **M30** – M fifteen, M thirty
1425. **M15** – Bolo (transliteration) (translation – speak)
1426. **M30** – Kya speed hai abhi (transliteration) (translation – what is the speed now?)
1427. **T3** – Echo Romeo three three
1428. **M30** – okay because I have to go to number two dock channel for dredging also
1429. **M15** – your *NAM* comes later on, first this has to be done then *NAM* to follow
1430. **M30** – yeah I am slowing down, I will follow you only
1431. **M15** – that is correct
1432. 12.0
1433. **T3** – MahaDevi VTS, *Tiger three*
1434. 3.0
1435. **VTS** – can you say again your, repeat your ship name in phonetics
1436. **T3** – my ship (ringing)
1437. **A18** – VTMS, VTMS, Albatross (from line 1437-end of 1439 it takes 10 seconds)
1438. **T3** – Golf (.) Echo (.) Romeo (.) (ringing)
1439. **A18** – VTMS, VTMS
1440. **VTS** – okay ↑*Tiger three*, okay you are for MahaDevi port, correct?
1441. **T3** – yes, yes, that's correct
1442. **VTS** – okay copied, what is your eta?
1443. **T3** – my eta one five four zero, one five four zero
1444. **VTS** – maximum draft?
1445. **T3** – my maximum draft is eight point seven eight point seven
1446. **VTS** – last port of call?
1447. **T3** – my last port of call Lumud, Malaysia, Lumud, Malaysia
1448. **VTS** – what is the cargo?
1449. **T3** – my cargo consign chip indent, consign chip indent
1450. **VTS** – say again
1451. **T3** – consign chip indent
1452. **VTS** – No, what, can you spell out your cargo name, cargo name, what is the cargo name?

1453. **T3 –** uuh calci chip, calci chip
1454. **VTS –** o:kay, consign chip, correct?
1455. **T3 –** that's correct
1456. **VTS –** okay, what is your GRT?
1457. **M15 –** *Jyot*, *Jyot*, pilot M fifteen
1458. **T3 –** my GRT eight (.) two (.) one (.) three
1459. **M15 –** M four, M fifteen
1460. **A18 –** VTMS, VTMS, Albatross eighteen
→ 1461. **VTS –** okay what is the flag of the vessel?
1462. **T3 –** flag of the vessel is Vietnam
1463. **WB –** Offshore Supporter, Water barge
→ 1464. **VTS –** crew nationality?
1465. **T3 –** crew all Vietnam
1466. **VTS –** okay what type of your vessel?
1467. 3.0
1468. **VTS –** ↑what type of your vessel? ↑you are general ↑cargo, ↑tanker?
1469. **T3 –** my ship is general
1470. **M15 –** M seventeen, M fifteen
1471. 3.0
→ 1472. **VTS –** you stand by one five
1473. **T3 –** okay standby

This example reveals the difficulty in sustaining a conversation post interruption on a busy radio channel. The interruptions in the transcript are highlighted by shading and the interaction immediately following the interruption is marked for attention by arrows. Nine times out of thirteen, the interruption has been simply ignored and the conversation is moved forward as if no interruption has taken place, and in four instances the identity was re-established when there was a gap in the conversation. In three of the four cases, the identities were re-established when the gap in the conversation was significant – six or more seconds. Since this study is not a CA study, further exploration needs to be carried out to study identity establishment post interruptions on the port VHF radio. Preliminary exploration reveals that there is a propensity/tendency to simply ignore interruptions and move ahead with the conversation. Dealing with interruptions is an accomplishment (Garfinkel 2002). The busy radio channel hampers communication and makes it difficult for participants to get their share of air time. This makes the participants do away with extra on-air talk like exhibiting the confirmatory form and re-establishing identities and can be seen as an attempt by the participants to reduce airtime. A curly brace is used to highlight where the VTS operator quickly moves ahead with the questions, until he gets stuck and cannot understand the name of the cargo, whereupon the VTSO asks the vessel to repeat the name of the cargo (line 1450) and moves forward with the rest of the questioning only after he understands the cargo being carried by the vessel.

Strategic interactional practices are undertaken on the port radio that are geared towards enhancing the situational awareness of all listeners and facilitating the negotiation for passing/ overtaking/collision avoidance situations. These members' methods are discussed next.

6.4.2.ii Key Interactional Practices

Painting 'word pictures' of the current traffic situation in the channel, providing traffic updates of the opposing traffic a caller is likely to encounter in the channel and the interactional practice of first obtaining the current information from the VTS and thereafter calling the self-same entity to negotiate navigation are the orderly artful interactional practices performed on the VHF radio that facilitate safe traffic movement (Garfinkel 1967, 2011 edition, 2002, 2006). The examples below show the interactional practices operationalised on the VHF radio that contribute to situational awareness and help members achieve safe channel navigation.

Example 6.28: Opposing traffic and word picture of traffic situation

254. **SP2 –** VTS, VTS, SP two
255. **VTS –** SP two, VTS
256. **SP2 –** coming out on *APL Dubai* near MahaDevi port limit one zero one five
→ 257. **VTS –** okay copied, inbound for MahaDevi, (1.0) that is *Indra Dev* coming pilot station one one three zero for number two tanker berth and one tug and tow *Gold Medallion* and *Sovereign* coming pilot station one two zero zero
258. **SP2 –** okay only after eleven thirty. Anything going out?
→ 259. **VTS –** going out from one dock (0.5) that is (1.0) *Enchanting*, (0.5) out time (1) uuh already in the lock, in the process of coming out

The VTS operators utilise the brief pauses in the interaction (lines 257 and 259) to monitor the information on the screen and provide the latest information.

Example 6.29: Opposing traffic

1856. **Supplier –** MahaDevi VTS, *Supplier* outbound MahaDevi light house
→ 1857. **VTS –** *Supplier* copied, there is a *Hong Kong* inbound vessel ahead of you

Example 6.30: Opposing traffic and word picture of traffic situation

→ 9333. **VTS –** Inbound now, one dredger *Lucy two*, at pilot station then after that *Beluga* and then, *Global Atlas*

Example 6.31: Opposing traffic and word picture of traffic situation

5855. **SP 33 –** outbound with *Greatest Ship*, passing MPL two one one zero
→ 5856. **VTS –** okay, okay copied, *NAM 123* inbound now passing number four line

Example 6.32: Obtaining information from the VTS and then contacting the same entity

942. **M20 –** VTS, M twenty, which is the supply boat at the limit?
943. **M10 –** one two two zero, can't you come a little earlier?[114]
944. **M20 –** VTS, M twenty
945. **NAM 6 –** I will try to come earlier Sir
946. **M20 –** VTS, M twenty
947. **VTS –** M twenty, VTS
948. **M20 –** Which is the supply boat coming out from Sagar port at the limit now?
949. **VTS –** *Supplier*
950. **M20 –** *Supplier*
951. **VTS –** correct
952. **M20 –** and who is the pilot?
953. **VTS –** pilot not given
954. **Pilot –** *Kajal two four*, pilot
955. **M20 –** *Supplier*, pilot M twenty
956. **SP 37 on Supplier –** pilot M twenty, *Supplier*, good morning Sir SP thirty seven here
957. **M20 –** okay good morning twenty seven, I'm just off now number three tanker berth, going out on a tanker, *Variety* so doing presently about eleven knots, looks like I will be ahead of you, you can follow me. What is your speed?
958. **SP 37 on Supplier –** I am doing seven knots Sir
959. **M20 –** yeah in that case I will remain close to (disturbance & incomprehensible) you can follow me
960. **SP 37 on Supplier –** yeah roger, copied Sir, I will follow you
961. **M20 –** okay

Example 6.33: Obtaining information from the VTS and then contacting the same entity

6067. **SP 30 –** which is the second vessel outbound? I am just now passing one dredger
6068. **VTS –** second dredger *Kajal twenty*
6069. **SP 30 on B –** *Kajal twenty*, this is *Bhavini*
6070. **Kajal 20 –** Who is calling?
6071. **unknown –** one four, one four
6072. **Kajal 20 –** *Bhavini*, *Kajal twenty*
6073. **SP 30 on B –** *Kajal twenty* this is *Bhavini* I am passing the first dredger outbound so what is your intention?
6074. **Kajal 20 –** okay sir port to port with you.
6075. **SP 30 on B –** Yeah then you go more to your starboard please
6076. **Kajal 20 –** okay Sir more to starboard.

Interactional practices and communicative strategies help the VTS and other social actors to facilitate safe channel navigation. Knowledge of the interactional practices and communicative strategies taken together with the understanding of the vessel trajectories, key stages of

[114] Shaded utterances depict interruptions

communication, associated activities, ship-shore, inter-VTS, inter-ship and inter-pilot communication contributes to our understanding of the accomplishment of harbour/fairway navigation. The artful local accomplishment of communicative management of vessel traffic is rendered visible by this ethnographic study inspired by ethnomethodological workplace studies (Garfinkel 2002; Rawls 2008). The communicative groups/membership categories (Sacks 1989, 1992) on the port radio follow rules that are 'intelligible in situ' and help members carry out accountable actions. These local, emic, context dependent contingent rules are not the same as the prescriptive rules (IMO 2002b). The local situated rule following either completely does away with the prescribed rules or reformulates them as required. The following section explores local practices versus prescriptive rules.

6.4.3 Local Situated Actions Versus Prescriptive Rules

On the one hand are the delineated prescribed rules, like the IMO SMCP (2002), and on the other are the situated artful local practices (see Suchman 1987). This thesis does not explore philosophical 'rule following' (Wittgenstein 1953/1958), but the observable locally situated actions on the busy VHF radio (see Garfinkel 2002). A study exploring institutional maritime interaction needs to take into account the prescriptive guidelines provided in the IMO SMCP (2002). To promote communication along standard and predictable lines at sea, the IMO developed Maritime English (2000) along with the key instruments of Standard Maritime Communication Phrases (2002b) (that replaced the former Standard Maritime Navigational Vocabulary and SEASPEAK – a technical and standardised form of English for a specific purpose, task and context). Research on 'Transnational Seafarer Communities' by Kahveci et al. (2001; Sampson and Zhao 2003) points out that the use of Maritime English (IMO 2000, 2002b) was not observed on-board any of the ships researched as part of their project. There is a gap between the language prescription provided and the linguistic reality (un)observed on-board merchant ships. I argue that the researchers worked with a very narrow definition of maritime English restricted to the SMCP phraseology, hence the finding that maritime English was not observed on-board whereas maritime English is broader (than the (limited) SMCP) and encompasses basic nautical vocabulary such as, 'starboard, port, galley' etc. It is extremely unlikely that research in a maritime setting reveals no nautical vocabulary in use. Unlike Sampson and Zhao (2003), my study revealed the use of maritime English in ship-shore communication. Unlike Froholdt (2011), my data corpus revealed that uttering the name of the addressee thrice in the summons call (as required by IMO SMCP (2002)) was used but such calls were rare. My findings reveal that not all the prescriptive rules of the IMO SMCP (2002) were followed – they were followed in a selective manner, where required. This section discusses rule following in VHF interaction with respect to the IMO SMCP (2002).

Example 6.34: SMCP Recommended Format for Making a VHF Call
SMCP Recommended Format – *Lucy two, Lucy two, Lucy two,* VTS
In practice – *Lucy two,* VTS

In line with Froholdt (2011) my study shows that the 'read back' required by the IMO (2002b) and the 'confirmatory form' of Bailey et al. (2006) was reformulated by the speakers to minimise radio occupancy and move the call forward. While the SMCP (IMO 2002b) requires one action/piece of information per turn at talk, my study revealed highly dense, action saturated turns, similar to the finding of Froholdt (2011). In my study, the VTS operators did not suffix any of the eight message markers – *Instruction, Advice, Warning, Information, Question, Answer, Request* and *Intention* (IMO 2002b) in VHF interaction with ships.

The IMO SMCP (2002) recommendations for interaction between two adjacent VTS areas were also not followed. The two neighbouring VTSs – MahaDevi and Sagar port VTS do not make use of the phrases given in AI/6.3 'Handing over to another VTS'. The phrases given in the SMCP pertaining to handing over to another VTS are long and cumbersome. In practice, the two adjacent ports have their own method of acknowledging new vessels in the VTS area which has been discussed at length in section 6.3. Below are the exact phrases given in section AI/6.3 of the SMCP titled 'handing over to another VTS'. These can be compared and contrasted with the practical accomplishment and language used in real life.

Example 6.35: SMCP recommended format for handing over to another VTS
1… VTS this is… VTS: MV… Position is bearing… degrees, distance… Kilometres/nautical miles from…. Working frequencies VHF channel… Your target. Please confirm.
2... VTS this is… VTS: MV… Position bearing is … degrees, distance… Kilometres/nautical miles from…. I confirm. My target.
3... VTS this is… VTS: MV… Position bearing is … degrees, distance… Kilometres/nautical miles from…. I am unable to take over this target.

This is in stark contrast to how the VTS of the two adjacent ports in my study manage and acquire targets (vessels) as they move from one VTS area to another. First the Sagar port calls and provides its traffic movement schedule and thereafter the confirmation of targets between the two adjacent VTS is achieved by the pilots reporting each time they enter the MahaDevi port limits (see sections 6.2 and 6.3).

Example 6.36: Sagar port giving details of *Tetra Boom's* movement to MahaDevi VTS

→5786. **SP –** *Tetra Boom*, *Tetra Boom* off, two one zero zero, SP 13

Example 6.37: Pilot SP 13 on-board *Tetra Boom* calling MahaDevi VTS and facilitating target acquisition of his vessel; Key Communicative Act

→5899. **SP 13** – VTS, SP 13 outbound on container ship Tetra Boom at MPL two one three zero, draft ten point eight metres

5900. **VTS** – okay, copied

Another IMO SMCP (2002) rule not followed is the confirmation of identity with each turn at talk. The participants did not identify each other with each turn at talk. In practice identities are established once at the beginning of the conversation and subsequently the rest of the VHF conversation is carried out almost like a telephone call without identifying each other with every turn. If the identity of the speakers (shaded) were hidden, there would be no way of knowing who is conversing with whom.

Example 6.38: VTS & *Tiger 3*; Identities not confirmed with each turn at talk

1395. **VTS** – okay ↑*Tiger three*, okay you are for MahaDevi port, correct?
1396. **T3** – yes, yes, that's correct
1397. **VTS** – okay copied, what is your eta?
1398. **T3** – my eta one five four zero, one five four zero
1399. **VTS** – maximum draft?
1400. **T3** – my maximum draft is eight point seven eight point seven
1401. **VTS** – last port of call?
1402. **T3** – my last port of call Lumud, Malaysia, Lumud, Malaysia

In this section, the key themes and findings that highlight the achievement of harbour/fairway navigation have been discussed and next, I bring the findings from both chapters (5 and 6) together in section 6.5 to conclude chapters 5 and 6 that focused on the communicative management of marine traffic and the accomplishment of harbour/fairway navigation.

6.5 Conclusion

The office of the VTS is embedded in and integrated with port operations. The station office schedules traffic movement and pilots and pilot launches are assigned for pilotage assignments. However the VTS, together with the seafarers and pilots, interactionally operationalises and accomplishes the schedule on the VHF radio to achieve harbour / channel navigation. Chapters

5 and 6 identified the procedures, processes and in situ methods involved in accomplishing harbour/ channel navigation; identified the main vessel trajectories in the harbour, the key communicative stages of the respective trajectories and the associated activities of negotiating pilot boarding, passing, overtaking and collision avoidance manoeuvers. Taken together, a nuanced picture of the local practical accomplishment of harbour / channel navigation emerges in these two chapters (5 and 6).

Figure 6. 7: Snapshot of key findings

Vessel Trajectories
- I/B, O/B MahaDevi port vessels
- I/B, O/B Sagar port vessels
- Dredgers - cyclical movement

Themes
- Time & tide in traffic scheduling
  - Time mentioned in 24 hour format
- Monitoring appropriate VHF channel
- Micro politics of port communication
- Security concerns

Adjacency Pairs
- summons-response, question-answer and instruction-confirmation/ acknowledgement

Contingent Rule Following
- IMO SMCP used selectively and sparingly
  - Only used in extended initial contact
  - Not used in handing-taking over from another VTS
  - Summons-response sequence altered
- Readback / closed loop communication / confirmatory form used sparingly and largely appears as reformulation to minimise radio occupancy
- Identities not confirmed with each turn at talk to minimise air time

Key Communicative Stages
- I/B vessels - Initial contact, instructions to arrive at pilot station/to drop anchor at outer anchorage, after getting underway, reporting line, post pilot boarding, post pilot disembarkation
- O/B vessels - Ready to sail, pilot boarding instructions, post pilot boarding, post pilot disembarkation, exiting channel limits
- Dredgers – Permission to go out for dumping, passing pilot station (o/b), before entering the channel, passing pilot station (i/b)

Activities
- VTS - Accomplishing continuity between shifts
- VTS - Accomplishing traffic monitoring
  - Knowledge of traffic location
- VTS - Accomplishing traffic movement schedule
  - Managing delays
- Ship & pilot - Accomplishing pilot boarding
- VTS, ship & pilot - Negotiating passing, overtaking and collision avoidance
  - Intention display

Accomplishing Institutional Interaction
- Interactional practices
  - Information on opposing traffic, Word pictures for situational awareness
  - Obtaining information on entity from VTS and contacting same entity
- Accomplishing clarity and being understood
  - repetition, intonation, correction, seeking confirmation, speaking loudly & enunciating slowly, expanding vowels, using emphasis
  - Digits enunciated individually, Radio alphabet for phonetic spelling
  - Standard formats for most interactions like summons-response sequence
  - dealing with interruptions
    - Ignoring interruptions to persevere with interaction
- Changing VHF channel to leave main channel free
- Truncating utterances to minimise air time
- Making non-response hearable and holding the individual ship / pilot / VTSO accountable for the omission and obtaining appropriate response

The trajectory of a vessel is interactionally accomplished on the VHF radio via the key communicative stages, which in turn utilise members' methods, interactional practices and emic, local, contingent and situated sense making for accomplishment (for plans and situated actions, see Suchman 1987). The accomplishment of key communicative stages serves to create enduring order in the port for each next first time (Garfinkel 2006) and performs diverse functions such as monitoring traffic in the channel, placing and locating traffic in the channel, operationalising and maintaining traffic movement schedule and accomplishing safe and efficient harbour / channel navigation. Accomplishing key communicative stages in a vessel's journey is an accountable feature of VTS work.

Chapters 5 and 6 answer the main research questions pertaining to the work of VTS operators and its in situ accomplishment. The research questions answered by these chapters are recapitulated below –

- How do they work?
    - How is vessel traffic managed?
        - What are the practices, procedures and activities that facilitate vessel traffic management?
    - How is harbour / channel navigation achieved interactionally?
        - What is said, when, to whom, why, how and to what effect in furtherance of the communicative management and accomplishment of harbour/channel navigation?

The institutional language (see Drew and Heritage 1992) used by the participants on the VHF radio reflects their communicative competence (Hymes 1962; Goffman 1971, 2010 edition; 1972) and the embedded/situated emic nature of their interaction. The VHF technology does not allow for dedicated simultaneous two-way communication and thereby constrains the speakers (see Sanders 2003). The contrived talk that would appear extraordinary (see Sampson and Zhao 2003) in another situation, is intelligible in the social setting of the harbour. The participants follow mutually intelligible interactional practices on the port radio – time is almost always mentioned in the 24 hour notation, digits of numbers are mostly individually enunciated and the radio alphabet is used to phonetically spell words. The key adjacency pairs (see Sacks 1989, 1992; Schegloff 2007) that largely feature on the VHF radio are the summons-response, question-answer and instruction-confirmation/acknowledgement. The VTS gives instructions to ships pertaining to eta and etd and pilot boarding arrangements to be kept ready. The instructions by themselves are precursors to actioning the traffic movement schedule and it is in the following of the instructions by the vessels that the instructed action is accountable action with praxeological validity – *'working and being seen by others to work'* (Garfinkel

2002, p.41). Reporting at the reporting points and participating in the key stages of communication makes vessels accountable in the production of order in the channel. The setting of the port *'organises its activities to make its properties as an organised environment of practical activities detectable, countable, recordable, reportable, tell-a-story-aboutable, in short accountable'* (Garfinkel 1967, 2011 edition, p.33).

There is no face to face interaction (Goffman 1959; 1967) in the VHF radio talk between the spatially distributed participants. However, roles are performed by the participants in line with the roles imputed to them/expected of them by the members. Chapters 5 and 6 have explored the performance of the VTS, shipboard seafarers and the harbour pilots in the achievement of harbour navigation. For the large part, the VHF radio interaction is supportive interchange (see Goffman 1971, 2010 edition; Lemert and Branaman 1997, 2004 Edition). Ship to shore interaction on the VHF radio is a service encounter and institutional talk (Drew and Heritage 1992) that accomplishes the work (harbour navigation); is proactive, supportive, structured, constraining, contrived and sanitised. To explore the local achievement of harbour navigation, vessel trajectories, key stages of communication and associated activities and interaction between the main communicating groups (VTS, seafarers and pilots) in different combinations (inter-ship, inter-pilot, inter-VTS, pilot-VTS, pilot-seafarer, VTS-seafarer) has been taken into account in chapters 5 an 6. These two chapters reveal the mutual construction of the 'meaningful orderliness of social situations' in the port (Garfinkel 2002, p.5) and the construction of intelligible patterns of behaviour for 'each next first time' (Garfinkel 2002, p.30). By following vessels and pilots on their voyages I explored the temporal course of their engagements to understand the society from within and explore the endogenous production of stable, accountable practical activities that make and remake the social structure of their everyday activities (Garfinkel 1967, 2011 edition, p.185; also see Boden and Zimmerman 1991, 2003 edition). The order revealed is moral, based on trust that all participants will act in the interest of safety and the embodied, engaged, situated actions of participants reveal the recognizable enduring order of the immortal society in the port (Garfinkel 2006).

For sociolinguists there is the exploration of speech communities, speech situations, events and acts (Gumperz and Hymes 1964; 1986; Bauman and Sherzer 1989). I have approached this study from within the discipline of Sociology and adopted an eclectic approach towards social theory in this ethnographic study. I have drawn upon ethnomethodology, ethnomethodological workplace studies, interactionism and related ideas where required. I find that the role set of the participants on the VHF comprises the VTS operators, pilots and the shipboard seafarers. I find that the key communicative stages and associated activities are the intelligible frames (Goffman 1974 (1986 edition)) shaping the context and content of VHF radio interaction between the participants. I deploy Sacks' notion of membership categories to nuance the category bound activities they engage in (Sacks 1989, 1992; Hester and Eglin 1997). The VTS monitors; it primarily gives the instructions and the vessels follow, the pilots negotiate pilot boarding; facilitated by the VTS, pilots and seafarers negotiate meeting, passing, overtaking and collision avoidance situations for channel navigation. The VTS alters footing (Goffman 1981) for different participants of the port radio by building it into the recipient design and the ethnographic exploration of the port institutional talk reveals the interaction order of the marine radio (Rawls 1987; Drew and Wootton 1988 (2003 edition); Rawls 1989a).

From the complexity (Atkinson et al. 2008) of the harbourscapes in chapter 4, chapters 5 and 6 delve deep to reveal the method in the madness; cut through the clutter to reveal the organised interactional activities that achieve safe channel navigation and in this respect, come across as sanitized. This is true as there is much more communication taking place on the VHF radio than the institutional communication that accomplishes navigation. There is asymmetry in the knowledge distribution (see Komter 1995) in the port – the VTS is on top of things by virtue of the complex Decision Support System (DSS) available to them, while the pilots possess superior knowledge by virtue of their training, experience and expertise and the Dock Master in-charge of the Control Station has full knowledge of the traffic movement schedule as his office prepares it before it is made available to the VTS. The following chapter 7, 'Micro Politics of Port Communication' re-introduces the clutter on the marine radio and explores the themes of rank, status and hierarchy in the port, which, although not directly involved in the performance and achievement of harbour navigation, is a feature of VHF radio talk and affects the VTS operators and their work.

Chapter 7 Micro Politics of Port Communication

"I'm Captain. You shut up!"

So said the Captain to the 3rd Officer and the subordinate effectively learned to *'shut up'* and the *'shutting up'* spilled into their professional and personal relationships (Sampson and Zhao 2003, p.37)[115]. This reprimand introduces the themes explored in this chapter – of rank, status, power (see Foucault 1995a) and hierarchy that highlight the micro politics of communication in the Indian world port.

Even though the example above is from an on-board study, it is relevant to my research pertaining to VTS operators as it illustrates the inequality and inherent occupational hierarchy in merchant shipping (see Alderton and Winchester 2002; Sampson and Zhao 2003), of which the VTS is a part. Pilots in ports are accredited Master Mariners (qualified ship Captains) and at times perform their rank, status and hierarchy (see Goffman 1959) on the marine radio.

7.1 Introduction

The preceding chapters 5 and 6 discussed the *fine-grained, artful, in situ* (ethnomethodology of Garfinkel 1967, 2011 edition, 2002, 2006) interactional accomplishment (Sacks 1989, 1992) and the practices and procedures to manage harbour traffic and achieve safe channel navigation. However VHF radio communication[116] in the port has more to it than the communication undertaken solely for navigating ships from point A to B. It has been observed that all of the talk that takes place in an institutional setting may not be institutional in nature (Drew and Heritage 1992; Schegloff 1992). Chapters 5 and 6 discussed the institutional talk (Drew and Sorjonen 1997) and practices that accomplish institutional work for the port, while chapter 7 explores the subtle and not so subtle undercurrents of office politics to further contextualise the study and add to the dynamic backdrop (Husserl 1936/1970) against which, VHF radio communications take place in the port. This chapter aims to explore the micro-politics of port communication, especially the micro-politics that finds its way to the public radio broadcast on

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[115] The captain told the 3rd Officer to 'shut up' and the subordinate learned to 'shut up' and stopped speaking to the Captain voluntarily and subsequently constructed a pretext to go home early (Sampson and Zhao, 2003, p.37). This phrase invokes the power, rank, status, authority, role identity and all that the Captain/ Master stands for on-board a merchant ship.

[116] As contextualised in chapter 4 on 'Harbourscapes'.

the main working VHF channel of the port – primarily the communicative domain of the VTS operators, shipboard seafarers and harbour pilots. The internal politics of the port is gauged from the transcripts of audio recordings of the interaction on the VHF radio and from interviews with VTS operators and discussions with port officials. When the internal workings and communication of the port are broadcast and momentarily take centre stage ‘on air’, it negatively reflects upon the role, status and training of the VTS operators and the port itself. The 'on air' radio talk is available to all users attuned to the frequency and the undercurrents of port politics on the main working channel externalise the internal for the attuned audience. The micro-politics of port communication is integral to the *life world* (Husserl 1936/1970; Schutz 1967) of the VTS operators and poses a challenge to them in the performance of their occupational role identities in the harbour and in the accomplishment of institutional work. Chapter 7 stands in contrast to the preceding chapters 5 and 6, which present data that contributes to the understanding of the institutional achievement of navigation, while chapter 7 discusses the messy micro-politics of port communication. On the surface chapters 5 and 6 may come across as presenting relatively clean/sanitised institutional talk, however it is noteworthy that chapters 5 and 6 are also not free from micro-politics exemplified by the ‘on air’ reprimands and instances of pilots quarrelling on the marine radio (example 5.48, p. 189-190). The micro-politics of port communication is identified as an important workplace challenge by the researcher and accordingly treated at length in chapter 7.

The chapter also explores why the micro-politics of port communication influenced by power, rank, status and hierarchy features in the Indian world port. The findings are embedded in literature in the inherently hierarchical maritime tradition and the unequal Indian society to make sense of the interaction on the marine radio in the port. This chapter seeks to unravel the layers of rank, status and hierarchy in office politics. This is imperative as the micro politics of port communication can colour professional communication, introduce risk and pose a threat to the safety critical and time critical task of monitoring and navigating ships in restricted waters. Understanding of micro office politics is essential to informing practice, policy, training and improving safety in the port.

The chapter revisits the captive unseen audience in the harbour in section 7.2. The status of the VTS operators in the port is discussed in section 7.3. Section 7.4 discusses the high incidence of ‘on air’ internal communication, followed by section 7.5 on hierarchy in VHF communication. Section 7.6 explores the unequal distribution of knowledge in the port. Section

7.7 discusses the hierarchical maritime tradition and the unequal Indian society. Section 7.8 concludes the chapter.

7.2 The Captive Unseen Attuned Harbour Audience

Fishermen out for the day's catch, small barges, crew boats, pilot launches, ships at anchor – both inside and outside the port, ships moving in the channel (including naval and coast guard vessels) and harbour pilots, all tune in to the port working channel manned by the VTS operators to stay abreast of the latest traffic situation. At times the internal office politics is made available to this captive audience[117] on the marine radio and it becomes the unintended recipient of unpalatable office politics. The audience is regarded as 'captive' as it is mandatory for them to monitor the port working channel while in the VTS area. In the interest of safety (their own and of others in the vicinity); they cannot help, but listen in.

The local FM radio channel broadcasts for the entertainment of all attuned listeners geographically distributed across the city, while the VTS primarily broadcasts for specific individual ships and pilots to promote navigation safety in the harbour. Even though the VHF radio call is between two individual entities in the port, it is not a private/personal communication in the sense that firstly it is heard by all and secondly it is meant for all traffic in the vicinity to contribute to their situational awareness (see Cato 1995) and a shared frame of understanding of the narrative of the unfolding traffic situation in the channel in real time.

The 'free to air' broadcast, open and accessible nature of VHF radio interaction between the VTS and other actors lends a panoptic (see Bentham 1995; Foucault 1995a) and public dimension to the VHF utterances where an 'on air' rebuke becomes a 'public rebuke' and has consequences for embarrassment or losing/saving face (see Ho 1976; Rutten 2007; Lin and Yamaguchi 2011) for the VTS operators.

7.3 The Status of VTS Operators in the Port

The MahaDevi VTS operators have a low status in the port. It is not that they are perceived as having a lower status; they actually have a low status by virtue of their grade/rank. The

[117] The participants of the port VHF communication are also the audience when they are not transmitting a message themselves.

MahaDevi VTS operators are 'operators' and not 'officers' and their job is of a clerical grade. The MBPT VTMS operators believed that it would be better if their jobs were of an officer level instead of a clerical one. The following field note illustrates what an office clerk commented in relation to the clerical status of the VTS operators and his own job.

> He said that the VTS operators were clerks and that he himself was one, but given the difference in the nature of their jobs, he felt that for the same rank/grade and similar remuneration, there was a lot of stress and pressure in the role of the VTS. He went on to add that the extra stress and pressure in the VTSO role was not worthwhile (field note, 23 Dec 2010).

The VTS operators felt that there was high work load, stress and pressure in their job. It was believed that the work required of them did not match their grade or salary, which affected morale.

> Match nahi karta (transliteration). It doesn't match (translation) (Interview VTSO 1).

During my port site visits in the UK, I learned that VTS operators wore uniforms to work and the rank displayed on their shoulders was that of a Second Officer (which would be their rank if they were to go to sea), while the MahaDevi VTS operators did not wear uniforms when on duty. They wore personal clothes and the civilian attire of the Indian VTS operators was in sharp contrast to the white uniforms of the pilots and senior port officials. A VTS operator believed he would feel good if he wore a uniform with the rank displayed on his shoulders.

> The reference to the uniform with the rank displayed on the shoulders communicated the career aspirations of the VTS operator. He touched his collar and the shoulders where the rank would be and was animated when he spoke about the uniform and said 'achcha lagega'[118]. It appeared that their civilian clothes were a downgrade as they did not reflect or acknowledge the work VTS did, in the port (field note, 21 Dec 2010).

The low status, low grade/rank and perceived nominal remuneration all affect the morale of the VTS operators. The Deputy Harbour Master in a UK Port told me in front of the VTS operators on duty that, *"they are doing a very good job"* and that *"nothing in the port moves without them"* and that he would be grateful if the next time he piloted a ship, they would let

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[118] It will 'feel good' (translation).

him come in quickly (UK site visit 1/DHM). The same appreciation of work and motivation was lacking in the Indian port. Regarding the VTS operators, the Harbour Master said, *"What are they doing? Just talking to ships",* implying that the job of the VTS Operators was easy and that they are not doing much.

The VTS operators did not think they were valued or appreciated. The role of the VTS operators is inherently stressful by virtue of the safety critical and time critical nature of their job and internal micro politics further add to the stress. Even though externalising the internal politics has more to do with a limited number of officers, the fact that it is being done makes the VTS office a less than an ideal space from where to undertake safety related maritime communication. Taken together, the combination of factors of low rank/grade, status, hierarchy, remuneration, training and the micro politics of port communication along with the perceived stress, pressure, morale and motivation of the VTS operators do not contribute towards an ideal work environment (see Rodriguez-Munroz 2009; Childs 2012) that primarily seeks to promote navigational safety through maritime communication. I argue that the low status of the VTS operators contributes to the micropolitics of port communication. In the following section, I explore the high incidence of 'on air' internal communication that transgresses the domain of the VTS operators and is telling by virtue of the ancillary work delegated to them 'on air'.

7.4 High Incidence of 'On Air' Internal Communication[119]

The 'on air' conduct of internal office communication adds to the traffic on the busy radio channel and makes it readily available to all listeners. Internal communication offers an insight into port operations, however, the high incidence of internal communication on the main working channel of the port, transgresses the domain of the VTS operators, affects morale, increases perceived stress and poses a challenge to the VTS operators in the performance of their organisational roles. Internal 'on air' communication is a risk factor that could hinder ship-shore communication. The VTS operators believed that internal communication should not be conducted over the main VHF channel of the port but over the telephone or another VHF channel intended for internal use. Nevertheless internal communication was being carried out on the main port working channel. The transgression of their 'on air' space ties in with their clerical rank, training and the perceived lower status in the port.

[119] Internal communication broadcast on the main port working channel rather than conducted on the phone.

The following field note illustrates the observation concerning internal communication and the opinion of the VTS supervisor regarding the practice.

> I noticed that there was a high level of internal communication being conducted 'on air' and mentioned my observation to the VTS Supervisor. He said that he was glad that I noticed it. The manner of his saying implied that there was such a high incidence of internal communication that even without them telling me about it, an outsider like me couldn't help but notice. He further went on to add that the, *"internal communication should not be carried out on the main VHF channel just because it was easier to press a button than to dial a number"* (interview with VTSO-S).

One day during my fieldwork at the VTS office, internal communication was being conducted over the main VHF channel, when I asked the VTS operator, how the others listening in would feel. He replied,

> *"Bahut ajeeb lagega"* (transliteration).
> *"They'll find it very strange"* (translation, discussion with VTSO 1).

Concerning internal communication on the marine radio, he further said, *"uske liye phone diya hai"* (transliteration); *"we've been given the phone for that"* (translation) (conducting internal communication) (discussion with VTSO 1). The high level of internal communication serves to add to the stress of the VTS operators and makes them nervous. With respect to the high volume of internal communication on the VHF, a VTSO said –

> *"We are on tenterhooks"* (discussion with VTSO 3).

The internal communication sometimes irritates and exasperates the VTS operators as it hogs the VHF Channel and the VTS operators cannot get on with their work and make calls which they are otherwise wont to. The below mentioned field note depicts the exasperation of one such VTS operator –

> The VTS operator half stood up from his chair, and shook the handset in the air saying,
> *"Get off the VHF damn it!"* (field note, 23 Dec 2010).

I argue that 'on air' internal communication is discourteous, transgresses the space of VTS operators, is a potential risk factor and at times makes the VTS redundant. Internal communication is discussed in section 7.4.1 as a transgression impacting the role identity of

VTS operators, in section 7.4.2 as performance of knowledge displays, and re-inscribing the (low) status of the VTS operators through delegation of ancillary work in section 7.4.3.

7.4.1 Transgression of Air Space & Fuzzy Role Identities

According to Sacks'(1989, 1992) concept of membership categories, the VTS operators are members of the VTS group in the port and their shared, situated, social, occupational role identity directs the performance of their institutional role (see Foote 1951; Strauss 1959; Stone 1962). This study is not an exploration of the *identity* of VTS operators, however, the study refers to the interactionist notions of situated social identity (Vryan et al. 2003) and explores how identity is made fuzzy by the transgressions on the marine radio. Identity has been studied in the disciplines of Sociology (Fitzgerald and Housley 2002) and Psychology. Literature on role-identity is largely in the discipline of psychology – measuring role identity (Burke and Tully 1977), the link between identity and role performance (Burke and Reitzes 1981) predicting repeat behaviour and role identity salience in blood donation (Callero 1985; Chang et al. 1988), volunteering (Grube and Piliavin 2000; Laverie and McDonald 2007; Thoits 2012) and marketing. The literature also focuses on gender role identities (Burke and Cast 1997). Even though the majority of the literature is in the discipline of psychology, it reveals pertinent insights for this study. Role identity literature shows the link with performance (Burke and Reitzes 1981), organisational experiences and purpose and wellbeing of volunteers (Thoits 2012). Drawing upon this literature and making comparisons with the port, the research student can empirically document the unpalatable organisational experiences for the VTS operators on the marine radio, their lack of purpose when they are made redundant 'on-air' and their lack of wellbeing when they talk of stress. At times the air space of the VTS operators is transgressed and their very role identity comes under question when a senior port official goes on the VHF and attempts to do the work of the VTS operators for them.

A vessel, *NAM 11* was coming into MahaDevi port with a dead body on board and had communicated this to the VTSO, who in turn informed the Dock Master. Immediately after the first VHF call from *NAM 11*, the VTS operator picked up the telephone and communicated the nonstandard purpose of *NAM 11's* visit, to the Dock Master. The telephone call was awkward for the VTS operator and after the telephone call, he turned to me and the other operator present to discuss the phone call. The following field note expands on the telephone call and the subsequent discussion.

Immediately after the VHF interaction with *NAM 11*, The VTS operator called the office to communicate the nonstandard purpose of *NAM 11's* port visit; to offload a dead body. The call was awkward as the VTS operator appeared on the back foot and defensive in the interaction. The VTS operator justified the telephone call more than once by saying that it was a unique/peculiar case and the senior officer needed to be informed about it and that is why he had called. After the call he turned to me and the other present VTSO present and said that the officer was saying, *"Why are you telling me all this?"* and went on to add that if something were to go wrong then the same officer would have turned and said, *"Pehle kyun nahi bataya?"* (transliteration) – *"Why didn't you tell me before?"* (translation). The manner of his speaking was as if he were in a situation where it was, 'damned if you do and damned if you don't'. Either way the VTSO would get flak (field note, 23 Dec 2010).

Subsequently the Dock Master called the VTS on the VHF concerning *NAM 11* and its unusual cargo. In the following transcript excerpt (example 7.1), the internal communication on the main VHF channel affects the communication of VTSO with *NAM 11*. The internal communication taking place takes away from the role of the VTS in ship shore communication. I argue that internal communication chips away at the role expectations (Goffman 1959; Vryan et al. 2003) other attuned listeners may have of the VTS, given its safety critical traffic monitoring and control role in the harbour. Since the senior officer doing the internal communication has already gone on air and said everything that needed to be said in lines 425, 435 and 437, the VTS operator left it there and saw no need to communicate the same information twice to the vessel. The Dock Master exhibits his exasperation with the VTS operator in line 435. The manner of his utterance is as if he is talking down to someone who does not comprehend what the senior has so far been trying to communicate.

Example 7.1: *NAM 11* and the dead body; Internal 'on air' communication

423. **HC –** VTS, Harbour Control
424. **VTSO1 –** Harbour control, VTS
425. **Harbour control –** Sangram[120] inform *Nam eleven* to inform his agent (1.0) to inform police station (1.5) about dead body (.) and in the meantime you can ask her to come up to (.) pilot station east of pilot station and wait
426. **VTSO1 –** Yeah, Roger
427. **VTSO1 –** *NAM eleven*, VTS
428. **Harbour control –** also tell Pilot M fifteen to contact me, over
429. **VTSO1 –** *NAM eleven*, VTS
430. **NAM 11 –** VTS, VTS *NAM eleven*, *NAM eleven*, go-ahead Sahib (translation – Sir)
431. **VTSO2 –** Okay keep coming to the pilot station. What is your eta pilot station?

[120] The names of the VTSOs have been anonymised.

432. **NAM 11 –** Sir one two three zero, one two three zero sir, to pilot station
433. **VTSO2 –** Okay, one two three zero pilot station, please inform your agent that you are coming with a dead body, Over
434. **NAM 11 –** I have already informed Sahib
→435. **Harbour control –** Nahin, nahin, Naresh, tell him to inform his agent to inform (.) ↑Police station (.) ↑police station (.) dock ↑police station (translation – 'No, no')
436. **VTSO2 –** copied sir
→437. **Harbour control –** second part he should come (.) keeping in mind traffic and come safely and when she, as and when she comes, keep her at East of pilot station and wait till there is an order for her, and ask her to contact us

In line 425 the Dock Master wanted the VTS operator to inform the ship to inform its agent to inform the police. However when the VTS operator starts to follow through with this instruction in line 427, the official interrupts the operator in the very next line (428) with an ancillary request to ask pilot M 15 to contact him. The VTS operator re–establishes communication with *NAM 11* from line 429 onwards but he is relieved mid-call by another VTSO who had been present in the office. From line 431 onwards the second VTSO takes the call forward. Even though he had been listening in, there is a lack of continuity and the new VTSO omits to mention that the ship's agent needs to inform the 'police station' in line 433. The Dock Master in line 435 repeats the phrase 'police station' thrice with increasing volume and stressed enunciation. The following field note further elaborates –

> I felt uncomfortable and cringed for the VTS operator. The senior officer spoke down to him. I felt embarrassed for him and thought of all the other radio users listening in and was conscious of my presence in the VTS office. The senior officer repeated his instructions so many times that the VTS operator did not bother to re-establish contact with *NAM 11* as the ship would have heard everything anyway. The manner of the senior officer's speaking was as if he has to do everything for the VTS operators (field note, 23 Dec 2010).

The Dock Master made the VTS redundant on the VHF with the transgression of their air space and challenged and confused their role identity for other listeners. Noteworthy in example 7.1 is that the Dock Master addresses the VTS operators on duty by their first names on the VHF. In this example he has used the first names twice to refer to the two different VTSOs who took the call. The Dock Master recognises the voices of the VTS operators and can easily refer to them by name. I argue that the use of first names on the official port channel comes across as an attempt to affix accountability for delegated tasks in the panoptic environment of the VHF radio (see Rainbow 1991). Using first names on the marine radio takes away from the role identity of the VTS, comes across as unprofessional and serves to undermine the VTS' status.

For the VTS Operator, there is a telephone on the desk to make an internal call; however, the senior officer can choose between the telephone and the VHF to make an internal call cum external announcement. The Dock Master chose the VHF to instruct the VTS operator on what the latter should communicate to the ship. The choice of the VHF over the phone itself has consequences for VTS operators, as it has an inherent public dimension where others can listen in on the internal workings, hear the rebukes and gauge the perceived status of the VTS in the port. The VTS has access to real time traffic scenarios on their screens and ships depend upon the VTS for information pertaining to movement in the channel. Broadcasting internal content takes away from the (implied) perceived status that the VTS should be in control in the port. The choice of broadcasting internal communication reflects poorly on the port, makes the VTS redundant and leads to duplication of effort in terms of communication.

The main VHF Radio channel is ideally a neutral public domain, inappropriate for anything other than radio communication primarily concerned with safety. The fact that it is being used for airing internal communication ties in with the clerical lower rank, status and hierarchy of VTS operators in the port. It can be argued that simply because there is an occupational hierarchy in the port, it does not imply that the senior pilots and Dock Master can talk down to the VTS operators as they should interact as equals in the professional marine radio interaction situation. Hutchby (1996a) uses conversation analysis to study ‘confrontation talk’ to highlight the ‘arguments, asymmetries and power on talk radio’. Even though the interaction on the marine radio is largely not ‘confrontational’[121] or argumentative in nature, it is asymmetrical and power can come to the fore through the use of rebukes, reprimands and knowledge displays. Hutchby (1996a) argues that although talk radio is asymmetrical, power is not an absolute monolithic to be exercised by the radio host. Power can also be exercised by the callers utilising the resources available to the host (Hutchby 1996b, a). The VTS operators do not exercise power over the marine radio with their seniors, but at times, retaliate in different ways (see section 7.5). The VTS operators mostly exercise their power over small barges and small craft as it has the power to withhold and/or sanction movement in the channel. The VTS reprimands smaller craft and merchant ships to exercise power, explored subsequently in section 7.5. This study is not a discourse analytic study of power on the marine radio, however, it does find that

[121] There are examples of confrontational interaction between pilots. What is noteworthy is that confrontation is between equals in the port and the VTS does not confront the seniors on the radio or otherwise.

power in the form of asymmetry in rank, status and hierarchy is diffused in the interaction on the port radio and *'not a zero sum game'* (Foucault 1995a). Internal communication in the form of knowledge displays on the VHF serves to belittle the VTS, and is discussed in section 7.4.2.

7.4.2 Knowledge Displays

Knowledge displays have largely been studied utilising conversation analysis as an interactional resource for demonstrating recipiency (Kidwell 1997); in the field of education by deliberately designing incomplete utterances (DIU) as a pedagogical practice to elicit responses from students (Koshik 2002); or cultural displays of knowledge in a classroom (Lazaraton 2003). The Dock Master cum senior pilot uses knowledge display to perform his superiority in rank, status, hierarchy and training (Goffman 1959). For the senior pilot the display of knowledge is a performative resource. In the example below (7.2) the Dock Master is piloting a vessel *Ocean Pioneer* and asks the VTS operator if another pilot on *Jyot* was underway. The VTS operator responds in line 1558. The Dock Master's reaction in line 1559 is spoken like a classroom teacher and affects the response of the VTS operator in line 1560, in which he justifies that he has not received the underway time from the pilot on board *Jyot* but he knows that the vessel is getting underway as he had monitored *Jyot* speak with *NAM 123*. The VTS operator resorts to speaking in Hindi to further clarify his point. The Dock Master in line 1561 takes an extended turn and explains when a vessel is considered to be underway. Lines 1559 and 1561 spoken by him are a display of knowledge by virtue of his superior maritime training. Line 1561 directly pertains to Rule 3 of the *Rules of the Road* that lists *General Definitions* and *'underway means that a vessel is not at anchor, or made fast to the shore, or aground'* (IMO 1972). This directly points to the superior training of the senior pilot cum Dock Master and the lack of the awareness of the *Rules* by the VTS operator. The same could have been told to the VTSO off air, privately or in a training exercise for VTS operators. The on air utterance re-inscribes the low status of the VTS and adds to the stress of the VTS Operator and comes across as a public rebuke.

Example 7.2: Knowledge display

1557. **DM/Pilot on-board Ocean Pioneer –** Naresh, pilot *Jyot* is underway now?
1558. **VTS –** Yeah he's getting underway, turning now.

→1559. **DM/Pilot on-board Ocean Pioneer –** What do you mean he's turning and not underway? He is, he is underway, No?[122]

1560. **VTS –** Underway time nahi diya hai lekin[123] (translation – not given the underway time) ship, pilot, just I have monitored that she says to the that *NAM one two three*, I am turning

→1561. **DM/Pilot on-board Ocean Pioneer –** yeah Naresh, that is what I'm saying, any vessel which is turning, has to be underway, otherwise (1.0) on anchor. Okay noted and *NAM one two three*, where is she going?

1562. **VTS –** for dredging, uuhh here only I think[124]

> The VTS operator seemed irritated and embarrassed. He was spoken down to, by the pilot. The interaction did not appear to be between colleagues working in the port but between a senior and a junior, which does not augur well for the work of the VTS operator (field note, 23 Dec 2010).

The pilot's utterances (lines 1559 and 1561) are like a public rebuke and can embarrass the VTS operator. The 'on-air' interaction in the above extract portrayed the VTS Operator as an under qualified junior that *'strikes at the heart'* of marine radio communication similar to the findings of Bailey et al., (2006) in 'Bridge Team Talk'. A repair is attempted by the pilot towards the end of line 1561 when he says, *'Okay, noted'* and goes on to ask a question about *NAM 123*. However, the repair is unconvincing and the damage had been done. The interaction in the extract above served to confuse the VTS operator and affected his response in line 1562 in which he was unaware of the movements of *NAM 123* and also affected his next interaction with a ship called *Albatross 11* which had been trying to contact the VTS for some time and in the excerpt below had received a response from the VTS for the first time.

Example 7.3: Internal communication; in possession of key information; negating the VTS

1569. **Albatross 11 –** VTMS, VTMS, *Albatross eleven*

→1570. **VTS –** *Albatross eleven,* what is the programme? Where are you now?[125]

1571. **Albatross 11 –** VTMS, VTMS, *Albatross eleven*

1572. **VTS –** *Albatross eleven,* go-ahead

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[122] This study is not visualised in the Conversation Analytic tradition, however it finds that in Indian English there is a propensity to sometimes ask a rhetorical question ending in the word 'no?'. The import is that the answer to such a question cannot be, 'no'.

[123] Line 1560 of example 7.2 also draws attention to the non-participation of the vessel *Jyot* in the key stages of ship–shore communication (discussed in Chapter 5). The vessel did not communicate with the VTS immediately after pilot boarding which is a key communicative stage.

[124] Not being sure of all the movements in the channel points to the lack of situational awareness and adequacy of available technological support (chapter 4).

[125] Asking such questions of ships does not portray the VTS as clued-in and on top of things. This points to the lack of technological support available to the VTS operators (see chapter 4).

1573. **Albatross 11 –** Sir we are requesting for a pilot we are in number two dock. Over
1574. **VTS –** The programme not yet received. *Albatross eleven,* programme not yet received.
→1575. **DM/Pilot on-board Ocean Pioneer –** *Albatross eleven*, one four
1576. **Albatross 11 –** one four, Sir

The response of the VTS in line 1570 of the above extract is not helpful. *Albatross 11* was ready to depart and was requesting a pilot. Since the VTS had not received the programme, the same was conveyed to the vessel. The pilot on-board *Pioneer* once again came in (line 1575) and asked *Albatross 11* to switch to channel 14 presumably because he knew something more than the VTS about the programme for *Albatross 11*. Ideally the information should have been made available to the VTS. Unequal distribution of knowledge is further discussed in section 7.6. The participation of the Dock Master in the call between the VTS and *Albatross 11* side-lines the VTS. It can make listeners wonder about the quantity and quality of information possessed by the VTS and raise questions about who is really in charge.

In line 1562, example 7.2, the VTS operator is not sure of the destination of dredger *NAM 123* and in line 1570, example 7.3, the VTS operator is not sure of the programme and location of *Albatross 11*. This points to the gap in the technological support available to the VTS operators (discussed in chapter 4) and also points to the fact that finding and remembering all of the traffic information when the questions are coming in thick and fast is problematic leading the VTS operators to ask questions of ships to facilitate the interaction. The lack of continuity when a new VTS operator takes over the shift (discussed in chapter 4) further impacts operator situational awareness. The above empirical examples of extracts from VHF interactions serve to demonstrate the anomalies in the VHF interaction between the VTS office and the Dock Master. Such interactions serve to undermine the credibility of the VTS which is detrimental to their work. Closely related to the 'on air' internal communication, is ancillary work which is requested of VTS operators on the main working VHF channel of the port, and is explored next.

7.4.3 Ancillary Work[126]

MahaDevi VTS receives ancillary work requests on the VHF which are not directly related with speaking to ships. These requests are mainly utilised by the pilots and senior port officials

[126] The requests for ancillary work were absent from the working VHF channel of the two VTS and one LPS in the UK.

to get some (at times, superfluous) work performed. The ancillary work requests serve to re–confirm the low status of the VTS operators and come across as delegating extra work to juniors who do not seem to be doing anything terribly important. In the extract below, pilot M 20 asks the VTS to inform the shipping assistant to call him. The pilot is in the channel on-board a vessel and would probably like to discuss something with the shipping assistant.

Example 7.4: Ancillary work
1270. **M20 –** VTS, M twenty
1271. **VTS –** M twenty, VTS
1272. **M20 –** Yeah just inform shipping assistant to call me on channel one four
1273. **VTS –** Okay

In the following extract (7.5), the pilot on board *Ocean Pioneer* calls the VTS to ask the Dock Master to call him on his mobile. The ancillary work request is unnecessary as the pilot is in possession of a mobile and could have directly made the call to the Dock Master himself.

Example 7.5: Ancillary work
1156. **OP –** Just ask DMCS if he can call me on mobile. Okay, thank you
1157. **VTS –** Okay

Example 7.6: Ancillary work
430. **HC –** VTS tell pilot thirty he can talk to me
431. **VTS –** M thirty, VTS
432. **M30 –** VTS, M thirty
433. **VTS –** Harbour Control wants to talk to you
434. **M30 –** Control, M thirty

The VTS receives a request for ancillary work like making a telephone call, etc. and thereafter the VTS follows it up by performing the request in question. The request for a telephone call makes the VTS come across as a long distance telephone operator. I argue that ancillary work requests should have no place on the marine radio as it impinges on the monitoring role required of the VTS operators. There are innumerable demands on the VTS operators – they monitor ships and answer VHF calls incessantly. In addition to the VHF radio calls, they carry out ancillary work requests, complete necessary paperwork and answer the telephone[127]. Requests

[127] In the UK VTS offices the VTS operators would only take telephone calls in the evening when the office staff had left for the day, whereas in MahaDevi, the VTS operators are manning the VHF as well as the telephone.

for ancillary work highlight the work organisation in the port and re-affirm the low status of the VTS. Ancillary work requests come across as – "You're a clerk. You can do this as well".

On-air internal communication is an integral feature of interaction on the port radio and is highlighted through the accomplishment of the transgression of air space; making fuzzy, the role identity of the VTS; displays of knowledge by the superiors and through the delegation of ancillary work by the senior pilots and the Dock Master to the VTS. Internal communication is accomplished on the port radio and is an accountable feature of work. Section 7.5 below explores the hierarchy and its re-inscription in the port VHF radio communication.

7.5 Asymmetry in the Port

An asymmetry is discernible between the senior pilots, officers and VTS operators on the port VHF radio. The asymmetry between the personnel is highlighted in section 7.5.1 by empirically showing the hierarchy on the radio; reprimands are discussed in section 7.5.2 and the performance and accomplishment of power, rank and status in 7.5.3.

7.5.1 Hierarchy in the VHF Communication

Individuals of various rank, role and status work in the port and at times this hierarchy comes to the fore in VHF conversations on the main working channel of the port. The presence of hierarchy on the VHF suggests that at times social relations drive the process rather than operational imperatives. Displays of status are made by invoking hierarchy in the port and this does not augur well for the VTS operators or the port, and it impacts negatively on the role performance of VTS operators and can further impact safety.

The VTS operators felt that each caller thought that his call was important and merited an immediate answer. The theme of hierarchy in the callers is depicted in the below mentioned VHF radio transcript extract and related field note in which a pilot tells the VTS that he has only asked for a single piece of information, which the VTSO has so far not responded to –

Ek hi cheez puchchi hai aapse. Bata ke nahin de rahe ho aap[128]

[128] The pilot had spoken in Hindi. The utterance has been translated by the student into English in the field note.

> In an incoming VHF call, the pilot said, *"I have asked you for only one thing and you are just not answering"* (translation); the VTS operator had been busy taking other calls from ships. A ship calling the VTS would assume no hierarchy, however VHF calls from pilots and the Dock Master appear to have a steep hierarchy as an officer would be speaking to a clerk (field note, 25 Dec 2010).

The pilots are higher ranked than the VTS operators and have a high status in the port. They are accredited officers with Master Mariner licenses. The VTS operators felt that at times they were at the receiving end of the VHF radio and the telephone. Their job is ‘safety critical’ and ‘time critical’ in nature and the work atmosphere in the port did not help in the accomplishment of institutional work. The following excerpt illustrates the hierarchy assumed by some callers.

> Everyone just wants to pick up the VHF and call..... they don't want to listen, just want to be heard first (interview with VTSO 5).

Hierarchy works both ways in port VHF communication. The VTS operators have a higher status when they speak to small craft, but it is when the VTS operators are at the receiving end that it impacts negatively upon their role identity. International merchant ships have priority over barges and other small craft in the channel and the VTS operators speak to them accordingly. When a small craft calls the VTS, it is usually told to wait for all the traffic to clear before crossing the channel. The VTS speaks to them in vernacular and if required can even reprimand them as the following examples illustrate. This is more or less in line with my site visits to VTS offices in the UK as small pleasure craft would be asked to wait when a big ship manoeuvred in the port. In one UK VTS office the VTS officers did not like to speak to small pleasure craft as it was felt that it was not a part of their job (UK site visit 2).

SriRam 2 called the VTS sixteen times in twelve minutes before it was finally granted permission to cross the channel. Out of the sixteen VHF calls *SriRam 2* made, fourteen received no response and on one occasion it was asked to wait before finally getting clearance the sixteenth time. In defence of the VTS, it was busy taking calls from ships and pilots who have priority over small craft and the VHF channel was crowded with inter-ship and inter-pilot calls. Example 7.7 below, is from the sixteenth VHF call where *SriRam 2 asks* for permission to cross the channel and uses the word ‘Sir’ in each of its responses (lines 3, 5 & 7) in recognition of the higher status accorded to the VTS operator.

Example 7.7: VTS and small barge *SriRam 2*

843. **SR2 –** VTS, VTS, *SriRam* two
844. **VTS –** *SriRam*, VTS
→ 845. **SR2 –** Namaskar Sir, anchorage three se bunder jaana hai aapka permission chahiye (translation – Greetings, sir. I need your permission to proceed from anchorage three to the docks)
846. **VTS –** anchorage three se bunder. Okay abhi clear ho gaya? (translation – from anchorage three to docks. OK. Is it clear now?)
→ 847. **SR2 –** Ji sir, clear ho gaya (translation – Yes sir, it is clear)
848. **VTS –** Okay, theek hai jaao jaldi niklo (translation – Okay, all right, proceed. Go fast)
→ 849. **SR2 –** Theek hai sir (translation – Okay Sir)

Small barges usually need to cross the main channel, for which they need to obtain the VTS' permission. The VTS prioritises communication with pilots and merchant vessels and delays responding to small barges, if required. Barges always provide the VTS operator with their current location and destination, and this information is utilised by the VTSOs to monitor their screens, prior to giving permission to the barges to cross the channel. The VTS operators are aware that there could be traffic in the vicinity of the barges, for which the system may not be receiving radar echoes and therefore ask the barges to confirm if the channel is clear, from where the barges intend to cross the channel. In example 7.7 above, the VTSO obtains information from the barge regarding the local physical traffic situation and utilises the information to give permission once the seafarer assures him that the area is clear.

In the extract below, the VTS operator is irritated by the non-participation of a barge in the VTS (a challenge that has been highlighted previously in chapters 5 and 6). The VTS operator wants the barge to report and leave the area in the interest of traffic safety. The VTS operator sternly tells the barge to identify itself and *'get out from there'*. The VTS operator invokes the authority of the VTS in his utterance to display his authority.

Example 7.8: VTS and a barge; Display of Authority

VTS – Yeh barge kaunsa hai anchorage three ke paas, VTS ko report karo. Yeh barge kaunsa hai anchorage three ke paas, VTS ko report karo. ↑You get out from there. (Translation – Which is the barge close to anchorage three? Report to VTS)

The VTS operators almost always speak in vernacular with small craft and try and align the small craft with the VTS' perspective using questions and rhetorical devices (Maynard 1991, 1992). The VTS has access to real time traffic scenarios on their display screens and the VTS attempts to map that onto the physical traffic situation in the vicinity of the small craft. The alignment of the small craft with the VTS' helps the small craft understand the traffic situation and accept the VTS' pronouncements in the interests of channel safety. In the example below the VTS operator wants the seafarer aboard the barge to stop, wait, look, and then judge the traffic situation for himself. Line 414 is spoken by the VTS operator like a rhetorical statement cum question and the seafarer aboard the barge cannot, but align with the VTS and wait for the traffic in the channel to clear.

Example 7.9: VTS and barge *Sagar*

411. **Sagar –** VTS, VTS barge *Sagar*
412. **VTS –** *Sagar*, VTS
413. **Sagar –** Good morning sir, anchorage three se bunder jaane ka hai permission chahiye sahib ji[129]. (Translation – I need to go from anchorage three to the docks. I need your permission sahib/sir).
414. **VTS –** Aap ruko, udhar ruko aap ruko, dekho na traffic, dekho na zara kya haal hai. (Translation – You wait. Wait there. You wait. Just look at the traffic. Just look at the traffic situation)

In the example below, *Ocean Princess* wants to cross the channel and the VTS informs it in line 265 that a ship is coming from the neighbouring port and *Ocean Princess* should wait for it to clear, which the seafarer accepts in line 266.

Example 7.10: VTS and barge *Ocean Princess*

262. **OP –** VTS, VTS, *Ocean Princess*
263. **VTS –** *Ocean Princess*, VTS
264. **OP –** Anchorage three se bunder jaana hai (Translation – I want to go from anchorage three to the docks)
265. **VTS –** Abhi Sagar port se ship aa raha hai, clear hone do (translation – There's a ship coming from Sagar port, let it clear.)
266. **OP –** Clear hone ke baad jaaunga (translation – I will go after it clears)

Speaking to small craft has nothing to do with communicating in Maritime English (IMO 2000). It is completely divergent from any standard, prescribed and structured norms of maritime communication. It is an interaction with a local seafarer aboard a small craft, largely in Hinglish (a mix of Hindi and English) (see Kachru, 2006) and rhetorical questions are used to align these seafarers with the decision of the VTS operator(s) and make them wait for ships that have priority in the channel.

[129] The suffix 'ji' in Hindi is used to communicate respect while referring to persons.

International merchant ships use the call sign, 'MahaDevi VTMS' or ‘MahaDevi VTS’ to call the VTS. After initiating the VHF call with the call sign, during the course of the VHF conversation, the shipboard seafarers tend to use the word 'Sir' to refer to the VTS operator. The impersonal call sign of 'MahaDevi VTMS' is used to refer to the port entity/service provider and 'Sir' is used to refer to the individual VTS operator. The use of ‘Sir’ changes the footing (see Goffman, 1981), personalises the call and recognises the higher authority of the VTSO as he has the power and authority vested in him to direct ships. The following excerpt exemplifies this practice.

Example 7.11: VTS and tanker *Five Bay*

1. **Five Bay –** MahaDevi VTMS, MahaDevi VTMS, this is motor tanker *Five Bay*, *Five Bay*, calling come in. Over
2. **VTS –** Station calling VTS, go-ahead (......) (lines omitted)
3. **VTS –** Okay just stand by, just stand by
4. **Five Bay –** I'm standing by Sir

In the example below, *MV Infinity* needs to make a call at MahaDevi port (after having visited the neighbouring Sagar port) and it requires a pilot. The Christmas holidays are a couple of days away and the seafarer does not want to be delayed in port due to the holiday season[130] (For temporal dimensions of seafarers’ work and families, see Thomas and Bailey (2009)). In line 2877 the Seafarer addresses the VTS operator as 'Sir' five times in the space of one VHF turn.

Example 7.12: VTS & MV Infinity; ‘Sir’, ‘Sir’ and ‘Sir’

2876. **VTS –** Yeah you can go out and give your particulars then we’ll, once there is a pilot we’ll call you, okay. Now you can go directly out
→2877. **MVI –** Okay sir we’ll proceed out sir. For your kind little consideration sir that you (.) now that because of the holidays, ensuing holidays, my work will get stuck (.) in case you can help me out sir, nothing like it sir.
2878. **VTS –** Just stand by
2879. **MVI –** Thank you very much

The VTS operator is impersonal in his responses as he can only advise the ship once he has received the information pertaining to the pilot booking and the designated berth for the vessel. The seafarer in line 2877 accords respect and higher status to the VTSO to attempt to speed up his work. Higher status maybe accorded to the VTS by the seafarers to get their work done, however the occupational hierarchies on the radio suggest that the pilots are higher ranked than

[130] For the seafarer there is no holiday – just constant work and travel till the end of the contract.

the VTS operators as indicated in the preceding sub-section on the high incidence of on-air internal communication. In the following section (7.5.2) I explore rebukes/reprimands on the VHF radio.

7.5.2 Reprimands

A rebuke or a reprimand may be given by the Dock Master and senior pilots to the VTS or by the VTS to ships and small craft. The rebukes are public in nature as they are made on air and serve to re-inscribe the rank, status, authority and control of the speaker at that particular juncture. Reprimands serve different functions depending on the context of use. In the extract below the VTS rebukes *Jyot* for not replying on channel 15. The background is that the designated pilot for *Jyot* had been trying to call the vessel for some time and on not receiving any answer from the vessel, the pilot contacted the VTS.

Example 7.13: VTS & *Jyot*; reprimand for not answering

1106. **M4 –** VTS, M four
1107. **VTS –** M four, VTS
1108. **M4 –** VTS can you raise this *Jyot*, he's not answering on one five
1109. **VTS –** *Jyot*, *Jyot*, VTS
1110. **VTS –** *Jyot*, *Jyot*, VTS calling, come in
1111. **DS –** MahaDevi VTS, MahaDevi VTS, motor tanker *Dreamy Sky* please come in
1112. **VTS –** *Jyot*, *Jyot*, VTS
1113. **Jyot –** this *Jyot*, go ahead please
1114. **VTS –** *Jyot*, you stand by one five. ↑Why are you not replying channel one five? You have been calling many times (.) Your pilot also calling. You just stand by one five and wait for pilot call. Pilot will call you. Over.
1115. **Jyot –** Very strange because now we are answering and we are on channel one five
1116. **VTS –** Okay pilot will calling, you just answer
1117. **Jyot –** Okay
1118. **M4 –** *Jyot*, *Jyot*, pilot
1119. **Jyot –** MahaDevi pilot
1120. **M4 –** Okay are you ready for docking now? ……

Responding to a VHF call in the port is a moral obligation in the maintenance of order (see, Sacks, 1989, Schegloff, 2007). The reprimand is used in example 7.13 to point out the omission and make the vessel accountable for a response. In line 1114, the VTS operator does not wait for an answer to his question, *'Why are you not replying channel one five?'* The question is spoken in an accusatory tone pointing out the omission of the vessel's moral obligation and holding it accountable. The seafarer says that he finds it strange as he is talking to the VTSO on channel one five (line 1115), to which the VTSO, who now has the full attention of the seafarer, responds and prepares him to receive the pilot's call.

In the excerpt below, the VTS operator reprimands *MPV 9* for calling up frequently. *MPV 9* is a local multipurpose vessel and not deemed a worthy recipient of the same respect accorded to international merchant vessels. The utterance of the VTSO downgrades *MPV9* and portrays it as an irritating frequent caller on the VHF.

Example 7.14: VTS & *MPV9*; *'don't bother repeatedly'*

3869. **MPV9 –** VTS, VTS, MPV nine
3870. **MPV9 –** VTS, VTS, MPV nine
3871. **VTS –** MPV nine bolo. ghadi ghadi tang mat karo (translation – MPV 9 speak. Don't bother repeatedly)

In the following excerpt pilot M 16 is in the process of providing post pilot boarding information to the VTS operator, when the conversation is interrupted in line 4824 by *MPV 7*. The VTS operator sternly reprimands *MPV 7* (line 4825) for interrupting when the pilot was relaying an important message. The VTS operator further went on to add that *MPV 7* had negated the channel, implying that the very purpose of the VHF was defeated when the likes of *MPV 7* did not respect an important on-going communication and interrupted it.

Example 7.15: VTS, Pilot M16 and *MPV 7*; reprimand for interrupting

4817. **M16 –** VTS, pilot M sixteen
4818. **VTS –** M sixteen, VTS
4819. **VTS –** M sixteen , VTS
4820. **M16 –** yeah VTS
4821. **M16 –** VTS, pilot M sixteen. How do you read me?
4822. **VTS –** Pilot M sixteen, loud and clear
4823. **M16 –** Okay *Albatross 11* boarded one eight three five, lock clear one nine zero zero, from one dock lock going to sea. Port All Clear number one five six seven dated (omitted) for (omitted)
4824. **MPV6 –** Paas karke bahar jaane wala dredger kaunsa hain MPV one, MPV seven calling (translation – Which dredger is going out? MPV one, MPV seven calling.)
4825. **VTS –** MPV seven ruko, tumko sunayi nahin de raha pilot message de raha hain, tum idhar channel ko negate karke rakha hain (translation – MPV seven, stop. Can't you hear that the pilot is giving a message? You have negated the channel.)
4826. **VTS –** Pilot M sixteen, VTS
4827. **M16 –** Yeah VTS, boarded one eight three five, lock clear one nine zero zero. Port All Clear number one five six seven dated (omitted) for (omitted)

The reprimand is used (example 7.15) to sanction the breach of the moral order of VHF interaction. The reprimand displays the anger and authority of the VTSO and serves to downgrade *MPV 7* and re-inscribe port hierarchies that pilots have top priority and small barges and craft, a lower status in the port (see Foucault 1995a; Hutchby 1996a, b). A major purpose served by the reprimand is to reclaim speech rights (turn and floor) for the VTSO (Schegloff 2007). While most of the interruptions on the VHF radio are ignored to move the interaction forward[131], the interruption in this case is emphatically sanctioned as it interrupts an important key communicative stage of post pilot boarding (see chapters 5 and 6). The VTSO perceives the infringement of his VHF territorial rights (Goffman 1971, 2010 edition) and accordingly sanctions *MPV 7*. The reprimand is also an example to the other small craft listening in.

At times, the VTS operators are inundated by calls and they discourage a vessel from calling repeatedly. To manage the radio traffic, they say that once they receive the programme from the office they will themselves call the ships so there is no need for a ship to continuously call them. Line 5447 in the example below is to be compared and contrasted with the strong reprimand given to small craft (example 7.15). Since international merchant ships have a higher status than small local craft in the channel, the VTS operator does not use harsh words, but an instruction in line 5447 to, *'maintain channel one five ..... and do not keep calling'*.

Example 7.16: VTS and Dreamy Sky; *"do not keep calling"*

5439. **DS –** MahaDevi VTS, MahaDevi VTS, motor tanker *Dreamy Sky* please come in
5440. **VTS** *Dreamy Sky, Dreamy Sky*, VTS. Go ahead
5441. **DS –** Sir good evening to you. Sir any information about us?
5442. (5442-5446) lines omitted
→ 5447. **VTS –** You just stand by. You maintain channel one five. If there is a program we will inform you. Maintain channel one five and do not keep calling.

At times the pilots rebuke the VTS operators which serves to re-affirm port hierarchies and is detrimental to the morale of the VTS operators. The public nature of the reprimands and rebukes can cause embarrassment or loss of face in some cultures like Japanese and Filipino (see Ho 1976; Rutten 2007; Lin and Yamaguchi 2011). Lewis (2006) finds that Indians *'don't easily lose face as failures tend to be attributed to circumstances rather than to people'*. In my

[131] Dealing with interruptions is discussed in chapter 6, section 6.4.2.

study, the VTS operators in the Indian port spoke of irritation, exasperation and stress when at the receiving end of reprimands / rebukes.

Kajal 20, a dredger had reported a fault earlier, saying that it had a technical glitch. In the example below, the VTS operator asked *Kajal 20* to move towards the main channel as he had observed *Kajal 20* getting close to the vessel *Nala* anchored at number 2 anchorage.

Example 7.17: VTS and *Kajal Twenty*; background for pilot reprimand to VTSO

7497. **VTS –** *Kajal twenty*, *Kajal twenty*, VTS
7498. **K20 –** VTS, *Kajal twenty*
7499. (7499-7502) lines omitted
7503. **VTS –** No, now presently, you are near anchorage two, you move towards main channel. Come to North
7504. (7504-7505) lines omitted
7506. **VTS –** *Kajal twenty*, MahaDevi VTS
7507. Line omitted
7508. **K20 –** MahaDevi VTS, MahaDevi VTS, *Kajal twenty*
7509. **VTS –** *Kajal two zero*, you keep clear the anchor vessel *Nala*. Keep clear. Come to North
7510. **K20 –** vessel okay sir my position is zero two seven degree, nine six decimal nine nine minutes West uuh North and one two three degree eight one decimal six six East, sir
7511. **VTS –** *Kajal two zero*, pilot on-board?
7512. **K20 –** Pilot on board Sir
7513. **VTS –** Call pilot
7514. **K20 –** Okay Sir

On not receiving a satisfactory answer from *Kajal 20* (line 7510), the VTS operator asked the seafarer to call the pilot who was on-board at the time. In line 7532 of the example below (7.18), the VTS operator disassociated the pilot from the vessel and made an impersonal detached factual observation that the ship was near number 2 anchorage point. The pilot took it as a personal affront and said in line 7535 that he was on-board the vessel implying that as a pilot he knew what he was doing and the VTSO had been audacious in calling him. The VTS operator says, 'No' thrice in the beginning of his response to the pilot (line 7536) implying that he was not questioning the presence of the pilot on-board but had made the call in the interest of vessel safety. The VTS operator then justified the call that the ship had some problems. The pilot responded (line 7537) saying that there was a problem with the dredging but not with the steering of the ship. The VTS operator agreed with the pilot (line 7538) but still observed that the ship was close to *Nala* anchored at number 2 anchorage to which the pilot's response was incomprehensible muttering and the audio could catch the phrase *'a waste of time'* before he went off air. The utterances of the senior pilot served to downgrade the role, authority and expertise of the VTS operator. The pilot asks the rhetorical question in a sarcastic tone (7535) whereby the pilot regards the very act of the VTSO's call as being unnecessary. The pilot implies that he is on board, thereby the safety of the craft is assured and the call from the VTS is supercilious and unwarranted. The pilot's utterances in example 7.18 serve to re–inscribe port hierarchies and re–confirm the lower status of the VTS in the port.

Example 7.18: VTS and Pilot M4; downgrading the VTS

7531. **M4 –** VTS, M four
7532. **VTS –** Good morning sir, *Kajal twenty* near anchorage two
7533. **M4** – (disturbance)
7534. **VTS –** *Kajal, Kajal twenty* near number two anchorage point
7535. **M4 –** Yeah I, I am on *Kajal twenty*, Na? (Translation – 'No?')
7536. **VTS –** No, no, no, she is some, there are some problems. It's near anchorage two
7537. **M4 –** Yeah, yeah, but problem is with the dredging not with the steering
7538. **VTS –** That is correct but she is close to the anchored vessel near number two *Nala*
7539. **M4 –** (incomprehensible muttering) °waste of time°

The pilot made it difficult for the VTS operator to stand his ground, however, the VTS operator continued with his observation that *Kajal 20* was close to *Nala* at number two anchorage. The public downgrading of VTS operators highlights the precedence of social imperatives over operational considerations. Should the VTS operators choose to remain silent in front of pilots and should anything untoward happen, then the office of the VTS would be the first to come under scrutiny. Poor working attitudes between pilots and VTS operators have been identified as a contributory cause in accidents in shipping (SAIB 2010). The Swedish Accident Investigation Board had found a *'sour attitude'* between the pilots and the VTS operators as one of the major contributory factors to the grounding of the *Stena Danica* in Gothenburg (SAIB 2010, cited in Brodje et al. 2013). The report also found the absence of *'corrective communications from the VTS'* as a contributory factor. On the one hand is the accident investigation board that opines the VTS should do more in such instances, while on the other are pilots who can resent such utterances of the VTS operators, and the lack of clarity regarding the legal liability of VHF utterances is unhelpful. The VTSOs seem to be caught in a catch 22 situation – *'damned if you do and damned if you don't'*. Brodje et al. (2013) explored 'non-technical miscommunication' in VTS operation using simulation and found that –

> The VTSOs, even though they are well aware of crucial events in the fairway, at times choose not to inform navigating officers or pilots of these safety aspects apart from when subject to protocol (ibid, P. 347)

Brodje et al. (2013) found two major contributory factors in such miscommunication. The first is the *anticipation of negative attitudes between working groups participating in the VTS system* and the second is the *lack of sufficient regulation with regard to the role and responsibilities of VTSOs.* In January 2011, a collision took place between the merchant vessel *MV Nordlake* and the Indian naval warship *INS Vindhyagiri*, which led to the sinking of the naval frigate following a fire and ingress of water. The official report is pending, however an extract from a newspaper article quotes a former port official mentioning the VTS and that it should have become involved and cleared the confusion.

> A former port official said, *"The Vessel Traffic Management System, which monitors the movement of all ships from port, should have jumped in and sorted out the confusion. A lot of streamlining of traffic is needed on the Mumbai coast. MBPT should try to strictly enforced lane discipline"* (Tiwary 2011).

This ties in with example 7.18 (page 259) when the pilot made it difficult for the VTS operator to stand his ground when the latter had made an observation that the pilot's vessel was close to an anchored vessel. The pilot took the VTS operator's observation as a personal affront and insult. This attitude is detrimental to promoting safety in the port. If a VTS operator speaks, he runs the risk of coming across as supercilious and if he chooses to stay silent in the future in a close quarter situation then that would serve to introduce risk into the system (see Nuutinen et al., 2007).

VTS operators are not passive recipients of reprimands/rebukes suggestive of hierarchy, power and status. They do not retaliate against the seniors on the marine radio but they react to the rebukes in their different ways. The 'getting back' reactions are in the shaking of the hand set of one VTS operator who says, *"Get off the VHF damn it"*[132]. It is in the comment of another, *"we're piloting the pilots"*[133]. Getting back is in the words of one who wants his name to be mentioned in the research – *"likho likho, mera naam likho"* (transliteration), *"Write, write, write my name"* (translation).

> The VTS operator wanted me to mention his name, probably because he was retiring shortly and felt that nothing would come of mentioning his name at this juncture of his

[132] So as to say, "It is mine. Give it back to me".

[133] Remote Pilotage is not carried out in the port and this statement made by the VTS supervisor implies that the work of the VTS is very important and the pilots depend upon the VTS (field note, 24 Dec 2010).

> life and career. He appeared confrontational. It felt as if the VTS operator perceived himself to be pushed in a corner and getting his name mentioned in my research was his way of pushing back or taking on his bosses so to speak (field note, 23 Dec 2010).

Even though the research participant wanted his name to be mentioned, it was in the ethical interests (discussed in chapter 3) of the research to protect his identity. Another VTS operator said that he had other options available to him apart from serving in the VTS office. He still had his Continuous Discharge Certificate (CDC) and felt that if things continued as they were, or if he did not like the increasing stress and pressure, he would have his CDC stamped and revalidated and head back to sea.

> Apna CDC liya, usko stamp karvaya aur vapas sea pe chal diye
> I'll take my CDC, get it stamped and go back to sea (translation) (Interview VTSO 1)

Reprimands are utilised by the VTS operators to sanction perceived territorial offences, reclaim speech rights and the floor; serve as an example to other listeners to desist from crowding the radio channel. VTS operators use reprimands to perform anger and irritation at callers who they believe are causing a hindrance to their work. Pilots use reprimands to downgrade the VTS and re-inscribe hierarchy on the VHF radio. Reprimands and public rebukes do not make it an ideal work environment for the VTS. Sub-section 7.5.3 discusses power, rank and status on the VHF.

7.5.3 Power, Rank and Status

Power, rank and status are performed on the port radio. The pilot on-board the merchant ship *Ocean Pioneer* continues to address himself as Harbour Control instead of his individual pilot code thereby invoking the power of his designation. He is addressed by the VTS operators and other pilots in the harbour as DMHS[134] – Dock Master Harbour Station. When a VTS operator mentioned his initials as AKG[135] for Anand Kumar Garg, the pilot he was communicating with, acknowledged only after DMHS was mentioned. Irritated by the boss's interference and public rebuke, the VTS operator downplayed the senior pilot by using his initials but the silence of the other pilot in the conversation upheld the rank and status of his senior by not responding until the appropriate designation of DMHS was mentioned thereby re-inscribing the port hierarchies.

[134] Anonymised
[135] Anonymised

Example 7.19: VTS, Pilot SP 10 & absent DMHS; upholding the designation
1672. **SP10 –** VTS, SP ten. Which is the outbound ship now from MahaDevi?
1673. **VTS –** *Ocean pioneer*, going out
1674. **SP10 –** Who, who is the pilot on-board?
1675. **VTS –** AKG (1.0) DMHS
1676. **SP10 –** Okay DMHS on board

Noteworthy in example 7.19 is that the order of the VHF interaction requires information to be repeated (see the 'confirmatory form of talk' in Bailey et al. (2006) and the 'read back' in Froholdt (2011c)) and the pilot repeated the designation of his superior to acknowledge his higher authority but ignored the initials of his senior.

Rank, power and status are played out on the VHF and hierarchies are performed and re-inscribed publicly on the port radio. The VHF has a panoptic dimension as the utterances can be heard and monitored by all and the speaker can be held responsible and accountable. In the example below, the Dock Master calls the VTS on the public radio and asks if anyone in the VTS had asked a pilot from the neighbouring Sagar port to call him which the VTS operator denied doing so. The interaction is out of place for a port and more in line with a classroom, where errant schoolboys are asked to own up to something they may or may not have done.

Example 7.20: VTS and Dock Master; an awkward call
3079. **HC –** VTS, Harbour Control
3080. **VTS –** Harbour control, VTS
→3081. **HC –** Yeah on my behalf have you, told SP two to call me?
→3082. **VTS –** No, we have not informed SP two
→3083. **HC –** From VTMS anybody has told Sagar port control?
→3084. **VTS –** No(.) no(.) no(.) one here has informed Sagar port control

The VTS operator uses the pronoun, 'we' in line 3 to refer to his colleagues – the membership category of VTS operators (Sacks 1989, 1992) to highlight that none of them are responsible for the errant call.

The context of the following example (7.21) is that in the morning the VTS had received a non-standard query from *Reema* to conduct a wet test on their ROV[136]. Initially the VTS operator could not comprehend what an ROV was and required explanation. Subsequently, the VTS operator gave permission to conduct the test up to the waterline and not beyond that. The

[136] Remote Operated Vehicle (ROV)

Seafarer said that he needed permission beyond the waterline to submerge the ROV for 10 to 15 minutes and check the lines and cameras before picking it up and the VTS operator gave him permission. There is a possibility that the VTS operator gave permission without fully appreciating what was being asked of him. At that time he had been busy filling the logs while at the same time trying to talk to *Reema*. In the evening the Dock Master got back to the VTS in connection with the permission given to *Reema*. Harbour control chose the main VHF for communication. In line 7542 the Dock Master wanted to know who gave permission for the lowering of the ROV. The VTS operator on the radio was not the one who had spoken to *Reema* in the morning. On hearing this, the VTS operator who had spoken to the vessel, took ownership of the call, immediately went on air and said in line 7543 that the permission was only ‘above water level and not beyond that’. The VTS operator justified his permission as ‘reasonable’ since it was only ‘up to water level’ and attempted to come across as justified and above blame.

Example 7.21: VTS and the Dock Master; about Reema

7540. **HC –** VTS, Harbour Control.
7541. **VTSO 1 –** Harbour Control, VTS
7542. **HC –** Ramesh, who gave permission for lowering ROV to the water level?
7543. **VTSO 2 –** Harbour control, VTS. She was allowed before above water level not beyond that
7544. **HC –** Okay but at least inform me, no? She is in now, anyway, just phone me up, I’ll tell you what has happened now.
7545. **VTSO 2 –** Now she was asking permission again for this testing
7546. **HC –** Sumit just phone me up. I’ll tell you the problem now.
7547. **VTS –** Okay

There was a problem and something had happened in connection with the ROV wet test and Harbour Control wanted to talk further on the phone in lines 7544 and 7546. What is noteworthy here is that a part of the conversation is undertaken on the main VHF channel when it suits the Dock Master, and when he feels like it, he wants to speak on the phone for privacy. The next day it was revealed that the ROV had been lost in the water and the assistance of divers was sought to retrieve it. It was not found until the end of my fieldwork in the port.

Asymmetry in the port comes across on the VHF radio with the performance of hierarchy – the display of authority, the use of ‘Sir / Sahib’, delaying response to small craft, permitting small craft to cross the channel after confirming the channel is clear or withholding permission, if required. Asymmetry is also highlighted by the public rebukes and reprimands and the performance of power, rank and status on the radio.

7.6 Unequal Distribution of Knowledge

There is unequal distribution of knowledge in the port. The VTS office has access to the input received from radars and the AIS which are super imposed on electronic charts of the harbour. The information available to them is electronically updated in real-time. They also receive information pertaining to ship movements from the port office. It can safely be assumed that the VTS would have most of the answers, if not all, pertaining to ship movements. However, at times, this may not be the case. In example 7.3, p. 247-248 under the theme of ‘knowledge displays, I discussed a senior pilot cum port official who had some information available with him that the VTS did not. When the ship asked for information, the VTS replied that it had not received any instructions while the senior port official asked the ship to change the channel to talk to him. The authority of the VTS is downgraded if they are perceived as not having the information expected of them.

In a similar vein, in example 7.22 below, a ship *Meera* called the VTS for information pertaining to its berthing, to which the VTS operators replied in line 60 that there was no booking and he would check. Immediately the Dock Master came on air in line 61 and told the VTS operator to check again as there was a booking for the ship. The Dock Master was aware of this but the VTSO was not. The confirmed bookings are provided by the office of the Dock Master to the VTS, but somehow *Meera* had been missed.

Example 7.22: VTS, the Dock Master and *Meera*

60.**VTS –** *Meera*, no booking I'll just check

61.**HC –** Vapas check karo booking hai (transliteration)
Check again. There is a booking (translation)

Yeh Meera ka booking hai. DMHS bol raha hai. Diya nahi idhar (VTSO on telephone to Control Station) (see field note below for translation).

The VTS operator was caught off-guard and immediately made a call to the control office regarding the booking for *Meera*. He said, *"There is a booking for Meera. The Dock Master is saying. But it wasn't given here"* (translation). He appeared momentarily nonplussed and irritated that he did not come across as well informed and on top of things. Later he turned to me and the other VTSO present and added that there was a lot of stress in their job and at times they felt nervous. He further added that the Dock Master wanted to expedite everything on the VHF (field note, 21 Dec 2010).

Role identities become fuzzy and are undermined when a senior officer cum pilot of the port takes on the role of the VTS as discussed previously (section 7.4.1). The Dock Master by virtue of his designation, has access to the information of the day's movements (also see section 7.4.2 on knowledge displays) which in turn can be used to provide Information Service (INS) to ships in the vicinity from on board the vessel that he is piloting. In the extract below a vessel named *Haze 123* calls the MahaDevi VTS. The pilot on-board another vessel *Pioneer* answers. This senior pilot is also the Dock Master and possesses knowledge of traffic movement for the day. In lines 1579 and 1580, *Haze 123* again calls the MahaDevi VTS and the pilot on board *Pioneer* in line 1581 asks to speak to the pilot of *Haze 123,* to which the seafarer answers in line 1582 that the pilot was down for lunch and that he needed to understand the intentions of the war ship on his port side (*Jyot*). In line 1583, the pilot of Pioneer takes an extended turn and explains that the war ship is going for docking and speaks for another vessel *Bird*, outbound and on the port bow of *Haze 123* at the time of the interaction, that *Bird* would pass *Haze 123* red to red and thereafter goes on to confirm that *Pioneer* itself would pass with *Haze 123* red to red. The pilot in the extracts below has taken on the role of the VTS. The moment he went on air, the VTS did not step in as he was a senior official and also because only one entity can speak at any time on the VHF and the pilot had been the first to hog the busy airwaves.

Example 7.23: The Dock Master and Haze

1577. **Haze 123 –** VTS, *Haze 123*
1578. **Pilot of Ocean Pioneer/DM –** *Haze 123* this is *Ocean Pioneer* out from number one dock, how do you read?
1579. **Haze 123 –**VTS *Haze 123*, come in
1580. **Haze 123 –**VTS *Haze 123*, come in
1581. **Pilot of Pioneer/DM –** *Haze 123* can I speak to your pilot? Over
1582. **Haze 123 –** Pilot is down for lunch. I, I need to know the intentions of this warship on my port side
1583. **Pilot of Pioneer/DM –** *Haze 123* he is also going, he is docking into number one dock and you can see one vessel outbound from on your port bow she will pass red to red and vessel on your port beam is docking into number one dock. Over
1584. **Haze 123 –** Roger understood okay, I, loud and clear, Okay understood
1585. **Pilot of Pioneer/DM –** and this is the pilot on the outbound ship from number one dock. Thank you
1586. **Haze 123 –** okay bye bye
1587. **Pilot of Pioneer/DM –** Okay and confirm we will be passing red to red, Thank you
1588. **Pilot on-board Haze 123 –** Roger Sir we will be passing red to red with you thank you

At the time of the interaction *Haze 123, Jyot* and *Bird* were in the main channel and *Ocean Pioneer* was in the number one dock channel and was outbound making its way to the main channel. From this inner location, the Dock Master was speaking to *Haze 123* about the intentions of the warship *Jyot* and how the vessel *Bird* would pass *Haze 123*. The Pilot was not interrupted by either the VTS or any of the two vessels *Jyot* or *Bird* whom the Pilot had been referring to. Even though the pilot was well versed with the traffic schedule for the day and the intentions of various vessels in the vicinity, his talk comes across as presumptuous and talking on behalf of others could jeopardise safety. At first, *Haze 123* had ignored the pilot in lines 1579 and 1580 and continued to call the VTS. However, since the pilot had answered immediately and wanted to speak to the pilot of *Haze 123*, the vessel entered into conversation with him.

> There was much amusement in the VTS office on hearing the pilot speak about the intentions of other vessels to Haze 123. Even Haze 123 appeared surprised. The VTS couldn't get a word in edgeways and the pilot had already done all the talking (field note, 23 Dec 2010).

The palpable rank, status and occupational hierarchy find their way to the public medium of the marine radio, which should ideally be a neutral space from where professional interaction pertaining to maritime safety is undertaken. The integral presence of hierarchy on the VHF radio begs the question, why the presence of rank, status and hierarchy is an integral, taken-for-granted and acceptable part of the social interaction on the port radio? The answer lies in the occupational hierarchy in the maritime tradition and the hierarchical Indian society, explored in section 7.7.

7.7 Occupational Hierarchy and the Unequal Indian Society

To ground the asymmetry in the port, section 7.7 provides a brief overview of the occupational hierarchy in the maritime tradition (7.7.1) and the inherently hierarchical Indian society (7.7.2).

7.7.1 Occupational Hierarchy in the Maritime Tradition

My research was conducted in a port VTS office and not on-board a merchant ship, however, I argue that the hierarchy prevalent in merchant shipping is also present in the port. The port caters to international merchant ships; the VTS operators have seagoing experience and the pilots have Master Mariner licenses implying that the pilots have moved from a seagoing career to providing pilotage services. The VTS operators, pilots and the Dock Master, all work in the same industry and in this sense, hierarchy comes ashore. In this section, I allude to the hierarchical maritime industry to discuss why rank, status and hierarchy feature on the port radio and why it is an integral part of the VHF interaction.

Merchant shipping is traditionally hierarchical. Crew on board are divided by virtue of their ranks (officers and ratings), departments (engine and deck) and at times even the physical recreational spaces on-board like separate mess rooms (Kahveci et al. 2001; Alderton et al. 2004). A Master in command on-board a merchant ship is the overall in-charge and wields complete authority. Captains on board modern merchant ships are in charge of the safety and security of the crew, vessel, cargo operations and environmental compliance. Traditionally, captains have had overriding authority on board and insubordination is dealt with harshly, such as with the capture and trial of the mutineers on board HMS Bounty in 1792, 3 years after the mutiny in Tahiti (Royal-Naval-Museum 2002).

One researcher (Sampson and Thomas 2003) experienced the authority of the captain first hand. She writes of a time aboard a ship where she was conducting fieldwork, and the captain lost patience and derogatorily referred to her as a ‘student’ and made insinuations that she was from the union. She found herself shaking with anger and the captain also ordered the crew not to sit and eat with her, effectively isolating her for the duration of the rest of her fieldwork.

The authority and the powers of captains have changed over the centuries. A juxtaposition of the hierarchical Indian society with the maritime tradition helps understand the life world of the VTS operators. The VTS operators belong to the (unequal) Indian society as well as to the maritime tradition. Even though there may be no caste system in operation in the port, occupational hierarchy is performed on the marine radio. Hierarchy in the port is not aligned on the basis of caste but on the basis of rank and status[137]. The prevalence of rank, status and hierarchy and its acceptance is explained in part by sub sections 7.7.1 and 7.7.2 which taken together, serve to situate the Indian VTS operators in the modern world port.

7.7.2 The Unequal Indian Society

While there is no caste system in operation in the port; I refer to it, to contextualise the presence of inequality in India. The Indian society by virtue of its largest Hindu group has been known for the caste system, its hierarchical nature and the segregation it engenders. The Indian government promotes, 'unity in diversity' to foster unity, celebrate the rich diversity of India

[137] Rank and status are differentiated on the basis of the superior training and remuneration of the senior pilots on one hand and the low level of training, less remuneration and the clerical grade of the VTS operators on the other.

and counter divisive segregation through advertisements. One such advertising jingle is reproduced below.

Hind desh ke niwasi sabhi jana ek hai; rang, roop, vesh, bhasha, chahe anek hai
Bela, Gulab, Juhi, Champa, Chameli; phool hai anek kintu mala phir ek hai (transliteration)
(DoorDarshan – Indian State TV advertisement jingle)

All the citizens of India are united; colour, form, clothing and language may be different
Rose, Plumeria, Jasmine; the flowers may be different but the garland is one (translation)

India, with a population of over 1.2 billion (India-Census 2011), is home to several ethnic and racial groups, religions and languages. The diversity in India is astonishing and democratically promoting unity in diversity strives to keep the nation of 1.2 billion together. Diversity is a positive; however the divisions/fissures in the society pose a threat to the social fabric of the country in the form of caste and/or religious riots. The Indian government officially recognises Scheduled castes (SC formerly Untouchables, *Shudras*, *Dalits* and *Chamars*) (Khare 1984; Verma 2008; Judge 2012), Scheduled Tribes (ST) and Other Backward Classess (OBCs) and to bring them at par with the rest of the society provides reservation quotas in education and job opportunities (Mathur 2004).

Caste is integral to the Indian society and serves to divide people along its lines. Sharma (2012) argues if there is a 'caste system' in India or if there is just the concept of 'caste' labels. He argues that performing caste as a means of social control is not so visible in modern urban India and caste is *'elusive to those who have distanced themselves from their social and cultural roots'* but *'caste is enduring'* for those in villages and small towns. This is in line with the student's personal life experience of never having experienced the caste system while growing up in urban India, largely due to an insulated urban upbringing and access to education facilities and employment opportunities.

The ancient Vedic concept of Brahmins, anchoring the pure top and the pollutant Untouchables, anchoring the bottom (Borgstrom 1977; Dumont 1980) is untenable in 21st century urban India (Appadurai 1986; Desai and Dubey 2011; Sharma 2012). Beteille (1987) speaks of Dumont's (1980) work, including the seminal 'Homo Hierarchicus: The Caste System and its Implications' and finds that Dumont's earlier work sits uneasily with modern India. Even though the caste system may not be that visible/tenable and its existence may be questioned in urban India, it is very much a part of Indian society.

The Indian VTS operators come from the hierarchical Indian society and work in the hierarchical maritime industry. This section is not intended as a digression about the caste system and its ills. Rather, it is included to contextualize the social fabric of the society of which the VTS operators are a part, and to offer as an explanation as to why rank, status and hierarchy feature on the marine radio.

7.8 Conclusion

Micropolitics of port communication is identified as a social and organisational challenge in the work of VTS operators and is treated in-depth in this chapter, which answers the following research question –

- What are the challenges, if any, in the work of VTS operators?

The inadequacy of technological support available to the VTS operators was a challenge discussed in chapter 4, while in this chapter I have explored the micro-politics of port communication and highlighted its impact on the performance of the institutional role of the VTS and the accomplishment of their work. I have explored asymmetry in the port, hierarchy, rank, power, status, reprimands, the unequal distribution of knowledge, knowledge displays, delegation of ancillary work and transgression of air space and how these highlight the undercurrents of the micro politics of port communication. I have juxtaposed the Indian society with the maritime tradition to unpack, why this is prevalent/acceptable/taken for granted in the Indian world port. This chapter is an exploration of the micro-politics and highlights, how in its present form, it is utilised to accomplish work and can also hinder safety.

The high degree of internal communication on the marine VHF radio makes its presence noticed by the transgression of the VTS air space by the Dock Master; knowledge displays by the Dock Master as well as the on-air delegation of ancillary work by the Dock Master and the senior ranked pilots. Dealing with internal communication on the VHF adds to the stress of the VTS operators. The public dimension of the internal communication serves to make the role identities fuzzy and downgrades the VTS and brings into question the very competence of the VTS operators and affects their morale. The unequal distribution of knowledge also makes its way to the port radio; when there is a gap in communication and the VTS has not been updated regarding the latest traffic information available with the Dock Master's office, the VTS comes across as ill-informed in front of all the listeners attuned to the port radio.

Asymmetry on the port radio is highlighted by the performance of hierarchy, the reprimands and the performance of power, rank and status. The Dock Master and the pilots are higher ranked than the VTS, however the VTS is addressed as 'Sir'/'Sahib' by some seafarers and small local craft in recognition of the higher status they accord to the VTS. Hierarchy is an accountable feature of VTS work and is performed and accomplished on the port radio by the VTS and the Dock Master and the pilots. The display of hierarchy and authority is utilised by the VTS to accomplish institutional work. The VTS operators delay responding to small craft to manage the interaction with other vessels that have priority, to moderate on-air traffic of radio calls. The VTS has the authority to withhold permission to sail, and exercise it, when required to manage the safe flow of traffic in the main channel, ensuring' control over traffic in the channel (for asymmetry between institution and client, see Ten-Have 1991; for asymmetry on talk radio, see Hutchby 1996a).

Reprimands perform several functions; they help to perform authority, re-inscribe port hierarchies, reclaim speech rights for the VTS (turn and floor), downgrade the reprimanded entity, serve as an exemplary rebuke to listeners to desist from behaviour similar to the reprimanded entity and exercise control over marine traffic. Both, reprimands and the performance of hierarchy are utilised by the VTS operators in accomplishing institutional work.

This chapter is primarily concerned with the micro politics of port communication and how the internal politics is made available to the large unseen but attuned listening audience and the consequence of it for the VTS operators. I argue that given the palpable hierarchy, it is difficult for the VTS operator to intervene when two higher ranked entities are talking (see example 7.18, page 259). In a high profile accident, a pilot was on board *MV Nordlake* when the collision between it and the Indian naval warship *INS Vindhyagiri* took place in 2011. Both the pilot and the naval officer on board the warship are higher in rank and status to the VTS operator. The official report pertaining to the accident is awaited, however the VTS operator may not think that it is his place to interrupt and talk (also see Brodje et al., 2013) when two higher ranked officials are talking. Not interrupting can be detrimental to navigational safety as safety is not the sole responsibility of any one entity – it is a complex joint responsibility of the port trust, the VTS and all port users.

My study is conducted in a port in India and reflects the inequality and palpable hierarchy that is both at home in Indian society and integral to the maritime tradition. Subtle (diffused) undercurrents of office politics and re-inscription of the rank, status and hierarchy take place on the marine radio. At first glance, the on-air broadcast of internal office politics seems out of place in a professional 21st-century international world port. However, contextualising it in the larger Indian society and the maritime tradition helps understand that rank, status and hierarchy are not out of place but rather very much a part of the social fabric of the port itself. Caution is to be exercised here as the hierarchies in the port are occupationally aligned on the basis of rank, status, training and role in the port operations and are not aligned on the basis of the caste system. Even though the hierarchies in the port have nothing to do with the caste system, literature on this subject same is referred to, in order to contextualise the inequalities in the highly stratified / divided / unequal Indian society.

It has been demonstrated that on–air internal communication, transgression of air space, fuzzy role identities, knowledge displays, delegation of ancillary work and inappropriate content of communication can downgrade the role of the VTS and irritate, belittle and embarrass the VTS operators. This is not good for the morale of the VTS operators especially since they have to monitor a busy waterway of the country. The micro politics of port communication is discussed at length in this chapter as it emerged as a challenge and a key theme on the VHF intertwined with the institutional communicative work practices that help achieve navigation, and was negatively affecting the VTS operators of MahaDevi.

The findings from empirical chapters (4, 5, 6& 7) were discussed in relation to the literature within each of the chapters. Therefore to avoid redundancy, a separate 'Discussions' chapter is not included in the thesis. Chapter 8, the 'Conclusions' chapter, follows which revisits the key sociological and maritime research findings. The chapter discusses the limitations of the research, makes suggestions for possible future research endeavours, highlights the contributions of the study, makes recommendations and concludes the study.

Chapter 8 Conclusions

This thesis explored the in situ work of VTS operators and the challenges in their work in line with ethnomethodological studies of work (Rawls 2008), interactionism and related ideas. The eclectic approach to social theory enabled the in-depth exploration of work and technology in the VTS – a centre of coordination (Suchman 1987) without sacrificing the breadth of the analysis and illumined the port interaction order (Goffman 1983) in terms of the constitutive and rule governed orders (Rawls 1987, 1989b; Rawls 2009).

8.1 Introduction

The individual empirical chapters stand alone in their own right as subplots (chapters 4, 5, 6 and 7), and this final chapter draws the strands from the findings chapters together to unify the thesis' narrative and conclude the thesis. This chapter revisits the findings of the thesis and discusses and summarises them in section 8.2. Research limitations are discussed in section 8.3. Suggestions for further research are made in section 8.4. The contributions of the thesis are enumerated in section 8.5 and section 8.6 makes recommendations and concludes the study.

8.2 Revisiting the Findings

The research findings have been discussed and reflected upon in relation to the literature within the findings chapters (4, 5, 6 and 7). Figure 6.7 on page 232 provides a snapshot of the key findings and this section presents a summary of the findings together with a brief discussion. All three research questions and sub-questions have been answered in the thesis. Table 8.1 below, identifies the thesis' chapters and the research questions answered therein.

Table 8. 1: Thesis' chapters and research questions answered

S.No.	Research question	Chapter(s)
1	What is the work of VTS operators?	1, 4
2	How do they work? • How is vessel traffic managed? - What are the practices, procedures and activities that facilitate vessel traffic management? • How is harbour/channel navigation achieved interactionally? - What is said, when, to whom, why, how and to what effect in furtherance of the communicative management and accomplishment of harbour/channel navigation?	5, 6
3	What are the challenges, if any, in the work of VTS operators?	4, 7

The key sociological findings of the thesis pertain to the fine grained, artful, in situ accomplishment of harbour/channel navigation (Garfinkel 2006) and the insights into the port interaction order (Goffman 1967; 1983; Rawls 1987; Helm et al. 1989) afforded by the eclectic approach to social theory. The broad approach to social theory enabled me to draw upon ethnomethodology, interactionism and related ideas (see Rawls 1989a, b) and move beyond the dichotomy between individual and structure (see Giddens 1984) and illumine the interaction order of the port, where meaning, self and order are largely achieved interactionally on the VHF through local orders. The institutional self (of VTS operators, Dock Master and pilots), meaning and practical action of members (VHF interaction, including at key communicative stages and evasive manoeuvers) are products of their interactional commitment (Rawls 2009). The interactional commitment shapes the emergence and accomplishment of the institutional self; the intelligibility, indexicality and reflexivity of meaning and the accountability of social action in the port. Such an approach synthesises the interactionist work of Goffman (1959; 1961; 1963; 1967; 1971; 1983) with Garfinkel's (1967; 2002; 2006) local order production and its relationship to formal rules and institutional constraints, with Sacks' (1989; 1992) and Schegloff's (1991; 1992; 2007) work on language (see Rawls 1987; 1989b; 2009).

Rawls (1989b) has proposed that the study of social order should consider it as composed of constitutive and institutional orders – its two distinct forms. The order on the port radio is both constitutive and institutional. The local constitutive order is evident in the accomplishment of the vessel trajectories via the key communicative stages and associated activities, while the institutional rule-governed order, which requires accountability can be gauged through the observation of the maintenance of logs by the VTS operators, wherein they take down details while speaking to ships. For the port authority, these logs represent the work of the VTS operator during his shift and the VTS operator is accountable for the completeness and accuracy of the logs. Just as formal databases collide with the informal ad-hoc logic of police work (Benson 1993), similarly the logs are not constitutive of VTS work. Institutional order is also accessible via *vocabularies of motive* (Mills 1940) offered by the VTS operators; in one instance, after the VTSO gave explicit instructions to a vessel regarding the course to steer; he turned to me and said, "*We are not supposed to give any particular course because we are not knowing whether there is a fishing boat or anything is there or not. So we are forced to give a course, because she is not bothered to maintain the course"* (field note, 21 Dec 2010. See p. 123-124) for full field note). The situated action of the VTSO and his subsequent explanation highlights a tension between the rule he is supposed to follow and his situated/emic act, which he undertook and justified in the interests of safety (also see Suchman 1987). The public dimension and the panoptic environment of the free-to-air broadcast VHF radio ascribes utterances to members and imposes accountability on the members to uphold the inherently moral interactional order. On the basis of my research, I argue that exploring the interaction order as constitutive and institutional is supported by an eclectic approach to social theory and would prove to be elusive otherwise.

Studies of work, *recover* work and make it analysable, together with the artefacts, resources and technology that shape work and help to accomplish it, and enable the study of work as a situated, local, embedded, embodied and contingent accomplishment (see Button 1993c; Button 1993a; Kawatoko 1999; Heath et al. 2000; Heath and Luff 2000d; Heath et al. 2002; Garfinkel 2006; Rawls 2008). My study has analysed the in situ work of VTS operators, together with the VTS Decision Support System and VHF radio technology at their disposal and the running logs (artefacts) that are a part of their work, and the findings are discussed subsequently in this section. *Centres of coordination*, in particular, study the technologically supported cooperation and collaboration between spatially distributed personnel (Heath and Luff 1992; Harper and Hughes 1993b; Suchman 1993; Heath and Luff 2000b) and my study explores the cooperation and collaboration between the VTS operators, seafarers and pilots to accomplish enduring safe traffic movement in the harbour/channel. Studies of work largely utilise ethnomethodology, ethnography and conversation analysis in the conduct of research (Arminen 2001) and my study has utilised these methods in line with the study categories four and five identified by Psathas (1995b), which do not study the structure of talk, but study work as accomplished through talk. The (in)adequacy of technology is analysable in workplace studies (Button and Harper 1993; Heath and Luff 2000a) and my study has found lack of technological support in the work of VTS operators which they work around (discussed subsequently in this section) and the findings can be utilised to design supportive systems (Luff et al. 2000). Studies of institutional talk utilising conversation analysis have revealed the interaction sequences, turn taking mechanisms and speech exchange systems; accomplishment of institutional identity and nuanced knowledge distribution between the participants. My study has utilised conversation analysis to highlight three main sequences on the VHF radio (discussed subsequently in this section), the turn taking and speech exchange system on the port radio and my study has found the performance and accomplishment of institutional identity on the VHF as well as differences in knowledge distribution between the participants (discussed subsequently). Studies of mediated communication highlight the inadequacy of the medium to support *the delicate and systematic processes of interpersonal coordination found in real life* (Heath and Luff 1993, p. 54) and highlight the adaptions carried out by the communicating participants (see Sanders 2003). My study has explored VHF radio communication and found that VTS operators, pilots and seafarers adapt communicative practices to deal with interruptions and when music or profanities are being aired on the marine radio. Chapter-wise summary of the key findings is provided in the remainder of this section.

Chapters 4 on *harbourscapes* and 7 on the *micro-politics of port communication* are closer in focus as they explore the messy clutter in the research, while chapters 5 and 6 dissect through to reveal the ordered communicative management and accomplishment of harbour and channel navigation. The chapters are ordered and presented in the thesis to reveal the enduring achievement/accomplishment of order while being flanked on both sides by chaos, similar to the MahaDevi channel in which the ships move in an orderly fashion but the channel is bound on both sides by innumerable anchored craft. The VTS operators find a way to communicate effectively with other members day-in and day-out to keep traffic moving safely and achieve immortal order in the harbour/channel (see Garfinkel, 2002, 2006).

Chapter 4, the first of the empirical chapters, together with chapter 1 answers the first research question pertaining to the work of VTS operators. Chapter 4 introduced the complex space of the MahaDevi harbour, highlighting its unique sights and sounds inaccessible to the outsider and located the social actors/members in the dynamic scene. Among others, the chapter discussed the work and its organisation in the MahaDevi VTS and answered the first research question about the work of VTS operators. Chapter 1 discussed the generic role and work of VTS operators, while chapter 4 explored the work of MahaDevi VTS in particular. The MahaDevi VTS operators operationalise the traffic schedule received from the office and actively accomplish safe harbour/channel navigation. The VTS operators monitor traffic and talk to the ships on the VHF radio to maintain safe and efficient traffic flows in the channel.

One of the main findings of chapter 4 is that traffic monitoring (on the screens and on the marine radio) is accomplished by the VTS operators and is an accountable feature of their work (Garfinkel 2002, 2006). The subsequent action of the VTS operator in going on air and talking to the concerned vessels, reflects back on the on-going monitoring in the achievement of local order, and praxeological validity lies in the following of instructions by the vessels, which works to accomplish order in the harbour/channel and is *seen by others to work* (Garfinkel, 2002, p. 42).

The knowledge of time (eta and etd) and tide is built into the traffic schedule for the efficient utilisation of port resources (pilots, pilot launches, berths etc.); and the members utilise the structural elements of '*Timescapes'*, namely – *time frame, temporality, timing, tempo, duration* and *sequence* (Adams 2008a) on the VHF to obtain information on vessel movements and place traffic in the harbour/channel, which is an accomplishment and an accountable feature of work. Channel safety is accomplished by facilitating the vessel movements to ensure that the right vessel is at the right place at the right time; and providing and receiving information about the time of vessel movements is accomplished by the members to place traffic in the surrounding area and build a picture of traffic to actively achieve order in harbour/channel navigation.

Placing vessels in the area and positively locating them is utilised by the VTS operators for traffic monitoring and facilitating traffic movement; and by other members, such as pilots and seafarers to navigate safely in the channel and avoid navigational incident. Placing vessels in the channel is achieved by the pilots and seafarers by calling the VTS on the VHF and getting information regarding the concerned vessel. Accurately locating vessels is part of the monitoring function of the VTS, however one finding reveals that the VTS operators are not immediately aware of a vessel's location if the vessel is not plying in the main channel and the VTS operators question the vessel itself regarding its location to expedite work. This is similar to Harper and Randall's (1992) ATC study, in which the ATC's do not go over all the radar blips on the screen to locate the flight, but first consult the flight strip to positively locate the air craft. Ethnomethodological workplace studies recover technology and enable it to take centre stage and be analysed (Button 1993c; Button 1993a; Heath et al. 2000). The lack of knowledge about the vessel's location highlights the lack of technological support available to the VTS operator that ill supports in situ work (see Button and Harper 1993; Heath and Luff 2000a) and also brings to the fore the lack of continuity between shifts in the VTS office. The VTS operators routinely work around the lack of technological support and directly ask questions of ships to place them in the VTS area, which is an accountable feature of VTS work. Ethnomethodological workplace studies enable the in-depth exploration of in situ daily operations and can contribute to the design of technology supportive of work (Luff et al. 2000).

Perceiving a security sensitive vessel and its resolution is accomplished by the VTS operators and therefore an accountable feature of VTS work (Garfinkel 2002). In a similar vein, resolving conflict between the civil port operations and naval operations is undertaken by the civilian VTS operators with the naval control. This has parallels with Harper and Randall's (1992) study of the ATC, in which civilian controllers perceived 'rogue' planes and resolved the situation with their military counterparts as part of their daily work.

The final findings of chapter 4 pertain to dealing with obscenities and melodies aired on the radio, usually late at night, which alter VHF interaction between VTS operators, pilots and seafarers. Dealing with interruptions caused by obscenities and songs is an accomplishment by the members and an accountable feature of institutional interaction on the marine radio. The obscenities are ignored completely by the VTS operators and pilots, and with respect to the songs on the radio, the communicating entities ignore the songs, persevere to communicate and if required, change the channel on the marine radio to complete the required communication.

Chapters 5 and 6 have a similar focus to explore the communicative management and the in situ accomplishment of the safe and efficient movement of marine traffic in the harbour/channel. The vessel trajectories are accomplished by the VTS operators, pilots and seafarers through the key communicative stages and associated activities to keep the marine traffic moving safely, without incident, and are accountable features of VTS work (see figures 5.1, 5.2 and 5.3, p. 151). Each and every key communicative stage of the vessel's trajectory is a fine grained, in situ, situated and embedded accomplishment, which enables marine traffic to be processed for arrival or departure, place and locate the traffic in the harbour/channel and facilitate the monitoring function of VTS (see figure 5.6, p. 182 and figure 5.7, p. 194). The structure of VHF communication at the key communicative stages is geared towards a smooth transfer of information, increasing message uptake and minimising air-time (see table 6.1, p. 208 and figure 6.6, p. 218). The arrivals and departures of vessels are closely coordinated to efficiently utilise port resources and managing delays is accomplished by the VTS operators on the VHF radio by slowing down affected vessels to absorb delay and avoid congestion at the pilot boarding grounds and ensure the safe movement of traffic in the channel.

Placing ships in the channel is crucial for safe navigation and VTS operators facilitate this for shipboard seafarers and pilots by providing information on oncoming traffic movements and painting word-pictures of traffic in the area. Perceiving developing encounter situations, and de-conflicting are accomplished by the VTS operators through directly instructing vessels on how to pass each other and initiating inter-ship interactions regarding passing situations to promote clarity with display of intentions and avoid doubt. De-conflicting developing situations is achieved by pilots by contacting the VTS and getting information on an entity and thereafter contacting the self-same entity to negotiate passing/overtaking/collision avoidance, as the case may be utilising intention displays (Goffman 1971, 2010 edition).

Conversation analysis was utilised in the study to reveal and nuance institutional talk in select instances (Jefferson 1984; Sacks 1989, 1992). The main findings utilising conversation analysis are that the three main sequences on the port VHF radio are ‘summons-response’, ‘question-answer’ and ‘instruction-acknowledgement’ (Schegloff 2007). The non-response of entities is made hearable and they are held accountable to respond and confirm their understanding of the situation and required future course of action; thereby highlighting an inherently moral order on the port radio (Garfinkel 2006). The sequences are accomplished by the members on the port radio and are accountable features of work. Another findings utilising conversation analysis is the lyrical sing-song quality of the summons utterance with rising and falling intonation and extended vowels, which enables the respondent to identify self as the respondent for the next turn and respond appropriately.

Example 8.1: Summons utterance on the VHF
Sea Mermaid –V↑TS, V↑TS, *Sea ↓Merma:id*
VTS – ↑*Sea Merma:id*, ↓VTS

In the turn taking and speech exchange systems on the marine radio, the first turn is self-allocated and the next turn is predetermined and allocated to the identified respondent by the caller. In example 8.1 above, *Sea Mermaid* identifies VTS as the respondent in the VHF call and the next turn is allocated to the VTS (Schegloff 2007). Conversation analysis is also utilised to identify the in-situ methods used by VTS operators to increase the uptake of the VHF radio message. The VTS operators repeat important information, speak loudly, slowly, emphasize words, extend vowel sounds, use intonation to imply questions and correct information. These fine grained communicative strategies are accomplished by the VTS operators in their institutional interaction with seafarers for clear communication.

The situated actions of VTS operators highlight the context dependent and contingent nature of rule following (see Wieder 1974; Suchman 1987). If deemed appropriate, in the interest of safety, the VTS operators provide Navigation Assistance Service (NAS) to ships. In itself, NAS provision is not problematic, however the manner of NAS provision is contrary to IMO (1997b) guidelines, in which the recommendations state that the instructions should be result oriented and the manner of execution should be left to the ship. In MahaDevi, the VTS operators give ships an explicit course to steer, as in the case of *Michael* to come back into the main channel (example 8.2). Perceiving a dangerous situation and resolving it, leaving nothing to chance is accomplished by the VTS operators and is an accountable feature of their institutional work. This highlights a dialectical tension between the situated practice and the international rules that highlight NAS should not be provided in the manner as in example 8.2, below.

Example 8.2: Summons utterance on the VHF
62.**VTS –** Yeah *Michael*, what is your course now?
63.**Michael –** two, nine, zero (.) two, nine, zero
64.**VTS –** alter to two, five, zero (.) two, five, zero

The VTS operators do not follow the rules formulated for the VTS in the IMO (2002b) SMCP[138]. The IMO (2002b) SMCP format for the summons utterance requires the caller to utter the name of the identified respondent thrice, which is rarely ever done in practice. The *confirmatory form of talk* (Bailey et al. 2006), closed-loop communication and the ‘read back’ (IMO 2002b) are largely absent on the port VHF radio and confirmation is reformulated (Froholdt 2011) for economy to minimise radio occupancy on a busy VHF channel (Falzon 2009). The VTS operators mostly do not use the IMO (2002b) SMCP, however they use brief, predictable utterances unless they encounter non-standard requests (cargo of a dead body or undertaking an ROV wet test), whereupon their language moves away from the script and becomes loose (Goffman 1963). The inadequacy of the interactional sequence is also highlighted by Zimmerman (1992), wherein the sequence would need to be modified, augmented or abandoned altogether by the call taker in the emergency centre. Other IMO (2002b) SMCP rules not followed by the VTS operators are the non-existent usage of any of the eight message markers to clarify VHF utterances and the handing over and taking over of targets between two VTS sectors. Identities are not confirmed with each turn at talk by the

[138] The VTS operators were not trained in the IMO SMCP (2002) and were not aware of it, and therefore the rules highlighted therein were not followed.

speakers and instead of passing/receiving one piece of information with every turn at talk, the VTS operators and pilots communicate in dense, information saturated and truncated utterances to minimise radio occupancy (Hutchins 1995). The members accomplish channel switching to minimise air time and leave the main VHF channel free for others.

Chapter 7 identifies the micropolitics of port communication as a social and organisational challenge in the work of VTS operators and answers the final research question pertaining to the challenges in the performance of institutional work. There is a high incidence of on-air communication on the marine radio. Transgression of VTS air space, on-air knowledge displays by the Dock Master and public delegation of ancillary work are accomplished by the Dock Master and the pilots and impact the work of the VTS operators and their work environment. There is asymmetry on the port radio, highlighted by performance of hierarchy, reprimands and performance of power, rank and status. The performance of hierarchy is accomplished by the VTS operators to display authority, delay response to small craft, align the perspective of small craft with that of the VTS and withhold permission to cross the channel, until it is clear of all traffic. Reprimands are accomplished by the VTS operators and are utilised to perform authority, down-grade the reprimanded entity, re-inscribe port hierarchies, reclaim VHF territorial speech rights and serve as an example to other listeners to desist from behaviour similar to the reprimanded vessel.

The key maritime findings have been discussed in the respective empirical chapters, above: these are the lack of harmonisation in VTS training (VTSOs untrained as per IALA V-103); divergence of VTS practices from the rules delineated in the IMO (2002b) SMCP; its limited use in VHF interaction; non-utilisation of the eight IMO (2002b) SMCP message markers; the manner of NAS provision which encroaches upon on-board decision making, contrary to IMO (1997b); unconventional handing over and taking over of targets between neighbouring VTS; non-confirmation of identities with each turn at talk; the use of dense, information saturated, truncated utterances that minimise airtime and the prevalence of VHF radio communication to negotiate passing, overtaking and collision avoidance situations. Furthermore the accomplishment of vessel trajectories through key communicative stages and associated activities is extremely important from a maritime perspective as this would enable the port authorities to evaluate the reporting points and reporting requirements that promote safe traffic movement. The in situ findings of the daily VTS' operations are extremely important from the point of view of the maritime industry, which is expanding upon and realising the IMO's (2009) e-Navigation initiative, of which technologically mediated ship-shore communication is a very important part.

This section has enumerated the key sociological and maritime findings and the following section (8.3) discusses the limitations of the research.

8.3 Limitations of the Research

Like all research endeavours, this study has its limitations. The study design of an eclectic approach was true to the research focus to retain the breadth while analysing the accomplishment of in situ work and its challenges, however the study would have benefitted if conversation analysis could have been utilised further to explore some of the findings in-depth, such as dealing with interruptions on the VHF radio. Time constraints did not permit conversation analysis to be used extensively in the study. Another criticism that can be levelled against it is the seemingly short duration of research fieldwork – a total of 12 days that includes site visits (2 days), the pilot (3 days) and the main study (7 days). In this respect, the fieldwork for the main study comes across as a short clinical surgical strike. Justification for the number of days in the field is that it is exceedingly difficult to obtain access to VTS offices in India, given the bureaucratic organisational structure. Indian port facilities are headed by senior civil servants of the central government and securing access through several gatekeepers takes several months of prolonged negotiations and renewing entry permits is not easily forthcoming[139]. My study is not a traditional ethnography which requires a prolonged engagement in the field (Malinowski 1922, 2010 edition; for a mini ethnography see Sampson 2005); it is primarily based upon the audio recordings of the naturally occurring interaction on the VHF radio and I obtained 85[140] hours of audio data, which was more than adequate for my study. Given the large data corpus I had, it was decided that it would be more than adequate for my study to transcribe verbatim 24 hours of continuously recorded data and annotate the rest. I transcribed verbatim nearly 30 ½[141] hours of VHF radio interaction. The duration of my fieldwork was neither short, nor excessive as it adequately supported my research design and focus. In the number of days I spent in the VTS office of MahaDevi port, I conducted eight

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139 For my pilot study, I had to furnish another application and request the Senior Dock Master in person to extend my permit to visit the VTS office by one more day.

140 In addition to the ten interviews from the main fieldwork site.

141 24 hours of transcribing was considered adequate but I transcribed 30 & 1/2 hours to complete the audio file, I had begun to transcribe.

interviews with all of the VTS operators who were reporting for duty on a rotational shift and also with one VTS supervisor and the Harbour Master. I collected the data I needed and would have risked overstaying my welcome by seeking further permission to extend my permit, not to mention the extra data I would have recorded which I would not need in contravention of research ethics.

My study more than makes up for the less number of days spent in the field by the methodological preparation I undertook before entering the field which enabled me to hit the ground running (see chapter 3). I entered the field site for the main study four months after I had commenced the site visits. I had also undertaken a pilot in the neighbouring Indian port to fine tune my observation and interview guides before the main study and was well prepared to conduct fieldwork in MahaDevi, which I knew was not easy to get access to. My research design more than makes up for the days I spent in the field and I argue that the research is stronger for it.

Logistical and financial considerations also impacted the duration of the fieldwork. It was expensive to conduct research in the Indian port city with my family in tow. From the nearest Indian seaport, my family home in North India is more than 24 hours away by the fastest train, or two hours by air. I had to fly my family (two children and their grandparents) to the Indian port city to facilitate my fieldwork. I could not proceed alone for the fieldwork as my 10 month old baby needed me in the evenings. The cost of accommodation, sustenance and transport continued to accumulate as I was conducting fieldwork in a port city far from home.

Another limitation of the study is with respect to the recording of data. I recorded the naturally occurring VHF interaction on a digital voice recorder and could not record all of the video information from the screens of the VTS operators while they were taking radio calls. I could only record small videos off the screen, as I did not have the technological capability or the permission to mount sophisticated equipment to video record information off their screens for the full 85 hours of audio that I obtained (for the value of video recording institutional calls, see Fele 2008; Mondada 2008). The VTS system has the option of recording an eight hour traffic track complete with the information from all sensors (radar, ECDIS, AIS and the audio track). However, the VTS has exclusive hardware and software configurations for institutional use that would not work on any other equipment available on the market and hence was of no use to me. I had to make my own arrangements for recording data and I equipped myself with a digital camera and a digital voice recorder, which served my purpose well. In order to record information off the screens, I would have required a tripod and sophisticated recording equipment which would have had to be mounted behind the VTS operators. Such an approach would have been overly intrusive and unethical in the small space of the temporary VTS office (as the main office was undergoing renovation when I conducted my fieldwork and the VTS operators were working from a small makeshift office). While the information from the VTS operators' screens for the whole duration of my fieldwork would have been useful, I made up for it with field notes of ethnographic observations and interviews which enabled a nuanced picture to emerge of the institutional practices and interaction that go into the achievement of safe harbour/fairway navigation. My research did not depend upon the video recording of information from the screens, as an accident investigation is wont to. My research was designed to use several complementary ethnographic research techniques to generate data to enable me to explore and appreciate the institutional practices in the VTS office and my research methodology makes good this need.

Another limitation of my research is that the main study was conducted in the VTS office of one port. Even though the data generated from my study was sufficient for my research purposes, the study would most certainly have benefited if I could have included additional ports in my research and interviewed more VTS operators. The length of time it requires to negotiate access to the VTS office as well as the financial and logistical considerations advocated against extended fieldwork. An argument in favour of my research is that while it was conducted in one port, the major Indian port is a *critical case* (see Goldthorpe et al., 1968) (for example, if the international regulatory environment has not impacted the training regimes of this port, it is highly unlikely that they have impacted elsewhere). MahaDevi port has 24 hour operations, irrespective of tidal variations, and is a multipurpose port that caters to all kinds of cargo. It can safely be said that the port is an exemplar for other major ports in India with respect to the VTS system and the training of VTS operators.

Alhough the main study was conducted in the VTS office of one port (see Burawoy 1998), the research makes valuable contributions to literature on the VTS (as discussed in chapter 2) and reveals pertinent insights into the institutional achievement of harbour/fairway navigation and the port interaction order. The study is unique in the VTS as it explores the work of the VTS operators, including the challenges they face in the accomplishment of their institutional work.

8.4 Suggestions for Future Research

One of the main suggestions for future research is to adopt a broad eclectic approach to social theory to explore the sociological inquiry of the interaction order. Future research design to explore the interaction order need not necessarily be a study of work, like mine. This study has ethnographically explored the in situ work of the VTS operators engaged in the practical management and coordination of harbour traffic. The research discusses the routine institutional work of the VTS operators, including the inherent challenges, and in doing so, makes a unique contribution to knowledge of VTS work. Even though the research provides a comprehensive analysis of the work of the MahaDevi VTS operators, the study is not free from limitations as discussed in section 8.3 above. In order to overcome the identified limitations of the study and contribute to knowledge in the VTS, recommendations are made for the direction of future research.

The main study was conducted in only one major Indian port and in order to increase the generalizability of the study, further research needs to be undertaken to include the VTS offices of other major and non-major Indian ports. Future research should focus on both big and small ports as well as government and private involvement in the provision of VTS services. This would enable the empirical exploration of VTS operations across a range of contexts. In addition to increasing the number of ports to be covered by research, the number of VTS operators participating also needs to be increased. This would facilitate the involvement of VTS operators working in different ports with diverse operational requirements and reveal insights into the locally situated operational practices of the different ports.

Research direction is also suggested on the basis of data that can be included in studies in the future. In my research, I obtained audio recording separately on a digital voice recorder, made small videos and took pictures of the VTS screens with my small digital camera. Future research can study comprehensive audio and video data from the VTS system which captures the screen of the VTS operator together with the audio of the VTS operators' VHF radio interaction. The video of the VTS monitor depicts the radar track of vessels, AIS information, electronic charts of the VTS area and alarms alerting the VTS operators of any impending dangerous situation. The comprehensive recording of the audio and video data will support the correlation of the VHF interaction with the channel situation (as available to the VTS) and would be useful for future research. The facility to make such data available is now a reality with the upgrading of VTS systems that allows for data to be saved, recorded and made available on portable media which can be used on a personal computer/laptop. VTS research exploring the work of operators would benefit from researchers with VTS experience and/or navigation. The following section highlights the unique contributions of the study.

8.5 Contributions of the Study

This penultimate section highlights the theoretical, methodological and empirical contributions of my research. The main contribution of the study is that it provides a thick description (Geertz 1973) of the haecceities of VTS work (Garfinkel 2002; 2006), its in situ accomplishment (Garfinkel 2002; 2006), inherent challenges and the research design that enabled the exploration of constitutive and institutional orders (Rawls 1978; 1989; 2009) rather than study social order as a dialectic between structure and individual agency. My modest contribution to theory lies not so much in theoretical contribution but rather in drawing upon theories to illumine findings where need be and thus has a more methodological focus. My research empirically demonstrates that an eclectic approach to social theory supports the study of the interaction order.

Understanding of everyday operations is extremely important for the maritime industry; this knowledge is required for the functional modelling of complex socio-technical systems, such as the VTS and the understanding of functional resonances that may accrue in unexpected ways and cause an accident (Praetorius et al., 2015). My study of in situ accomplishment of work is extremely beneficial as it provides the findings of the everyday operations as required for understanding risk and safety in the critical work setting of the VTS. Clear communication is key to enhancing maritime safety and preventing accidents; restricted and congested sea areas are extremely critical, given the potential threat to life, property and the environment and my thesis sheds light on the communicative management of vessels in the VTS area and would benefit the maritime community by identifying current VHF practices in critical waters.

My research in the MahaDevi VTS contributes to the current academic knowledge on the VTS (Brödje et al. 2010; Praetorius et al. 2010; 2011; 2015; Froholdt 2011; 2012; 2013). The study has practical applications for the shipping industry as it contributes to our understanding of vessel trajectories, key communicative stages, communicating groups and nuanced interaction at key stages that facilitates the communicative management of harbour traffic. It empirically highlights the fine grained, routine in situ practices operationalised by the VTS operators to achieve harbour/fairway navigation. My study also illumines the differential interpretation of

International IMO guidelines (particularly in relation to VTSO training) in the national context and would be of interest to policymakers.

A key methodological contribution of my study is the exploration of the communicative management of harbour traffic by studying vessel trajectories (see chapters 5 and 6). I decided to follow vessels as they made their way in and out of the port to understand the management required for each vessel in the harbour. This is the first time such an approach has been adopted in researching the work of VTS operators and it revealed categories of vessel trajectories in the harbour and their respective empirical communicative management. Exploration also revealed the inadequate closure in the inbound Sagar port vessel trajectory, where no contact is made with the VTS after the initial post pilot boarding communication (see chapter 6). This effectively means that the exact time when an inbound saga port vessel leaves the MahaDevi port limits and enters the Sagar port limits is not available to the listeners. Due to my ethnographic fieldwork, I could recover the phenomena of the almost invisible inbound Sagar port vessel trajectory by utilising alternate data sources like the video recording from the VTS monitors. However, I have argued (chapter 6) that adequately closing the inbound Sagar port vessel trajectory would contribute to enhanced situational awareness of all listeners and particularly the MahaDevi VTS operators as they would be informed that a vessel has left their waters. I have recommended a key communicative stage to be established for reporting when exiting MahaDevi port limits and entering Sagar port limits for enhanced situational awareness.

There is a paucity of literature on the non-technical aspects of VTS work (Froholdt 2011, 2011c; Praetorius et al. 2012; Brodje et al. 2013) and none of the studies have been conducted in India. Indian VTS operators have hitherto been ignored in academic scholarship in the VTS and my research addresses gap in the knowledge. My empirical contribution to the literature enables the MahaDevi VTS operators to occupy centre stage and discusses the provision of VTS services in the Indian context. My VTS research is unique as it is currently the first and only study conducted in a developing country and while India is not representative of all developing countries, it can be considered the critical case for ports in developing South Asian

SAARC[142] countries. My study is uniquely positioned with respect to the others in the VTS and makes a welcome contribution to knowledge.

8.6 Recommendations and Conclusion

This final section concludes the chapter as well as the thesis. The recommendations are based on my research findings and mostly pertain to the training of Indian VTS operators. Section 4.4.3 of chapter 4 discussed VTS operator training in India wherein it discusses that the VTS operators usually come from a defence background or the civilian merchant Navy. The ex-defence personnel have previously been trained in radio-telephony by the Signals Corps of the armed forces (Indian Navy) while the VTS operators with a merchant navy background have previously served as a Radio Officer[143] on board oceangoing ships and have obtained a certificate in radio telephony from an Indian Maritime College. The focus of the training of MahaDevi VTS operators has largely been on the procedures of radio telephony and the operation of VTS equipment. This training is not the same as the comprehensive IALA-AISM V-103 (2005) training known in Europe with its 8 training modules *(language, traffic management, equipment, nautical knowledge, communication co-ordination, VHF radio, personal attributes and emergency situations).*

For the VTS operators in India, I would recommend training in line with the international IALA V-103 (2005) to enable the VTS operators to embrace VTS service provision in a well-rounded manner. The training course would make them appreciate the VTS from the perspective of the navigators. The VTS operators need to be made aware of the services they provide as well as the legal issues (liability) applicable to their work. Progress has been made in India with respect to this training recommendation. In February 2014 an IALA-DGLL (2013)[144] VTS training cum workshop was organised in Kandla, Gujarat in Western India. Hereafter VTSO training in India would need to be organised according to the IALA V-103 (GOI 2013). VTSO and VTS supervisor training courses would need to be planned, designed and accredited before the commencement of any training in India.

142 SAARC – South Asian Association for Regional Cooperation comprising Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. India is a strong regional economy and is a critical case with respect to seaports in SAARC countries with a coastline (Afghanistan, Nepal and Bhutan are land locked).

143 Currently this position does not exist on-board merchant ships.

144 DGLL – Directorate General of Lighthouses and Lightships, India.

A recommendation pertaining to VTS operational procedures is that the empirical findings of vessel trajectories and key communicative stages should be used to supplement the reporting points identified by the port. The port authority should evaluate the current communicative practices highlighted in my findings and where required should complete the trajectories and/or use them to inform future training. One recommendation pertaining to the partial Sagar port trajectories is that in order to comprehensively explore them, data recordings from both VHF channels 15 (MahaDevi port channel) and 17 (Sagar port channel) would need to be analysed in the future. The empirical findings can also serve as useful input for streamlining operational practices and procedures in the VTS office.

A final recommendation is made with respect to the interpersonal interaction between VTS operators, the Dock Master and harbour pilots. Chapter 7 on the Micro-Politics of Port Communication has discussed the performance of rank, status and hierarchy on the VHF radio in detail. I recommend that port authorities should inform all stakeholders that the marine radio is a neutral space for undertaking safety-related professional communication and participants should not use it as a medium for undertaking any communication that could downgrade the role identity of the VTS (for example – internal/ancillary communication, demonstrating superior knowledge, quarrelling, reprimanding and performing hierarchy on the VHF radio). The interaction in the port should be supportive of VTS operators to facilitate the critical work required of them. Simply because a colleague is lower ranked does not imply that the colleague can be treated less than equal.

It has previously been discussed that the VTS operators believed that their clerical rank, status and salary did not match the safety critical work required of them (see chapters 4 and 7). Recommending a higher salary and grade is beyond the scope of this thesis. However, I do believe that after being trained according to the IALA-V103, the VTS operators stand a good chance for a possible revision of their employment grade and pay scale.

The thesis presents a unified cohesive vision of the research narrative. It unequivocally answers all of the outlined research questions of the study (see chapter 1, pages 10-11). Each of the chapters, 1 through to 7 have contributed to answering the different research questions. Chapter 1 discussed the role of the VTS in the maritime industry as a service provider to promote safety, efficiency and environmental protection. The chapter built a case for the study enumerating exemplar cases of accidents in VTS areas. Chapter 2 further contributed to our understanding of the work of VTS operators in relation to academic scholarship. Chapter 4 located the social actors in the harbour, contextualised the complex space and furthered our understanding of the work of VTS operators, its organisation and the inter-play between the different actors over the port radio. Chapter 4 also identified challenges in the work of VTS operators – lack of technological support and the social, organisational challenge of asymmetry with hierarchy featuring on the marine radio. Chapter 7 nuanced the theme of asymmetry in-depth and empirically demonstrated the palpable hierarchy in the port, thereby answering the question pertaining to challenges faced by VTS operators. Chapters 1, 2, 4 and 7 answered two research questions regarding the work of VTS operators and the challenges faced by them in the accomplishment of institutional work.

Research questions pertaining to the in situ accomplishment of institutional work have been answered by chapters 5 and 6, which have empirically nuanced the practices, procedures and processes to manage vessel traffic in the harbour/fairway. These chapters have empirically identified and documented the interactional communicative management of harbour/fairway navigation. All of the identified research questions have been answered and demonstrated in the thesis' chapters.

This thesis is for the VTS operators who are the sentinels in the harbour. They are the eyes and ears of the port authority; responsible for efficiency, safety, environment and even security. My study makes a nuanced contribution to our understanding of their work and its integral challenges. It contributes in its own small way to support the work of VTS operators. Meanwhile, time passes, *Aasha* calls to request permission to cross the channel and go to the bunders from inner anchorage; the VTSO says –

> **VTS –** Abhi ruko dredger aa raha hai clear hone ke baad jao (transliteration)
> **VTS –** Wait now, a dredger is coming, go after it clears (translation)

Appendix 1: School Research Ethical Approval Letter

Cardiff School of Social Sciences
Director Professor Malcolm Williams
Ysgol Gwyddorau Cymdeithasol Caerdydd
Cyfarwyddwr Yr Athro Malcolm Williams

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Cymru Y Deyrnas Gyfunol

5th November 2010

Our ref: SREC/663

Aditi Kataria
PhD Programme
SOCSI (SIRC)

Dear Aditi

Your project entitled "*An Ethnographic Exploration of Ship – Shore Communication*" has now been approved by the School of Social Sciences Research Ethics Committee of Cardiff University at its meeting on 4th November 2010 and you can now commence the project.

Please note that since your project involves data collection abroad you may need approval from a competent body in the relevant jurisdiction.

If you make any substantial changes with ethical implications to the project as it progresses you need to inform the SREC about the nature of these changes. Such changes could be: 1) changes in the type of participants recruited (e.g. inclusion of a group of potentially vulnerable participants), 2) changes to questionnaires, interview guides etc. (e.g. including new questions on sensitive issues), 3) changes to the way data are handled (e.g. sharing of non-anonymised data with other researchers).

All ongoing projects will be monitored every 12 months and it is a condition of continued approval that you complete the monitoring form.

Please inform the SREC when the project has ended.

Please use the SREC's project reference number above in any future correspondence.

Yours sincerely

Professor Tom Horlick-Jones
Chair of the School of Social Sciences Research Ethics Committee

cc: E Renton
Supervisors: N Bailey
W Housley

Appendix 2: Research Access Application Letter

The Chairman
[redacted] Port Trust
India

Date [redacted]

APPLICATION FOR CONDUCTING RESEARCH AT [redacted] PORT

Dear Sir,

1. I, Aditi Kataria, am a research fellow at Cardiff University, Wales, United Kingdom, pursuing my PhD research under the aegis of the Seafarers International Research Centre, SIRC–Nippon Foundation Fellowship Programme. The Nippon Foundation of Japan, together with SIRC, annually selects about three students from developing countries to research the human element in shipping and build maritime research initiative to benefit the home country of the student. I am the first Indian woman to be selected in the programme, since the fellowships began in 2004. I am from the fifth cohort and was inducted into the fellowship programme in 2008.

2. I am researching ship–shore communication. Issues pertaining to language and communication in radio communication between the shipboard seafarers and the shore based Vessel Traffic Service (VTS) officers will be explored in depth in my research.

3. I have been advised by my supervisors in the university to undertake the research in my home country – India; it being a vibrant upcoming economy. Yours is one of the most prestigious ports in India, vital for the nation's economy and trade between India and the rest of the world.

4. I would be grateful, if I could be permitted to conduct research at (omitted) port to appreciate the work of VTS officers, their experiences of ship–shore radio communication and the challenges they face while communicating with seafarers from diverse nationalities, especially when ships are increasingly manned by multilingual crews and English is increasingly used as lingua franca in shipping.

5. Please find enclosed my project proposal.

Looking forward to your favourable consideration of my application.

Yours sincerely

Aditi Kataria

Encl: Project proposal

Appendix 3: Project Proposal

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

Project Proposal – *Ship – Shore Communication*

The study is a PhD research project being conducted under the auspices of the SIRC–Nippon Foundation Fellowship programme of the School of Social Sciences, Cardiff University. The study explores language and communication issues between the ship's bridge and the shore based Vessel Traffic Services engaged in the management of sea traffic.

About 90,000 ships move in and out of ports worldwide. This ocean going traffic needs to be monitored for the safety of navigation and the environment. Vessel Traffic Services (VTS) are established in busy shipping lanes, channels and port and harbour approaches to aid the safe movement of marine traffic. The Vessel Traffic Services monitor the developing traffic situation in their area and talk to ships on VHF radio (Very High Frequency). This study focuses on *'talk'* in the performance of organisational roles of the communicating VTS officers and seafarers and the role of language in the achievement of the professional task of safe navigation of marine traffic. Clear communication is vital for the safety critical and the time critical nature of navigating in coastal waters. Especially when ships are increasingly manned by multinational crews and English is used as lingua franca.

Method

Elements to the data collection.

- ship–shore interaction on VHF
- VTS office

1. The research in the VTS office involves VHF recordings, observation of the organizational role of VTS officers in their work space and semi structured interviews with VTS officers.

The ship–shore conversations on VHF radio can be viewed as a public performance. Anyone with a VHF radio, including all ships in the vicinity can hear the conversation on a particular channel frequency. VTS record all interaction on the VHF channels they monitor in their area. I aim to collect a copy of the recordings for my study and would request the same from the port authority. I would require up to a week of recorded data. This data forms the backbone of the project and would be supported by fieldwork that encompasses both the spaces from which ship–shore communication is carried out.

2. I would interview the VTS operators about their experience of communicating with seafarers from different nationalities, the challenges they face and the strategies they employ for ship – shore communication.

Ethical Considerations

The research has been approved by the Ethics Committee of the School of Social Sciences, Cardiff University. The research will be conducted overtly after securing permission from all concerned personnel. Informed, willing and voluntary participation would be sought in the project. Complete confidentiality and anonymity will be maintained.

Even though English may not be the first language for the VTS operators and most seafarers visiting an Indian port, they would be conversant in English as IMO has ratified English as the language of the sea. Clear communication is vital for comprehending VTS instructions and the intentions of the ships in the area, especially when ships are manned by multinational crews and most of the ship–shore communication is between non–native speakers for whom English is the second language. The importance of this study lies in the role of language in promoting safety in maritime communications.

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Appendix 4: Permission to Conduct Research in the Port VTS Office

The Nippon Foundation

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYD

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Fax +44(0)29 2087 4619
Email sirc@cardiff.ac.uk

To,
The Asstt. Manager,
Permit Section,
Omitted Port Trust.

Sub: Issuance of Temporary Dock Entry Permit.

Ref: Work Order/Tender No./Contract No VTMS Study as directed by our CHAIRMAN

Kindly issue Temporary Dock Entry Permit for a period of 6 (six) days starting from
Dates omitted for the person whose details are as:

Initials omitted

Stamp omitted

1) Name	:	Aditi Kataria
2) Age	:	Thirty Two
3) Sex	:	Female
4) Designation	:	SIRC Nippon Foundation Fellow
5) Nationality	:	Indian
6) Identification Mark	:	cut on right leg
7) Residential Address	:	Address omitted
8) Place of Work	:	Cardiff University, UK
9) Purpose of Work	:	Study
10) Signature of Pass Holder		Signature omitted

Stamp and signature omitted

I, declare that the above information furnished is true. Further, I hereby undertake the full responsibility for ensuring good conduct of above person inside the port premises.

Recommended as directed by Chairman DEP free of cost may pls. be issued for study of VTMS

Stamp and signature omitted

Signature of Authorised Signatory
(With Rubber Stamp)

Appendix 5: Information Sheet for VTS Operators

SIRC (Seafarers International Research Centre)
52 Park Place
Cardiff CF10 3AT
Wales UK
Tel +44(0)29 2087 4620
Fax +44(0)29 2087 4619
Email sirc@cardiff.ac.uk

Ship – Shore Communication

I am a PhD student with the School of Social Sciences, Cardiff University, United Kingdom and am pursuing my studies under the aegis of the SIRC–Nippon Foundation Fellowship programme of the University. I would like to invite your participation in my research. Please take a few minutes to read the information on this sheet.

The aim of my research is to study language and communication issues in ship–shore communication. There are many similarities in the work of Air Traffic Controllers (ATC) and Vessel Traffic Service (VTS) officers. Although there has been research on communication between the airplane cockpit and ATCs in aviation; language and communication research in shipping has not yet looked at ship–shore interaction.

My research involves interviews with VTS officers about their experiences of communicating with ships. I need to observe the work in the VTS office to learn about what is involved in VTS operations. The research will be conducted with your permission. I would audio record interviews with your permission. Complete confidentiality and anonymity will be maintained. If you wish to withdraw from the research at any time for any reason, you can.

The data generated from the research would be stored at a secure location in Cardiff University. Only the researcher and her two supervisors would have access to the same. The data from this study would be anonymised and used for my PhD thesis, academic research papers, presentations and a summary of the findings to be circulated to all interested research participants and participating organizations.

Please feel free to contact me if you have any questions and would like further information or clarification.

Aditi Kataria
+44 02920 [redacted] (UK)
+44 [redacted] (UK)
+91 (0) [redacted] (India)
+91 (0) [redacted] (India)
[redacted]@cardiff.ac.uk

Thank you

Appendix 6: Informed Consent Form for VTS Operators

Ship – Shore Communication

I ....(Print Name) confirm that I have read and understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered to my satisfaction. The objectives and purpose of the research have been clearly explained to me and I have been assured of the confidentiality and anonymity. I understand that my participation is voluntary and that I am free to withdraw at any time.

I have/have not* agreed to a video recording of this interview between me and the researcher
I have/have not* agreed to an audio recording of this interview between me and the researcher
I have/have not* agreed to being observed by the researcher

(Signed)..(Dated)...

Please enter your contact details below if you wish to receive a summary of the results

Address………………………………………………………………………………………
…..……………………………………………………………………………………………
……………………………………………….Email………………………………………...

* Please delete as appropriate

Appendix 7: Interview Guide for VTS Operators

Biographical Questions

- – Gender, Age
- – Designation
- – Past seafaring experience, if any

English language training and competency

- – Age at which began learning English formally
- – Where did one learn English?
- – Comfort level with English

Radio communication training and experience

- – Courses undertaken / certification obtained, if any for recruitment as VTS operator
- – Courses undertaken, if any for radio communication
- – Courses undertaken, if any for Maritime English
- – When did one first start as a VTSO?
    - How much experience does one have of radio communication?
- – Experiences of ship–shore VHF radio communication
    - Anecdotes / stories
- – Challenges faced in ship – shore radio communication
    - Language, noise, technology, work load, stress etc.
- – Strategies employed for ship–shore radio communication

Maritime English and radio communication

- – Does one use maritime English for ship–shore radio communication?
    - If Yes, then why? and
    - If No, then why not?
- – Advantages of using Maritime English in ship–shore radio communication
- – Disadvantages of using Maritime English in ship–shore radio communication

Nature of the work of VTS officers

- – To explain their work to me and the different technologies that shape it and the various components that go into it?
- – When is the radio communication to be undertaken?
- – What does the radio communication entail?
- – How is it to be performed/carried out?
    - Content of message
    - Context of message

Appendix 8: Observation Guide for VTS

Office location and layout

– The space

– Equipment and position of radio

Monitoring of traffic and radio communication

– Technology

- ECDIS, RADAR, AIS etc.
- Technological input, shaping/ informing content of communication

– Communication routine during departure/arrival of vessels

– Communication content and context

Geographical locale, physical features and radio communication

– Embedded / locally situated nature of ship-shore radio communication

Observation of the VTSO on the radio

– Preparation, if any prior to making the call

– Content and context of communication

– Manner of delivery

– After the call

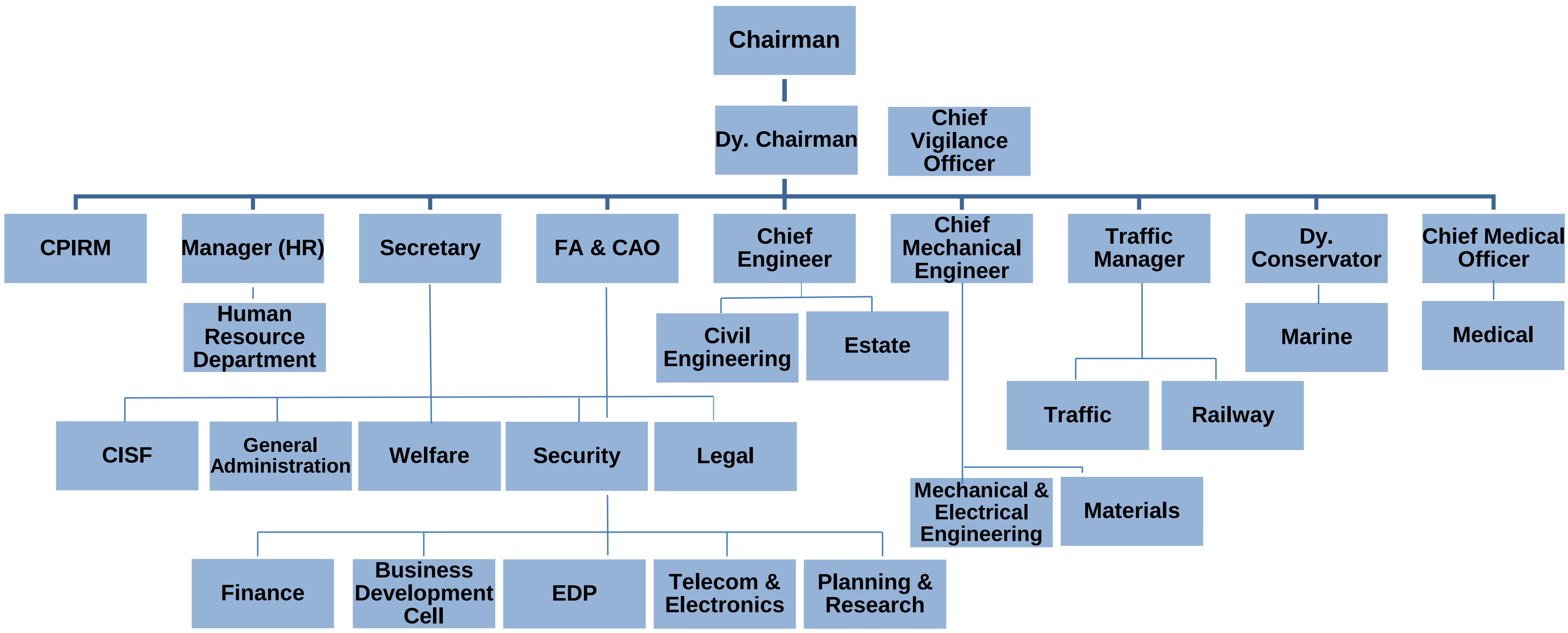
Appendix 9: The Radio Alphabet[145]

The International Phonetic Alphabet recommended for use at sea to enunciate individual letters of the alphabet using standard English words.

A: Alpha
B: Bravo
C: Charlie
D: Delta
E: Echo
F: Foxtrot
G: Golf
H: Hotel
I: India
J: Juliet
K: Kilo
L: Lima
M: Mike
N: November
O: Oscar
P: Papa
Q: Quebec
R: Romeo
S: Sierra
T: Tango
U: Uniform
V: Victor
W: Whiskey
X: X-Ray
Y: Yankee
Z: Zulu

[145] Source: IMO SMCP (2002b)

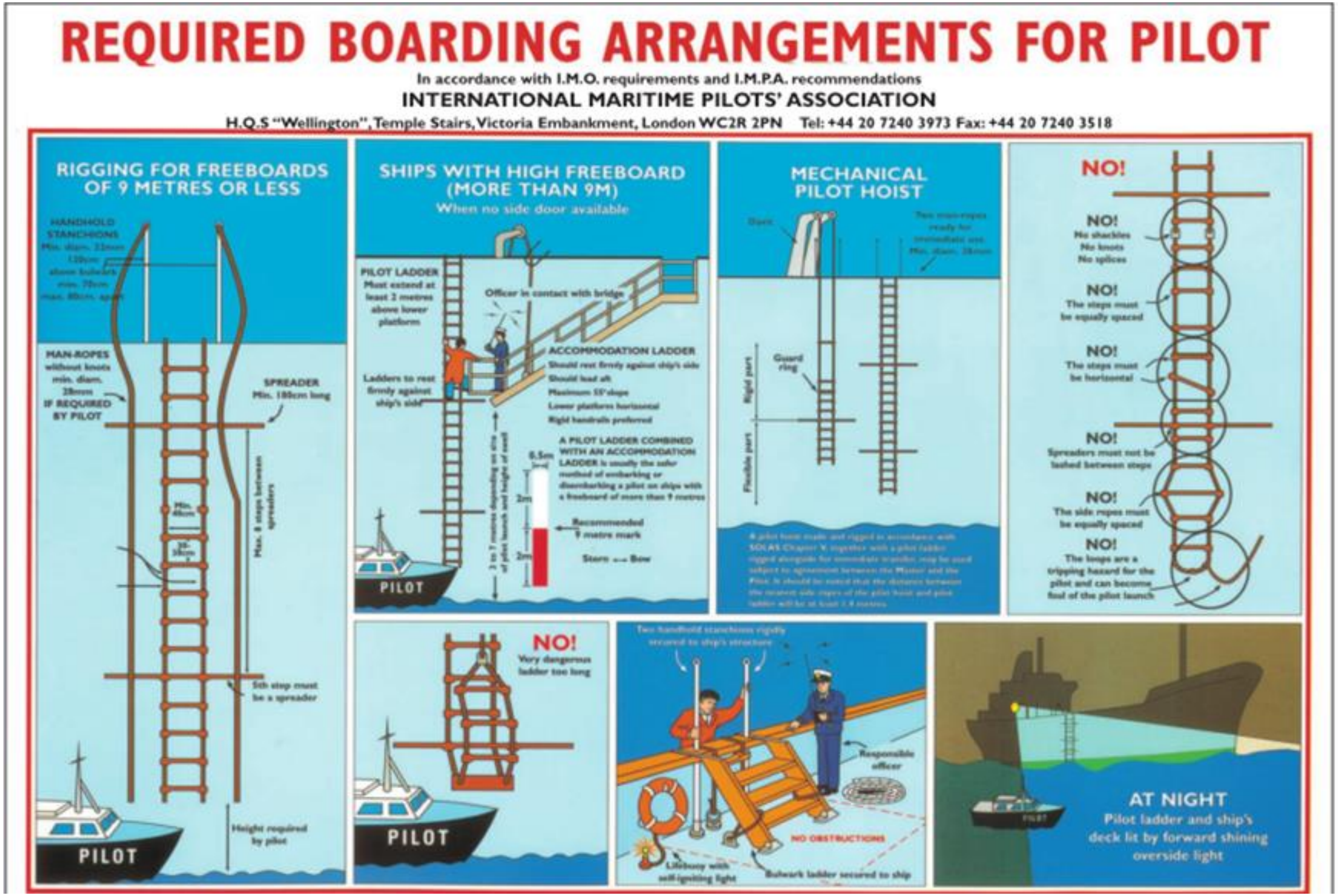
Appendix 10: Organization Chart of MahaDevi Port



Source: www. (omitted).gov.in (suitably anonymised)

Appendix 11: Pilot Boarding Arrangements

Source: IMPA, International Maritime Pilots Association (2001, p.16)



Appendix 12: Speakers' Identification in Thesis Excerpts[146]

A18	Albatross 18
B	Bhavini
C/O	Chief Officer
DM	Dock Master
DS	Dreamy Sky
GA	Global Atlas
GL	Gracious Lady
HC	Harbour Control
HK	Hong Kong
K20	Kajal 20
L 105	Liberty 105
LE	Lunar Eclipse
MRM	MahaRishi Muni
MVI	MV Infinity
NC	Navy Control
OP	Ocean Pioneer
OS	Offshore Supplier
SM	Sea Mermaid
SP	Sagar Port
SR2	SriRam 2
T3	Tiger 3
T5	Tag 5

[146] In most cases, the names of speakers are mentioned in full in the thesis' excerpts. This appendix helps identify those speakers whose names were not provided in full in the excerpts.

Appendix 13: Transliterated Text[147] Rendered in Devanagari Script

Page IX

हम उनको समझा देते है

Page 92, 260

लिखो लिखो, मेरा नाम लिखो

Page 94

तेरी गांड में लंड

Male voice: तुम लाख छुपाओ प्यार मगर, दुनिया को पता चल जाएगा

Female voice: लेकिन छुप छुप के मिलने से, मिलने का मज़ा तो आएगा

Page 100

VTS – Sagar Port, बोलो

SP – हाँ नमस्कार timing देना है मुझे

SP – Okay, आपका कोई आएगा?

Page 110

हमारा काम है, eta लिया, उसको pass किया

Page 110

ग़लती हम कर ही नही सकते

Page IV, 120, 128, 166, 167, 243, 244, 253, 263, 270

साहिब

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[147] Transliterated text has been translated and presented alongside throughout the thesis, while Appendix 12 renders it in the Devanagari script for those proficient in the Hindi language.

Page 126

अरे पागल करे

Page 128

VTS – Kajal, अभी launch आपके पास आ रहा है. साहिब का जो चश्मा, Specs है ना आपके पास; साहिब का कुछ चीज़ है ना आपके पास. Pilot launch जो है, pilot launch आपके पास आ रहा है. अभी आप dredging area में है ना?

Page 133

चुप कर भोसड़ी के, मादर चोध

तेरी मा और तेरी बेहन भिंडी बेज़ार बैठी है क्या बेसुरा?...तेरी मा को कोई मिल गया?

Insult – मादर चोध, कौन बोल रहा है? तेरी मा की चूत

Response – तेरा बाप बोल रहा है.

Page 135

रात को क्या बोलते है यह लोग. बाप रे बाप

अच्छा है

Page 136

दिल चुराने आ गया

दिल चुरा ले जाउन्गा

Page 137

अरे पुराना हो गया. नया गाना गाओ

फिर वोही गा रहा है

अबे चुप बे. कौनसा गाना गा रहा है. गान्डू साला

Page 139

Speaker 1 – आवाज़ कम कर

Speaker 2 - तुझे singer बनना चाहिए, इधर क्या कर रहा है

Singer – अरे क्या करूँ यार

Speaker 2 – अभी मौका है, idol 6, 7 आने वाला है

Singer – छोड़ देता हूँ shipping line को, ठीक है

Page 150

वह बाहर पहुँच के हमे call करते है

Page 166

SP 80 – हां Global Atlas में pilot कौनसा है?

Page 170

"Crew nationality Hong Kong है पर ठीक बोल रहे है"

Page 100, 166, 191, 205, 206, 217

हाँ

Page 192

Pilot – Anchorage में कौनसा barge जा रहा हैं Royal Gala, Royal company का?

Page 195

SP 82 – Dredger का नाम क्या है?

Page 197

M30 on NAM 123 – क्या inbound traffic है?

Page 199, 225

M15 – बोलो

M30 – क्या speed है अभी?

Page 205

SP – Good evening, थोड़ा timing note करेंगे?

VTS – दो minute में call करता हूँ, दो minute

Page 206

VTS – Okay, तो अभी अपनी तरफ से यह Tiger three pilot station बुलाया है

Page 207

VTS – उसको pilot station बुलाया है zero two zero zero, over

SP – Second वाला sir

Page 205

हाँ

है

Page 217

SP – Roger sir, timing बोलूं?

VTS – बोलो कितना है?

SP – करीब करीब नौ हैं

VTS – हां बोलिए

Page 239

Match नही करता

अच्छा लगेगा

Page 241

बहुत अजीब लगेगा

उसके लिए phone दिया है

Page 243

पहले क्यों नही बताया?

Page 244

साहिब नहीं, नहीं

Page 247

नहीं दिया है, लेकिन

Page 250

एक ही चीज़ पूछी है आपसे, बता के नहीं दे रहे हो आप

Page 252

SR2 – नमस्कार sir, anchorage 3 से बंदर जाना है आपका permission चाहिए

VTS – Anchorage 3 से बंदर. Okay अभी clear हो गया?

SR2 – जी सर, clear हो गया

VTS – Okay ठीक है जाओ जल्दी निकलो

SR2 – ठीक है sir

VTS – यह barge कौनसा है anchorage three के पास? VTS को report करो. Barge कौनसा है anchorage three के पास? VTS को report करो

Page 253

S – Anchorage 3 से बंदर जाने का है permission चाहिए साहिब जी

VTS – आप रूको, उधर रूको आप रूको, देखो ना traffic, देखो ना ज़रा क्या हाल है.

OP – Anchorage 3 से बंदर जाने का है

VTS – अभी Sagar port से ship आ रहा है. Clear होने दो

OP – clear होने के बाद जाउन्गा

Page 256

VTS – MPV 2 बोलो, घड़ी घड़ी तंग मत करो

MPV 9 – पास करके बाहर जाने वाला dredger कौनसा हैं MPV two, MPV nine calling

VTS – MPV nine रूको, तुमको सुनाई नहीं दे रहा pilot message दे रहा हैं, तुम इधर channel को negate करके रखा हैं

Page 261

अपना CDC लिया, उसको stamp करवाया और वापस sea पे चल दिए

Page 264

HC – वापस check करो, booking है

यह Meera का booking है. DMHS बोल रहा है. दिया नहीं इधर

Page 268

हिंद देश के निवासी सभी जन एक है; रंग, रूप, वेश, भाषा, चाहे अनेक है
बेला, गुलाब, जूही, चंपा, चमेली; फूल है अनेक किंतु माला फिर एक है

Page 289

VTS – अभी रूको dredger आ रहा हैं clear होने के बाद जाओ

Appendix 14: Transcript Notation

The transcription symbols developed by Gail Jefferson (1984) have been used in the thesis. Only those symbols have been included which feature in the transcript excerpts.

(1.0)	Numbers within brackets indicate approximate time intervals in seconds
(.)	Denotes an untimed micro pause
:	Colon denotes an extended / stretched sound
↑	Rising intonation
<u>Emphasis</u>	underscoring denotes emphasis
°	A degree sign denotes talk softer than surrounding talk
(cough)	Words in brackets describe sounds or provide descriptions

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