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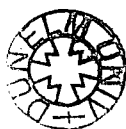
**Hoshin Kanri: An Exploratory Study
at
Nissan Yamato Engineering Ltd.**

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**Thesis submitted for the fulfilment of the
Degree of Doctor of Philosophy**

University of Durham

2001



26 MAR 2002

Rosemary Butterworth

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ABSTRACT

To date there has been no identified academic research of Hoshin Kanri in the West and the purpose of this thesis is to clarify the Hoshin Kanri process within the context of Western practice highlighting issues and identifying potential areas for future research. A review of the literature suggests that Hoshin Kanri links an organisation's strategy with its operations on a day to day basis, the thesis therefore discusses Hoshin Kanri within the theory of strategic management contributing to knowledge and understanding not only of Hoshin Kanri but of strategic management. The methodology adopted was an in depth single case study design utilising a tracer approach thus extending knowledge of a research method upon which other researchers can draw. The case study of Nissan Yamato Engineering Ltd. explores the Hoshin Kanri process within a Japanese owned company operating within a Western context held to be an exemplar of practice. A conceptual model of Hoshin Kanri is proposed, and the research suggests that emphasis in the West upon issues of culture and empowerment has obscured the need for organisational arrangements which integrate strategic concerns with day to day management at an operational level.

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Hoshin Kanri: An Exploratory Study at Nissan Yamato Engineering Ltd.

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ABBREVIATIONS

BG'96	Best in Group 1996
FLEX'21	Forward to level excellence for 2000
JETRO	Japanese External Trade Organisation
JIT	Just in Time
PPM	Parts per million
PDCA	Plan/Do/Check/Act
QCDE	Quality/Cost/Delivery/Education
QCDMS	Quality/Cost/Delivery/Morale/Safety
QCDDM	Quality/Cost/Delivery/Development/Management
QA	Quality Assurance
QC	Quality Control
QFD	Quality Function Deployment
QPD	Quality Policy Deployment
SDT	Supplier Development Team
SNP	Standard number of parts
SPC	Statistical Process Control
SPM	Strokes per minute
TQC	Total Quality Control
TQM	Total Quality Management
WIP	Work in progress

GLOSSARY

Bottleneck: the lowest common denominator which determines the speed of a process

Breakthrough: denotes large change which moves an organisation towards achievement of policy.

Business Fundamentals: key processes for an organisation which form part of daily management, directly contribute to the creation of value.

Catchball: the reiterative up, down, and horizontal communication necessary for effective determination of target and means

Co-ordination: discussion, playing catchball and listening

Control items: measures of performance through which progress towards policy achievement is gauged. Two forms of control items exist, those that measure against results and those that measure the process that produces the results

Control System: the use of the phrase control system within this context refers to the overall management of the organisation.

Cost: all costs associated with running the organisation

Cross Functional Management: evolved to clarify the roles and responsibilities of departments relative to issues which affect all parts of an organisation. In the case of Hoshin Kanri this refers primarily to the functions of Quality, Cost, Delivery and Education, although there are others. Management of targets which relate to these functions requires an approach which crosses organisational boundaries.

Daily Management: refers to the application of the principles of total quality management to all of the activities an organisation must perform on a daily basis

Delivery: refers to new product design, introduction, R&D, manufacturing product commitments and delivery of products to the customer

Education: human resource issues, training and education and issues which relate to morale

Five S's (5S's): indicate standards for housekeeping in the organisation: *Seiri*:cleaning, *Seiton*: arrangement, *Seiso*: sweeping or washing, *Seiketsu*: cleanliness, *Shitsuki*:discipline,

GLOSSARY

GOAL/QPC: an American non profit making publishing, training and consultancy organisation.

JIT: Just in time production. First developed by Toyota in the 1950s this involves a form of production characterised by making the production of what is required exactly when it is required an imperative. Buffer stocks and work in progress are kept to a minimum.

Kaizen: continuous improvement of processes through the application of the tools of total quality control, and is associated with a drive to achieve zero defects.

Kanban: a process to control material flow through an operation where goods are 'pulled' through the factory on the basis of production demand.

Lean Production: a form of production characterised by optimising resource use. Often associated with TQM it involves the elimination of waste in every aspect of an organisation's operation. Waste is anything that adds cost but not value to a product and includes both material (scrap etc.) and human (down time) elements.

Means: guidelines for achieving a target for example 'through process analysis'

Mission: encompasses a statement of purpose, a statement about how/where a firm will compete and a set of corporate values.

Morale: a measure of employee satisfaction based upon indicators such as absenteeism, levels of sickness, staff turnover, involvement in voluntary improvement schemes

Nemawashi: a process of informal discussion and consultation before the formal proposal relating to the ringi is presented. It may be seen as a process of horizontal communication.

Objective: a broadly stated target which is translated from policy

Pareto analysis: central to the data based prioritisation of TQM Pareto analysis illustrates that 80% of errors are caused by 20% of the sources of variation. Pareto analysis relies on a Pareto chart which is a vertical bar graph to identify areas for action.

PDCA cycle: the application of the PDCA cycle is central to TQM. A plan is based on policy(Plan); actions are taken according to the plan(Do); the results achieved are checked (Check); any variation from expected results is analysed and further action is taken by going back to the plan (Act).

GLOSSARY

Policy: in Hoshin Kanri this means a statement of target and the means through which this will be achieved

Quality: issues which relate to customer satisfaction and product/process quality

Quality Assurance: customer focused issues of Quality, Cost and Delivery

Quality Control Circle: a group of employees from the same work unit gather regularly to study, discuss and solve work related problems using a set of statistical tools (The seven tools) and following a general problem solving format (TQC story).

Quality Function Deployment: a means of translating customer requirements into the appropriate technical requirements for new products at each stage of the product development process.

Quality Policy Deployment: the cascading of quality policy based upon customer satisfaction throughout the organisation.

Ringi: system of decision making used in Japan. 'Rin' means submitting a proposal to one's superior and receiving his approval. 'Gi' means deliberation and decisions. The ringi system is almost always preceded by nemawashi.

Strategic intent: *"..an obsession with winning at all levels of the organisation"* (Hamel & Prahalad)

Stretch: a measure of change - indicates major change

Structure: refers to an organisation's internal pattern of relationships, authority and communication

Supplier Development Teams: in this example teams from the major customer which worked within the organisation to encourage the development of lean production practices.

Takt time: work cycle time.

Target: expected results for example 'reduction in reject rate'

TQC Themes: a focused improvement activity managed by a small team through the application of the TQC story

TQC Story: steps for problem solving based around the PDCA cycle

Vision: describes an organisation's most desired future state.

GLOSSARY

Vital few objectives: denotes those areas which are priorities for organisational action.

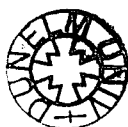
**CHAPTER ONE:
INTRODUCTION**

This thesis presents an exploratory research study¹ which seeks to give insight into Hoshin Kanri, a process which has been largely unidentified in terms of academic research in the West. Interest in the research study developed as a result of identification of practitioner and consultancy based early literature which presented uncritical and prescriptive accounts of the process.

Hoshin Kanri, translated as 'policy management' was written of in early Western literature as a development of TQC in Japan, and suggested some confusion as to the nature and form of the process; later literature suggests little development of knowledge over time. A contribution of this thesis is to clarify the Hoshin Kanri model within the context of Western practice, highlighting issues and identifying potential areas for future research.

Akao, author of the seminal text which provides some insight into Hoshin Kanri based upon Japanese experience, argues that Hoshin Kanri's unique intent is to "*integrate an entire organisation's daily activities with its long term goals.*" (Akao 1991 p xiii) The management literature generally acknowledges the difficulties that organisations face in operationalising strategy. A further contribution of the thesis therefore is that it seeks

¹ The case-study presented here is one of three studies reported in: Witcher B J; Butterworth R:(2001) Hoshin Kanri, An Innovative Process for Mobilising Company Wide Effort for Realising Top Management Goals. The Journal of Management Studies. (forthcoming July 2001)



to discuss Hoshin Kanri within the theory of strategic management giving insights into the way that this process can develop knowledge of the new models of management proposed in this area. In utilising a little used research method it provides experience of this approach upon which other researchers can draw.

Chapter Two reviews the Hoshin Kanri literature, providing an understanding of the process by exploring the way in which thinking has developed in this area. In order to provide a context within which Hoshin Kanri can be understood, the Chapter touches briefly upon the area of Total Quality Control(TQC). The literature review focuses upon the seminal work of Yoji Akao(1991). Originally published in Japan and translated for a Western audience, it provides a foundation for the construction of a conceptual model of the process.

Chapter Three presents a review of the literature within the area of strategic management, providing an overview of recent thinking with particular emphasis upon the works of Hamel & Prahalad and Bartlett & Ghoshal. The purpose of the chapter is to explore how far the new models of management presented by these authors can inform understanding of Hoshin Kanri.

Chapter Four draws upon the previous two chapters to develop a conceptual model which is used to guide the field research and provides a framework for analysis. The FAIR model which results, is a synthesis of the two areas of literature and highlights a contribution of this thesis in placing Hoshin Kanri within a theoretical context.

Chapter Five sets out the rationale for the research methodology adopted. The research presented in the thesis is a single case-study design providing an in-depth insight into Hoshin Kanri practice in Nissan Yamato Engineering Ltd (NYEL); an organisation which was held to be of particular interest because of its Japanese antecedents and its place in the supply chain of another Japanese organisation, thus providing an exemplar of practice of the process. Within the case study design a tracer approach was adopted building upon the experience of a number of researchers, providing further insights into this approach to research.

Chapter Six provides a context for the research study which follows. A brief overview of NYEL's history and ownership provides a backdrop against which the practices, relationships and events which are considered relevant to the research study can be understood.

Chapter Seven seeks to provide an insight into the Hoshin Kanri model based upon analysis of company documentation and the information gained through the research process. The FAIR model developed in Chapter Four is used as a guide for the analysis and discussion. The Chapter highlights areas which can be further informed through the studies which resulted from the application of the tracer approach.

Chapter Eight presents the first tracer study which follows the improvement of the spot welding process; an objective which formed part of annual policy over the two year research period. Interest in this objective rested upon its operational bias and the fact that this was the first time that NYEL had used a cross-functional approach to managing

such an improvement. The Chapter uses the FAIR model in the discussion which seeks to draw upon the particular interest that this objective provided to gain further insight into Hoshin Kanri.

Chapter Nine presents the second tracer study following a mid-term objective to reconfigure the shop floor to enable the organisation to introduce model changes and introduce a third car with a minimum of investment and a further development of lean production working practices. The particular interest of this objective rested in the potential complexity of activities which would be associated with its achievement. The FAIR model was used to discuss the unfolding of activities thus providing further insights into Hoshin Kanri.

Chapter Ten discusses Hoshin Kanri in light of the insights gained through the studies presented in the previous chapters. The FAIR model is used as a guide for the discussion which explores how far the insights which the research has provided can inform the practice of Hoshin Kanri in a Western context, and highlights the issues which arise as a result of this.

Chapter Eleven discusses the research findings in the light of recent thinking within the area of strategic management. The FAIR model is used to guide the discussion and to seek how far knowledge of the Hoshin Kanri process can inform and develop the models of management presented by Hamel & Prahalad and Bartlett & Ghoshal.

Chapter Twelve presents the conclusions of this research study and highlights areas for future research.

Finally, a reflexive account of the research experience seeks to develop knowledge of the tracer approach providing insights based upon experience which can assist other researchers wishing to utilise this approach. The impact on the research of events as they unfolded and the issues which arose as a result of this will be discussed.

**CHAPTER TWO:
LITERATURE REVIEW: HOSHIN KANRI**

Introduction

The literature reviewed in this chapter provides a background to Hoshin Kanri and explores the way in which thinking has developed in this area. The chapter will begin by giving a brief exposition of Total Quality Management (TQM) in order to provide the context within which Hoshin Kanri can be understood. It will then review literature in the area of Hoshin Kanri examining the works of a number of authors in chronological order, focusing upon a seminal work which was translated for a Western audience at the beginning of the 1990s, and which made a significant impact upon later literature. Examination of later authors will seek to discover how far knowledge has developed within a Western context. The literature review will provide a foundation for the construction of a conceptual model for Hoshin Kanri, which will be used as a guide for the field research and subsequent analysis.

Total Quality Management (TQM)

The focus of this section is not to review the TQM literature *per se*, but to provide a brief exposition of TQM to provide the context within which Hoshin Kanri can be understood. TQM developed as a result of the Japanese drive towards competitiveness post Second World War. Given the decimation of Japanese industry, and the lack of natural resources, there was a need to find a way to compete in the global market place. Quality control as a process of identifying substandard goods post-production, grew into

a process which required that quality be in-built at every stage of the production process. This later developed to include every aspect of organisational life, and hence became Total Quality Control (TQC), recognised in the West as Total Quality Management (TQM). The transfer of TQC to the West, and the varying degrees of its success was the focus of much of the literature across the management fields throughout the 1990s (for example see Brannen et al 1999, Cole 1998, 1999, Kenney & Florida 1995, Wilkinson 1995, Westbrook 1995).

Total Quality Control (TQC) is an organisation-wide management process at the heart of which is continuous improvement achieved through the development of a process based understanding of the organisation, the application of the tools and principles of QC, and the self-management of work. The over-riding aim of TQC is customer satisfaction; this is the only way in which quality can be understood. Cole (1998) provides a useful definition of quality:

“Quality means maximising organisational behaviour to enhance the satisfaction of present and potential customers.” (Cole 1998 p43)

Continuous improvement in TQC is often referred to as Kaizen, a concept explained by Imai (1986):

“Organised KAIZEN activities involve everyone in a company - managers and workers - in a totally integrated effort toward improving performance at every level. This improved performance is directed towards satisfying such cross-functional goals as quality, cost, scheduling, manpower development and new product development. It is assumed that these activities ultimately lead to increased customer satisfaction.” (Imai 1986 p128))

Quality(Q), Cost(C) and Delivery(D) correspond to the quality, cost and scheduling categorisations referred to by Imai which focus upon customer satisfaction, and require a cross-functional management approach. They can be defined as follows:

Quality(Q), refers to issues which relate to customer satisfaction and product/process quality.

Cost(C), refers to and includes all costs.

Delivery(D), refers to new product design, introduction, R&D, manufacturing product commitments and delivery of products to the customer.

Quality is evidenced in organisational terms through:

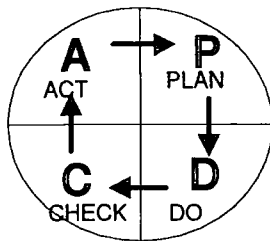
“..a market in orientation in which every effort is made to internalise external customer preferences; quality as a common corporate-wide language of problem identification and problem solving; quality as a strong corporate competitive strategy; all employee involvement in quality improvements; an upstream prevention focus; a well defined problem-solving methodology; training activities tied to continuous quality improvement; integration of quality into the corporate wide system of goals, plan and actions; emphasis on cross-functional co-operation to achieve quality improvement objectives; and anticipation of customer needs sometimes even before customers are aware of them.” (Cole 1998 p 43)

The management of quality as understood in this way has resulted in a change in the way in which organisations think about themselves. Emphasis rests upon processes which flow across functional boundaries rather than remaining within discrete functions. Interlinked organisational processes create a chain of internal customers and suppliers as

the output of one process becomes the input of another, hence the emphasis in TQC on the need to manage cross functionally. This process-based understanding of organising has required that employees work together in different ways, and that they have skills which are flexible enough to allow them to be mobile across an operation. Continuous improvement of processes requires skills in the tools and techniques which allow the self-management of processes and the application of problem-solving skills.

Central to continuous improvement as part of TQC is the concept of the PDCA cycle. The PDCA cycle is applied as a way of working at every level of an organisation to ensure continuous improvement as processes are continually evaluated and refined. This can be seen in figure 2.1

Figure 2.1 The PDCA Cycle



Plans are made (P), implemented (D), results are checked (C), where necessary corrective action is taken to bring the plan back on line (A), and the cycle begins again. Within the PDCA cycle the TQC Story is used as a problem solving process. Choosing a theme, understanding the current situation, setting a goal, causality analysis and planning improvement measures are stages of the process which fall within the **Plan** stage of the cycle. Tentative implementation of the improvement measures fall within the **Do** stage. Evaluating results is the **Check** stage, while formulating an improvement proposal is the **Act** stage of the cycle.

To assist in the statistical control of processes the Seven tools of TQC (check sheet, line chart, Pareto chart, flow chart, histogram, control chart and scatter diagram) were applied. These were later supplemented by what became known as the Seven management tools which were an aid to planning and analysis (the affinity diagram, the interrelationship diagram, the tree diagram, the matrix diagram, matrix data analysis, the process decision program chart and the arrow diagram).

Understanding of TQC in the West developed into the lean production approach to organisational management (Womack et al. 1990), the exemplar of which is held to be Toyota. TQC is central to this approach to management:

“The key success factor of Lean Production is low cost, high quality manufacturing offering a wide variety of models and functions continuously improved through rapid product development cycles. The main organisational arrangements to achieve this are TQM, flow-based plant layouts, trust-based supplier networks, inventory management with JIT, employee involvement in continuous improvement through Quality Control Circles and cross-functional product development teams.” (Lillrank 1995 p 973)

Lean production is characterised by optimising resource use, and it involves the elimination of waste in every aspect of an organisation's operation. Waste is anything that adds cost but not value to a product and includes both material (scrap etc.) and human (down-time) elements. One of the elements of lean production is Just in time (JIT) production. First developed by Toyota in the 1950s this involves a form of production characterised by making the production of what is required, exactly when it is required, an imperative. Buffer stocks and work in progress are kept to a minimum.

This is supported by the implementation of Kanban, which is a process to control material flow through an operation where goods are 'pulled' through the factory on the basis of production demand. This very brief overview of TQC will inform understanding of the Hoshin Kanri process.

Hoshin Kanri

A commonly found translation of Hoshin Kanri is: Hoshin as 'policy' or 'target and means', and Kanri as 'planning' or 'management or control'. The word *Hoshin* is composed of two Chinese characters: *ho* and *shin*; *ho* meaning method or form, and *shin* meaning shiny needle or compass; *Kanri* meaning management or control. Taken together the two words mean a 'methodology for strategic direction setting'. Translation in this form is to be found in literature in this area (for example see Akao 1991, King 1989, Shiba 1993, Soin 1992). A variety of differing terms have been adopted within a Western context and the rationale for this reflects commentators' attempts to promote an understanding of Hoshin Kanri acceptable to a Western audience. Such terms include: policy deployment, management by policy, policy control, Hoshin planning and managing for results. Given the confusion which may arise as a result of this proliferation of terms, in subsequent discussion of specific works for the purpose of this thesis the term Hoshin Kanri will be adopted.

Hoshin Kanri originated in Japan as early as the 1960s although it remained unrecognised by Western observers and managers until the late 1980s. Practice of Hoshin Kanri is first documented in the case of Bridgestone Tire Company, winners of the prestigious Deming Prize, which in 1965 published internally *The Hoshin Kanri*

Manual (Akao 1991). At about the same time Komatsu developed a Hoshin Kanri process which proved to be influential in the early literature, and Toyota in 1965 implemented "Policy Control" recognised as Hoshin Kanri (Nemoto 1983).

Organisations identified as using some form of Hoshin Kanri in the West include AT&T, Digital, Hewlett-Packard, Nissan and associated companies, Philips, Procter & Gamble, Rover and Xerox. Anecdotal evidence indicates that practice in America is more widespread than in Europe or the UK.

The Early Literature

King

Interest in Hoshin Kanri in the West began with the publication of a book in 1989 by Bob King (King 1989). This followed a trade mission undertaken by GOAL/QPC¹ to Japan in 1988, which found that the only system commonly operated by each company was that of Hoshin Kanri. King adopting the term 'Hoshin planning' suggested that this was the means through which successful organisations orchestrated and maintained change:

"Hoshin planning (Hoshin Kanri) helps to control the direction of the company by orchestrating change within a company. This system includes tools for continuous improvement, breakthroughs and implementation. The key to Hoshin planning is that it brings the total organisation into the strategic planning process, both top-down and bottom-up. It ensures that the direction, goals, and objectives of the company are

¹ GOAL/QPC was founded in 1978 as a non-profit organisation in Massachusetts to assist regional job development. It expanded to take on a training and consultancy role specialising in quality related issues

rationally developed, well defined, clearly communicated, monitored, and adapted based on system feedback." (King 1989 Glossary)

This definition suggests a limited understanding of the importance of active participation within Hoshin Kanri, and this is reflected in King's definition of catchball which he argues is one of the seven major principles upon which Hoshin Kanri rests. The concept of catchball had not previously been identified within the TQC literature and King defines it as:

"A term that refers to the fact that communication up, down, and horizontally across the organisation must sometimes go from person to person several times to be clearly understood." (King 1989 Glossary)

King fails to explain the catchball concept in terms of practice and associated issues, and the definition suggests a passive process of communication, the purpose of which is the development of understanding; later discussion will suggest a much broader role for this concept. The other principles of Hoshin Kanri suggested by King are: participation by all managers; individual initiative and responsibility; focus on root causes; no tie to performance appraisal; quality first; and focus on process. The majority of these principles are common to TQC and can be found in the work of Deming (1986) (understanding and practice of TQC was just beginning to develop in the West at this time), and their re-iteration suggests confusion by King between TQC and Hoshin Kanri. King presents Hoshin Kanri as primarily a vertical activity which is distinct from cross-functional management; later discussion will show that the importance of cross-functional management as part of the Hoshin Kanri process remained largely

unrecognised in Western literature. While arguing that Hoshin Kanri should overcome problems experienced using other strategic planning systems, King discusses Hoshin Kanri within the context of TQC rather than strategic management.

The majority of King's work is dedicated to an explanation of the application and use of the tools of TQC within Hoshin Kanri, and there is scant consideration given to the rationale for its development or the issues which may arise as a result of implementation. This probably reflects the level of knowledge in this area, and the aim of the text in introducing a new practice within the context of TQC to a Western audience. As the first dedicated Hoshin Kanri text in the West, King's book is widely cited, and its contribution in bringing this topic area to the public domain is acknowledged.

The influence of King was apparent in the only identified piece of work in the West which makes claims to be based upon research. Published by GOAL/QPC, the method and depth of the research upon which the report was based is unclear. Direct contact with three American companies; Hewlett-Packard, Florida Power & Light (FP&L) and Procter & Gamble, and consultation with two Japanese experts (one of whom was Yoji Akao whose work will be discussed below) are cited as the grounds for the research claim.

The generic framework for implementation proposed is discussed within the context of TQC, and is seen as a system which allows an organisation to plan and execute strategic organisational breakthrough. What is proposed is a superficial view of Hoshin Kanri which pays minimum attention to organisational or other issues which may arise as a

result of implementation. The report acknowledges its own limitations and, given the dearth of published material and the very small number of identified companies attempting to develop Hoshin Kanri in the West, its contribution rests in its attempt to provide a clear exposition of practice for a practitioner audience.

Akao

The seminal text within this area was edited by Yoji Akao, a Japanese engineer and academic: "*Hoshin Kanri: Policy Deployment for successful TQM.*" First published for a Japanese audience in 1988, and subsequently translated in the West in 1991, it is widely cited by King, who played a major part in its translation. Akao does not lay claim to a piece of academic research, but combines a series of individually published papers from a number of Japanese academics and practitioners covering issues pertinent to Japanese practice at that time, based upon observations gleaned from working closely with Japanese engineering companies.

"Our discussions of some of the problems recently encountered by companies implementing Hoshin Kanri may be of particular help.." (Akao 1991 p xvii)

The attention paid to Akao's work in this thesis reflects its influence on subsequent literature, and an attempt is made here to make explicit the themes which emerge, outlining a process and model against which later works can be compared.

Akao's text does not easily translate for a Western audience; the contribution of chapters from a number of authors results in repetition and a lack of fluidity. The text presents a mixture of tools and techniques such as the 'seven tools of TQC', and draws upon examples from organisations with which the authors had contact. Emphasis is

placed upon the Hoshin Kanri process developed by Komatsu which was prominent in Japan at that time.

Akao's knowledge of the process is firmly rooted in an engineering environment, but Hoshin Kanri as proposed is a generic model for application in any organisation. Akao argues that an organisation must develop its own process based upon a foundation of TQC principles:

"Merely copying the practices of other companies will often lead to failure. Each company has its own reason for the way it does things. That is why it is important that a company base its terminology and methods on QC-like controls and improvements."

(Akao 1991 p40)

The case studies presented in the text are all based in a manufacturing and engineering environment, and relate to companies of different size and complexity.

The translation of Hoshin Kanri adopted in Akao's work is that of 'policy deployment'. The term 'policy' is used in its broadest sense to encompass both 'target and means'; a 'target' is a measurable objective derived from policy, and 'means' clarify the specific steps for the achievement of the target. This is in direct contrast to the narrow understanding of policy in the West which refers to a top down directive, and 'target' which refers largely to numerical operational objectives. Deployment relates to a process of devolving the targets and means throughout the organisation.

Hoshin Kanri is defined as:

“all organisation activities for systematically accomplishing the long and mid-term goals as well as yearly business targets which are established as the means to achieve business goals. In many cases it is used for yearly targets.” (Akao 1991 p47)

This definition suggests a management process which encompasses the gamut of activities relating to the strategic management process, and is more in line with the translation of Hoshin Kanri as a ‘method for strategic direction setting’. As such this is much broader than the meaning implicit in the term ‘policy deployment’ used by Akao who recognises the limitations of his work in focusing upon the deployment process.

Hoshin Kanri clarifies and manages improvement of priority issues which allows an organisation to break away from the status quo in its response to changing competitive situations and Akao argues that its unique intention is the integration of long and short term objectives, and its importance is that:

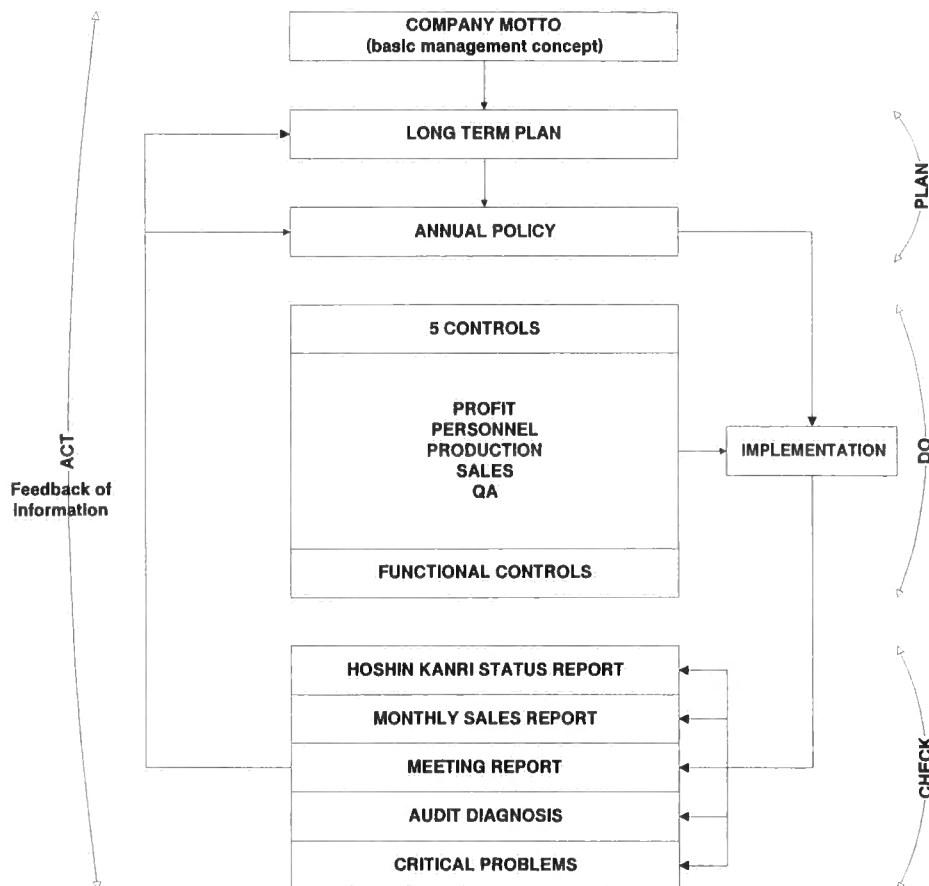
“It clarifies specific annual target policies derived from the long and medium term policies that encompass the long term visions of the company. It strives to achieve targets through action plans intended to improve the control system. These action plans are then deployed for their targets and their policies.” (Akao 1991 p4)

‘Control’ in Japan means ‘management’, and ‘system’ refers to co-ordinated processes.

In referring to a control system in a Japanese sense Akao is describing management of the whole organisation, and this can be seen with reference to figure. 2.2 below which details the overall control system at Bridgestone Tire Company.

The figure illustrates the way in which the PDCA cycle is applied to the management of the whole organisation. Annual policy is derived from the long-term plan, based upon the Company Motto, the resulting plans are implemented and checked through various review processes and then revised accordingly. Additionally management of activities relating to profit, personnel etc., are implemented alongside of those activities derived from annual policy and are checked and revised in the same way.

Figure 2.2 Overall control system at Bridgestone Tire Company



Source: Akao (1991)

Akao's Ten Step Hoshin Kanri implementation

The prescriptive 10 Step approach to Hoshin Kanri implementation which is proposed by Akao provides a model of the process which can be used as a foundation for research

in this thesis. The steps outlined below give insight into the process and highlight issues which later literature may resolve.

Establishing annual policy

Steps 1 to 3 are akin to the organisational planning process which may be operative in any organisation, and relate to the determination of longer-term policies establishing the context from which the organisation's annual policy can be derived.

Step 1. Establish a company motto, quality policy, and promotion plan

Step 2. Devise long and medium term management strategies

Step 3. Collect and analyse the information

Activities which relate to these steps of the process appear to remain firmly within the remit of senior management. The company vision or purpose which is not noted within the steps is expressed as a general guideline and tends not to change very often, the management concept or motto which results from this is an annual statement.

Quality policy focuses upon issues which relate to customer satisfaction and which are expressed in terms of Quality, Cost, Delivery and Education (QCDE). QCD issues are central to TQC, the additional categorisation is Education (E), which refers to human resource issues, training, education and morale issues. Long and medium term policies are derived within the context of the organisational vision.

Step 3 relates to information which reveals the current status of the organisation across a range of performance measures, and provides the knowledge necessary to determine annual policy when compared with the organisational expectations expressed in the longer term policies. It is this step which drives the annual Hoshin Kanri process through the application of the PDCA cycle of TQC:

“At the heart of TQM is the PDCA cycle. This also forms the core of Hoshin Kanri, but the order is rearranged. In Hoshin Kanri one begins with the check cycle - PDCA becomes the CAPD cycle. Thus, checking the current status of company activity propels the Hoshin process.” (Akao 1991 pxiv)

According to Akao the PDCA cycle of TQC is central to Hoshin Kanri:

“Policy deployment (Hoshin Kanri) uses PDCA to identify critical items for breakthroughs or for improvement. The following steps are used:

- 1. Set up and deploy the target and means (Plan)*
- 2. Implement the means and solve critical problems (Do)*
- 3. Evaluate the performance and check progress towards the targets (Check)*
- 4. Standardise the results into daily controls or transfer them to re-improvement plans (Act).”* (ibid)

The first year of the long and medium-term management policy becomes the annual policy, which forms the base for actions throughout the following year. Akao argues that Hoshin Kanri is differentiated from a planning routine outside of TQM by placing annual policy within a broader temporal framework:

“Policy deployment (Hoshin Kanri) as part of TQM should be distinguished from annual policy and plan making by its embrace of long and medium term management plans, which are the foundation of an annual policy and plan.” (ibid p18)

The vision and long term plans of the organisation set the context within which annual policy is established. Short-term plans are translated from, and managed with reference

to, longer term plans. What differentiates these stages from other annual planning processes is the focus upon quality policy, and the application of the principles of TQC which are used to focus upon critical issues for the organisation through a process of prioritisation. This focus must occur at each organisational level:

"In QC we stress the importance of concentrating on a few priority items, this holds true for the subject under discussion. At each level of position he holds, a responsible employee must learn to identify the most important issues for the year, and place emphasis on a few projects which must be implemented." (Nemoto 1983 p47)

The scale of the change which results from Hoshin Kanri is step change; a change which signifies a break away from the status quo. Organisational action must go beyond what is understood to be achievable given current resources, to what is necessary for organisational success:

"The target is set up from two aspects: necessity and achievability. Necessity takes priority. For example a target of being in the black must be created when a company is in the red.... Means are determined from two aspects: effectiveness and efficiency. Effectiveness always takes priority. they need to be based on data." (Nemoto 1983 p88)

Effectiveness is about doing the right thing, while efficiency is about doing a thing in the best possible way. This point had been made by Nemoto within the context of discussion of TQC based upon experience with Toyota:

"...goals must be determined through necessity alone. This is so because whatever goals there are which are necessary for management success, they must be attained." (Nemoto 1983 p88)

In practice the freedom of organisations to carry out Steps 1 and 2 will be affected by the context within which they operate, the relationships that they have within the parent company to which they may belong, or the position that they have in the supplier chain. This will be illustrated by the case study to be explored later in the thesis.

Deploying annual policy

Steps 4 to 7 utilise the annual policy, derived as the first year of the medium term policy, to manage organisational activities through the translation of targets and means which result in policies for each part of the organisation.

Step 4. Plan the target and means

Step 5. Set control items and prepare a control item list

Step 6. Deploy the policy

Step 7. Deploy the control items

Within this context targets are anticipated results, and means delineate the actions taken through which targets can be achieved. Central to the establishment of targets and means is the application of the concepts of quality control (QC) which apply the Paretian principle to ensure that data based priorities become the focus for action. Managers use annual policy to determine targets and means which are appropriate to them, these are then passed down the organisation and higher level means become the focus for next level managers to determine their targets and means; this requires repeated co-ordination between different organisational levels:

“The policy plan needs to be made in a top to bottom manner. That is those jobs at the top must exhibit more leadership. To this end, repeated co-ordination of top to bottom

policy plan drafts (especially strategic level target setting), bottom to top drafts (especially setting of conservative lower target values), and eventually final decisions by the president or a senior executive are necessary.” (Akao 1991 p7)

It is implicit within the text that the levels within the organisation at which the translation of targets and means is occurring remains with management positions:

“Normally, everyone - from managers to group leaders - establishes their own targets and means, which are based on their own responsibilities and achieved through joint effort with their staff and subordinates” (Akao 1991 p13),

and the process through which the development of targets and means occurs results in a close interlinking which Akao argues is central to the organisational alignment which is one of Hoshin Kanri's differentiating features:

“It is a means to pull together the forces within a company and to unite the minds internally (co-ordinate the vectors), to perpetually improve its performance by adjusting quickly to changes.” (Akao 1991 p174)

The alignment ensures that organisational activities are focused towards achievement of the same end, which optimises resource use and enables the whole organisation to respond to changing situations when necessary. However, the degree of freedom and the nature of involvement that individuals at lower levels of the organisation have in the translation of targets and means is unclear as plans become more detailed and specific lower down the organisation. This increased detail and specificity may leave little choice over alternative courses of action, thus giving rise to communication of a prescriptive implementation plan:

"The lower the job classification the more detailed and specific the plan will be."

(Akao 1991 p41)

Given the level of specificity of the plan this raises the question as to the extent and degree to which an understanding for the individual of the link between their work and the organisation's longer-term policy is important, and how far it can be achieved in practice. This in turn raises the question of the way in which organisational alignment can be achieved. Akao stresses the importance of the development of organisation-wide understanding:

"A policy (target-means) must be well understood by all employees before it can be thoroughly integrated in the company. An understanding by each employee of the relationship between his or her work and company targets is also necessary" (ibid),

suggesting that it is in the development of this understanding that a context is provided within which individuals can situate their work, giving a clear guide to organisational priorities and hence providing a focus for prioritisation of individual activity. This suggests that developing this understanding at lower organisational levels is the way to achieve alignment of activities.

Understanding is achieved through the process of co-ordination of the translation of targets and means:

"An important feature of policy deployment is co-ordination among all levels at the planning (set up stage) for the target-means. This assures uniformity of methods used, a common understanding of upper level policy, and participation by lower levels." (Akao

1991 p78)

In defining co-ordination Akao identifies the concept of catchball:

“Co-ordination really means discussion, playing catchball and listening” (ibid p31),

but the definition of the concept is relegated to a footnote:

“Catchball refers to the reiterative up, down, and horizontal communications necessary for effective determination of target and means.” (ibid p9)

The lack of substance in the text to suggest the structures to facilitate this process could reflect the assumption that the Japanese audience for whom Akao was writing would need no further explanation. Within a Western context, however, the extent and nature of participation of individuals at lower organisational levels in the establishment of targets and means, and the management of the co-ordination process, particularly the role of catchball within that, highlight issues for further enquiry within this thesis.

Associated with the target and means which form the annual policy are control items. Problems associated with the establishment of control items formed one chapter of the text as Akao reports that this issue was of some significance to practitioners in Japan at that time. Control items would be more easily understood in a Western context as performance measurements; there is, however, a significant difference.

In Hoshin Kanri control items are established as measures through which progress towards achievement of a target is monitored, and they emerge as a result of the application of the PDCA cycle during the establishment of policy and associated plans; they are inextricably linked to the target and means and are established by the individuals involved in the target/mean setting process. They can be further subdivided into those control items that measure the result of the activity associated with the means,

and those that measure the process which produces the result associated with the target. The importance of distinguishing between control items which check the process and those that check the result was emphasised, as it is in this respect that the fundamental difference between policy deployment and management by objective becomes clear.

"The concept is based on management by process rather than objective." (Aka0 1991 p70)

Having established targets, means and control items the next two steps require their deployment throughout the organisation, and again the process of co-ordination is highlighted:

"Deployment of the policy plan (target and means) requires thorough co-ordination of all job classifications within each department and among related departments." (Aka0 1991 p41)

The deployment of targets, means and control items occurs vertically through departments, but for those targets which require co-operation across departments it is necessary to deploy cross-functionally. The way in which these policies were deployed and subsequently managed through the organisation is unclear, and highlights another area for enquiry.

The extent to which co-ordination of deployment as outlined in Steps 6 and 7 is the same as in the previous two steps, remains unclear. The text leaves some confusion regarding the distinction between the activities which occur as a result of the establishment of targets, means and control items in Steps 4 and 5, and the deployment of the same in Steps 6 and 7. Questions arise as to the nature and degree of involvement of organisational actors and the outcomes at the completion of each of the steps.

Implicit within the discussion is that development of the annual policy as explained in Steps 4 and 5 is restricted to management levels within the organisation, and what results are a series of functional (QCDE) and departmental policies.

The deployment process as explained in Steps 6 and 7 involves everybody, and appears to result in the development of more detailed departmental or individual implementation plans. Given the increased specificity of plans as targets and means are deployed down through the organisation questions arise as to the degree to which plans would be open to change in light of discussions between different levels, and the degree of freedom which exists to determine individual action at lower levels during deployment in Steps 6 and 7, as opposed to the development process in Steps 4 and 5.

Implementing annual policy

Step 8. Implement the policy plan

Akao has little to say about the implementation of the policy plan arguing that this is largely determined by the culture and purpose of the company (Akao 1991 p55). There is an implicit assumption that once the process has reached the implementation stage success will naturally follow. The factors which may affect implementation and the issues which may arise for the organisation as a result of this are not discussed. This assumption could reflect the belief that the result of maximising organisational participation in the preceding steps will result in automatic implementation. This highlights an issue for the research in exploring the degree to which participation occurs, the form it takes and the impact upon the process. A further issue relates to the way in which the various actions which arise as a result of the policy deployment

process are integrated. For example how are departmental targets managed alongside of daily work?

Reviewing annual policy

Step 9. Check the results of implementation

Step 10. Prepare the status report for implementing Hoshin Kanri

Steps 9 and 10 involve the review of progress of policy deployment, and there are two aspects to this. The first is action-centred, checking the results of implementation through the application of the PDCA cycle at every organisational level on a continuous basis; this will determine appropriate corrective action based upon data analysis where expected results are not being achieved. Critical to this is the understanding that in reviewing targets the process which produced the results is the focus of any corrective action, not just the results themselves. Quarterly and annual reviews feed back into the planning process for the next period.

Special attention is given in the text to top management diagnosis which involves senior management evaluating the extent to which the top level annual policy targets have been achieved. This high profile event in a Japanese organisation requires direct communication with individuals at all levels, and according to Akao fosters the development of good relationships. The process is iterative and feeds back into Step 3 above (Akao 1991 p57). The purpose of review is to allow changes to be made to courses of action or policy:

“A policy plan should not be rigid. It should be revised as needed, depending on changes in the economy, the market or the company itself.” (ibid p37)

The process of review implies that the policy deployment process as outlined by Akao is cyclical, and the importance of review in driving the cycle is stressed.

The second form of review is to do with development of Hoshin Kanri, where an organisation seeks to continuously improve the process. Step 10 involves the compilation of a report which details the current status of progress towards achievement of targets at each level of the organisation. Essentially this is reporting on the PDCA of the annual policy, and forms a base from which decisions will be made for future policy.

Akao presents a prescriptive approach to the implementation of policy deployment but does not suggest an explicit framework of essential principles upon which policy deployment rests. Areas that receive particular emphasis in the text include the relationship of policy deployment within TQM, with particular reference to daily management and cross-functional management. Cross-functional management and the central role of TQM in Hoshin Kanri requires brief discussion.

Cross-functional management

Akao defines cross-functional management as:

“Control activities that include planning for individual business elements like quality, cost, and delivery from a company-wide (or business group) point of view.” (Akao 1991 p47)

Cross-functional management evolved in Japan to integrate issues which were delineated as functional (such as Quality, Cost, Delivery and Education (QCDE) issues)

into the departmental activities of the organisation, and to clarify lines of accountability and responsibility. The perception held by Akao was that cross-functional policies were more difficult to manage than departmental policies, and he argued that this was particularly the case in Japan where vertical organisation is more closely understood (Akao 1991 p48).

Akao suggests that Japanese practice is based upon a structure of functional committees which determine functional policies, particularly those based upon QCDE from which targets and means are translated. These were in turn translated into relevant targets and means which were then built into the annual departmental policy:

“These (cross-functional targets/means) are then implemented along with the daily management and Hoshin activities of each department and the results are then evaluated throughout the company so that further action can be taken when necessary.”

(ibid p47)

This gives rise to some uncertainty as it suggests that at a departmental level three types of activities are being managed; functional activities relating to QCDE targets, departmental activities relating to targets derived from annual policy and routine activities which arise through daily management. This appears to be borne out by figure 2.2 which depicts the overall control system at Bridgestone Tire Company. This highlights an area requiring clarification through the research alongside those issues which arise through attempting to align cross-functional targets with departmental targets, and the way in which the resulting issues may be addressed. The organisational

structures which are required to manage cross-functionally remain unclear and are the focus for further enquiry in this thesis.

Hoshin Kanri and Total Quality Management (TQM)

The title of Akao's book suggests a relationship between TQM and Hoshin Kanri: "*Hoshin Kanri: Policy Deployment for Successful TQM*" (Akao 1991). Throughout the 1990s this approach in discussing Hoshin Kanri as part of TQM continued, as evidenced by its inclusion in dedicated TQM texts (for example: Dean & Evans 1994, Ishikawa 1990, Shiba 1993, Soin 1992). There is brief discussion of policy deployment in the seminal work of Imai (1986).

The tools of QC are central to Hoshin Kanri, however the two are not to be confused:

"..... policy deployment (Hoshin Kanri) is not the same as QC rather it uses the concepts and methods of QC to solve problems in its role as part of TQM." (Akao 1991 p18)

There is evidence of confusion between TQC and Hoshin Kanri as suggested in earlier literature, and a fuller understanding of Hoshin Kanri relative to TQC requires an explanation of its relationship to daily control. In this context control is taken to mean management.

Hoshin Kanri and Daily Management

Daily management is defined as:

"..all the activities that each department must perform for itself on a daily basis that are necessary to most efficiently achieve their business goals. These activities are the most fundamental of business management." (Akao 1991 p47)

In an attempt to distinguish between daily management and policy deployment (it would appear that this was an issue which was causing some confusion in Japan at the time the text was written) Akao drew the following analogy:

“Daily control (management) is like paying attention to one’s health everyday. Daily health controls include rising early, retiring to bed early, eating until you are only 80 percent full, drinking in moderation and exercising. Policy deployment, on the other hand, is like paying attention to critical events such as illnesses or surgery. It also includes long term health measures such as buying a membership in a sports club. Policy deployment identifies these critical items from among the daily control items and improves them.” (Akao 1991 p46)

Daily management based upon TQC results in continuous incremental improvement, and involves the self-management of processes through the application of the PDCA cycle. Managing in this way ensures that day-to-day activities are under control and, according to Akao, related activities account for 75-95% of time. Hoshin Kanri is effective only when daily control is performed correctly:

“..policy deployment (Hoshin Kanri) involves the handling of priority problems and the efforts to break away from the status quo. In short, the attempt to introduce changes in the current (daily) management system constitutes Hoshin Kanri or policy deployment, This means that with daily management as the base, important issues would be taken up and addressed as policy deployment.” (Akao 1991 p164)

While drawing the distinction between daily control issues and Hoshin Kanri issues Akao has little to say about how the two may be integrated in the day-to-day management of the organisation:

"Policy deployment (Hoshin Kanri) is a problem-solving activity used to assign priorities to management tasks. Daily control can be called routine work activity. Both of these are performed simultaneously at each department or section." (Akao 1991 p105)

There is a suggestion that an interface of control items for daily management and Hoshin Kanri will facilitate the daily control/Hoshin Kanri integration.:

"..you use both types of control items to check the progress of the process while solving critical problems during the implementation stage." (ibid p67)

Akao's work suggests that Hoshin Kanri is a framework for the management of the whole organisation that has developed in response to the changing organisational needs which have arisen as a result of the changed way of working that the application of TQC principles and practices has brought about. It facilitates an organisation's achievement of its annual policy within the context of a longer term vision, and requires a focus upon process rather than results. The application of the tools and techniques of TQC identifies those priority issues which require focus through organisational alignment to bring about improvements which are a break away from the status quo. The basis for Hoshin Kanri is argued to be daily management and, while utilising the tools and techniques of QC, it is different.

What follows is a review of later literature to see how far this has addressed those issues raised by Akao's work, or developed thinking in this area.

Later Literature

From 1989 to 1992 a number of journal articles were published written from a TQM perspective (for example: Newcomb 1989, Dale 1990, Koura 1990, de Vries & Rodgers 1991, Wood & Munshi 1991, Marquardt 1992, Huston 1992, Farina 1992, Richa & Edwards 1992). Early literature failed to recognise the significance of Hoshin Kanri to the management of the whole organisation. Following three trade missions to Japan, Dale (1990), recognised that Japanese organisations were managing differently, and proposed a partial view of Hoshin Kanri:

"Quality policy deployment assists in integrating the quality improvement process with a company's strategic long term plans." (Dale 1990 p322)

In common with other authors this demonstrated a confusion over terms e.g. use of the labels Quality Policy Deployment (QPD) and Quality Function Deployment (QFD), (for example Dale 1990, Davies 1993, De Vries 1991, Richa & Edwards 1992) and added little to existing knowledge, merely reiterating Akao and King. Of note among early articles are those written by Koura (1990), and Wood & Munshi (1991).

Koura's article is worthy of attention because it is based upon research in Japan through case studies, although the depth and the method through which the research was carried out is not clear. The author sets out the historical development of Hoshin Kanri arguing that it evolved from the mid 1960s with the development of goals, which by 1980 had moved to the integration of goals and measures, followed in 1981 by the integration of

policy management and daily management. By 1983 there was a recognition of the need for cross-functional management, which further developed by 1989 to include long-range plans, strategic plans and project management. Koura (1990) identified a number of issues which were of interest regarding Japanese practice, and these reiterated the writing of Akao as discussed above. Koura's suggestion that Hoshin Kanri was evolving in terms of Japanese practice is reflected in a subsequent article by Kano (1993) based upon Western experience, and this reinforces interest in the same issues.

Wood & Munshi (1991), again writing from a TQM perspective, seek to explain Hoshin Kanri through the application of the PDCA cycle, utilising experience of Hoshin Kanri at Florida Power & Light (the first non-Japanese organisation to win the Deming prize for quality in November 1989). Of interest in this article is the way in which the authors ascribe four stages of Hoshin Kanri, 'Review, Revision, Deployment and Implementation' to the PDCA cycle. As with Akao, emphasis rests upon the importance of review in driving the cycle. 'Review' can be seen to equate to 'Check' which involves checking the current status of the organisation; 'Revision' equates to 'Act' which re-evaluates the vision, long and medium term plans of the organisation from which the annual plan is derived; 'Deployment' equates to 'Plan' and is to do with the negotiation and co-ordination of plans through catchball; 'Implementation' equates to the 'Do' stage when actionable tasks are taken up by task teams. It is suggested that Hoshin Kanri is team driven:

"Powered by teamwork, Hoshin Kanri and daily control make up TQM." (Wood & Munshi 1991 p216)

This emphasis upon the formation of teams, to which specific targets are allocated by management, (as opposed to the voluntary nature of other improvement activities such as those undertaken at a local level through quality circles), and which disband on target accomplishment, gives a new insight into the way the organisation may address implementation of Hoshin Kanri.

The authors recognise the tension in aligning departmental and functional policies, and suggest that the Hoshin Kanri process requires a specific organisational structure which comprises: an executive steering committee, a policy deployment committee, departmental committees and cross-functional committees which deal with the issues of QCD. This suggests a way of organising for Hoshin Kanri as hinted at in Akao's work (Akao 1991). The authors are the first of the earlier writers to state explicitly that the number of critical priority areas addressed in any one year should be limited:

"Typically only two or three high priority areas are addressed at a time. Choosing more may result in a loss of focus and a dilution of resources." (Wood & Munshi 1991 p214)

The model of Hoshin Kanri presented by the authors reflects the Japanese influence which was evident in the model of Hoshin Kanri adopted by Florida Power & Light (FP&L) from a Japanese utilities company.

Post 1992 saw a spate of publications regarding Hoshin Kanri including dedicated books and articles (for example Collins & Huges 1993, Sheridan 1993, Cullen 1993, Duarte 1993, Kimbler 1993). The foundation for these publications remained focused

upon practice in a couple of large Western organisations namely, Florida Power & Light (Sheridan 1993) and Hewlett-Packard (Soin 1992, Babich, 1996). The Hoshin Kanri process utilised by Hewlett-Packard in the West dominated the literature. Some articles (for example Cullen 1993, De Vries & Rodgers 1991, Huston 1992, Kern 1993, Ma 1995, and Watson 1994) present practitioner views of Hoshin Kanri implementation in other organisations; only one of these (Cullen 1993) presents experience of a UK-based organisation.

The base for Collins & Hoge's (1993) book is unclear although Collins' association with the US-based Association for Quality Control (ASQC), and his advisory role in the production of Sheridan's (1993) book based upon Florida Power & Light's experience, makes it probable that this draws upon the same source. Aimed at a practitioner market it labels 'Hoshin Kanri' as 'Management by Policy' (MBP), and in common with King and Akao discusses this within the context of TQM. In contrast with other texts the issue of implementation is given more prominence meriting a full chapter on the base that:

"implementation is the only thing that really makes a difference." (Collins & Hoge 1993 p67)

The emphasis on implementation is in direct contrast with Akao's three lines of text dedicated to associated issues, and the implicit assumption within it that if previous stages are carried out thoroughly, implementation will naturally follow. This contrast of emphasis regarding the implementation issue could reflect differences between Western and Japanese approaches to Hoshin Kanri, and a lack of understanding by the authors of

the contribution of the development and deployment phases in establishing a foundation for implementation.

This emphasis upon issues of implementation was highlighted by Cobbe (1993), based upon his experience in working within Hewlett-Packard. He suggested that effective planning required the creation of ownership for implementation and that Hoshin Kanri has a key role to play in achieving this:

“Hoshin (Kanri) relies on building ownership for every part of the implementation process and managing the process through established metrics and quarterly reviews of results.” (Cobbe 1993 p100)

Later texts published in this area (Babich 1996, Bechtell 1995, Melum & Collett 1995) again originated from the US and included publications based around experience in a small number of private hospitals (Bechtell 1995, Mellum & Collett 1995). While these publications present case studies they are systems manuals presenting practitioners with a ‘How to’ approach to Hoshin Kanri. These texts are heavily influenced by Hewlett-Packard practice and GOAL/QPC.

Evident in later literature is a growing recognition of the potential role Hoshin Kanri plays within the context of managing the strategic direction of an organisation. (Cobbe 1993, Duarte 1993, Kaoru et al 1996, Kondo 1997, Mulligan et al 1996). The claim by Mulligan (1996) that Hoshin Kanri is a well known approach to strategic planning is not substantiated by either the quantity, quality or focus of the literature up to that time. Kondo (1997) suggests that in initial use Hoshin Kanri was seen as a means of

deploying annual objectives. However, once potential was realised then efforts were made to link annual objectives to the organisations' longer-term plans.

Kano (1993), writing on American industry's progress on the TQM journey and the burgeoning interest in Hoshin Kanri as part of this journey, delineated the role it played in management of the organisation's strategy:

"In general, executives deal with two kinds of strategies. The first kind, which is effective immediately after decision making, involves personnel, budgeting, or merger and acquisition. The second kind is effective only with a company wide effort, such as a quality strategy. Management by policy (Hoshin Kanri) is ideal for realising the second kind of strategy." (Kano 1993 p23)

Kano is taking a narrow operational view of the application of Hoshin Kanri failing to recognise that vertical effort can be harnessed in a way which enables strategic decisions of the first type to be deployed. This highlights an issue which the literature has still not addressed.

Bechtell's (1995) briefing to practitioners provides an exposition of Hoshin Kanri which is drawn from knowledge gained through consultation with a number of industries in the US, Hewlett Packard featuring prominently within this. Bechtell's book is a good example of the way in which Hoshin Kanri has been influenced by Hewlett-Packard practice in the West by utilising terms such as 'Vital Few Breakthrough Objectives' to denote policies translated from long term policy which have been prioritised as a focus for action in the annual policy. Bechtell portrays Hoshin Kanri as an implementation methodology:

“Hoshin planning is not a strategic planning tool; it is an execution tool. It is a system to deploy an existing strategic plan throughout the organisation. In other words, it depends on a pre-existing statement of direction.” (Bechtell 1995 p17)

This is contrary to the view of Akao who recognised that while in his own work concentration had focused upon the deployment aspect of Hoshin Kanri this presented only a limited view. In applying the PDCA cycle of control to the Hoshin Kanri process strategic decisions were informed through knowledge of the current status of the organisation.

This view is reinforced by Feurer et al, who suggests that Hoshin Kanri has a role to play in informing the planning process:

“In the face of a high level of uncertainty and change there is a need for a dynamic approach in which strategy formulation and implementation are carried out simultaneously.” (Feurer et al 1995a p4)

Of note in this article is the appreciation of contextual influences which may affect implementation of Hoshin Kanri. The article describes the process within the context of a large global organisation (again based upon Hewlett - Packard experience), and suggests that there can be a balance between the need for strategic direction at a corporate level and responsiveness at a local level. This balance is achieved through flexibility which rests upon a need for effective communication and co-ordination within a structure and culture which facilitates dynamic change. The role of individuals within the structure becomes much less well defined and far more flexible.

St Lawrence & Stinnet (1994) also discuss Hoshin Kanri within the context of strategic management arguing that its application overcomes the shortcomings of previous strategic planning processes. There is a growing trend, as identified by practitioners, of a move towards implementation of Hoshin Kanri in service and non-profit organisations (for example Heverly & Parker 1993, Hyde & Vermillion 1996).

Summary

There has been a growing interest in the subject of Hoshin Kanri over the last decade. However, a review of the literature over that same period generates the impression that while it is being talked about in different ways, these differences are superficial and do not represent a development of knowledge of the process. This lack of development results from the dearth of research based studies and the uncritical approach of the available literature. The literature generally is dominated by consultants and uncritical practitioners. The former, while offering the allure of 'breakthrough improvement' for an organisation, offer few insights into the sorts of issues which may arise and the implications of these for organisations (for example Babich 1996, Cowley & Domb 1997, Eureka & Ryan 1990, Mellum & Collett 1995). The latter offer anecdotal reports based upon experience within their own organisation. The best of these (for example Bechtell 1995, Feurer et al 1995, Kaoru et al 1996) give some insight into the form that Hoshin Kanri may take, but comparison of early articles, say Wood & Munshi (1991), with later articles, say Smith (1997), demonstrate clearly the lack of progress made in developing knowledge in this area.

There are two identifiable streams within the literature which depend upon the source of the publication. Hewlett-Packard experience dominates and it has been heavily promoted by publications which have emerged from GOAL/QPC. This has given rise to a different view of Hoshin Kanri to that which has emerged from other organisations, namely Florida Power & Light, and Japanese organisations such as Toyota. Hewlett Packard's process was initially influenced by experience in the Japanese subsidiary Yokogawa Hewlett-Packard. However, development of the process in the West, particularly in the US, has resulted in a number of significant changes of emphasis. Florida Power & Light's (FP&L) model of Hoshin Kanri was based upon a process in place at a Japanese utilities company, and while the organisation became very high profile because it was the first non-Japanese organisation to win the Deming prize in 1989, its influence appeared to diminish. Cole(1998) suggests that American companies were not prepared to learn directly from the Japanese experience and cites the example of Florida Power & Light:

"By the early 1990's FP&L had lost its lustre. It came to be widely seen as the company that had learned too much from the Japanese without sufficiently adapting that learning to US conditions."(Cole 1998 p56)

This could go some way to explain why the two streams of Hoshin Kanri literature emerged throughout the 1990's and why FP&L appeared over time to be marginalised.

The influence of Hewlett-Packard was evident in the change in the way in which Hoshin Kanri was talked about. The application of QC tools to highlight critical priorities for organisational action (Akao 1991), later developed into two or three priority areas (Wood & Munshi 1991), then became the Vital Few Objectives. The need to 'move

away from the status quo' as outlined in Akao, became a promise of 'breakthrough change' (for example Bechtell 1995, King 1989, Soin 1992, Cowley & Domb 1997). The use of the word 'policy' is generally replaced with the word 'plan' (for example Soin 1992, Babich 1996, Bechtell 1995), thus losing the very specific meaning of policy in Japanese practice as target and means, and clouding the need for the close interlinking of targets and means throughout the deployment process. The terms targets, means and control items became goals, strategies and performance measures.

The concept of business fundamentals was introduced to denote those issues which were the focus of daily management as explained by Akao. This changed still further when business fundamentals came to encompass the QCDE categorisations which Akao had identified as functional concerns requiring a cross-functional management approach at the very top of the organisation. There was a change in the way in which cross-functional management was understood and written about as strategies became the determinant for a cross-functional approach:

"It is crucial that the management team determine which strategies require cross-functional teams, which consist of representatives from different functions, such as R&D, marketing, manufacturing and so on." (Soin 1992 p145)

This differs in approach from Akao who had written of targets translated from top level functional policies concerning QCDE issues which would be managed throughout the organisation through a functional committee, and which would precede departmental policy. The way in which cross-functional policies are deployed throughout the organisation remains unclear. Kano (1993) in his perspective on American TQM development spanning a period of over twenty years observes:

"I have noticed that in American organisations policy is deployed down to lower levels and finally in most cases to project teams. At the implementation stage for each project, analysis is conducted to solve problems, countermeasures are developed, and the results are replicated at different departments or sections. This process seems appropriate for American culture. In some companies in fact, the task teams execute these projects. In the case of Japanese companies, however, the team projects are deployed within the ordinary organisation; the team members come from departments and sections whose chiefs have key roles in the promotion of the policy objective." (Kano 1993 p25)

The review of the literature undertaken in this chapter has revealed that because of a lack of critical research there has been very little development of knowledge in this area; there is no identified academic research within a Western context. There are a range of issues which the literature highlighted and which indicate areas for enquiry within the research. The literature suggests that Japanese practice of Hoshin Kanri has developed organisational arrangements through which functional issues (for example QCDE) are deployed and managed, how far is this evident within a Western context? Emphasis in the literature stresses the importance of co-ordination and its role in developing participation and involvement in the establishment of policy based targets and means with emphasis upon the concept of catchball, yet there is little to inform how this is evidenced in organisational terms. There is a degree of confusion as to whether a difference exists between the development of targets and mean and their subsequent deployment. There is a suggestion that activity plans at some stage in the target and means deployment become implementation plans, and this raises the question as to the extent to which the deployment process encourages lower level participation and the

scope of that participation. There is scant attention paid in the literature to the issue of implementation of activities which translate from policy, and this gives little insight into how policy based targets and their associated activities are managed alongside of the day-to-day demands of the organisations in practice.

Given the dearth of research and the lack of progress in terms of knowledge as displayed by the literature it is the intention within this thesis to build upon the foundations as laid by Akao to develop a conceptual framework in Chapter Four. This can be used to give some structure to the field research, which will seek to address some of the questions raised in the discussion above and give direction for future research. Akao argues that the Hoshin Kanri process must be adapted to meet an organisation's context, but that it requires a foundation based upon the tools of TQC if it is to achieve its unique intention to link the long and short term considerations of the organisation. Given the trend in the later literature to recognise the role that Hoshin Kanri may have to play in the strategic management of the organisation, the next chapter will focus upon relevant literature in the strategic management field to establish if Hoshin Kanri's potential contribution to organisational strategic management has been recognised, and how far the literature may inform this research.

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CHAPTER THREE:

LITERATURE REVIEW : STRATEGIC MANAGEMENT

Introduction

This chapter begins with a brief discussion which gives a background to the development of thought in this field. Following from this the literature reviews more recent thinking, touching upon the contribution of two influential thinkers in this area Michael Porter and Henry Mintzberg. The main focus for discussion rests upon the research based works of Hamel & Prahalad and Bartlett and Ghoshal, who each identified a new model of management which is argued to be necessary for organisations competing in today's world. The aim of this chapter is to see how far recent thinking may inform understanding of Hoshin Kanri.

Background

In the 1980s writing in this field began to reflect a growing uncertainty and disenchantment with approaches to management. Globalisation, deregulation and growing uncertainty made longer term forward planning for organisations difficult, particularly using classical and prescriptive approaches which were based upon future prediction as an extension of past performance. Failure of organisations to perform was seen to rest in a failure of the strategic planning mechanism. Commentators such as Mintzberg adopted an 'I told you so' stance (Mintzberg 1994), while others such as Porter sought to defend

previous writings in the light of current experience (Porter 1996). Other writers suggested that what was occurring was a development of previous knowledge, an 'evolution' rather than a 'death' of planning (for example see Wall et al 1995).

The literature within the field generally agrees that corporate strategy developed to aid the management of the large corporation in America, which itself developed as a result of the adoption of mass production techniques (for example see Hamel & Prahalad 1989, Whittington 1993). The division and specialisation of tasks, increased automation, and the growth of the firm resulted in an approach to management of the organisation at the heart of which was an attempt to predict and control the future. Economic conditions at that time provided opportunities for growth as consumer demand outstripped the ability of firms to supply, and emphasis rested upon organisational growth (Bowman 1990). Within that context in the early 1960s the term corporate strategy came into being.

The growth of the corporation and the development of the multidivisional firm resulted in a hierarchical approach to corporate strategy, with specialised functions established to create plans based upon an extrapolation from historical data. These plans were formulated at a senior organisational level and distributed throughout middle level managers for implementation. It is well documented that some of the first notable writers in the field were Alfred Chandler (1962), and Igor Ansoff (1965). Corporate strategy was written of

as a static rather than dynamic concept, developed to reflect the hierarchical functionally based organisations of the time. A definition of corporate strategy by Chandler illustrates this understanding:

“the determination of the basic, long term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for those goals.” (Chandler 1962 p13)

Approaches to corporate strategy developed as organisations and the context within which they were operating became more complex. Most of the writing throughout the 1970s focused upon the content of strategy, that is the strategic decision itself, rather than how that decision could be brought to fruition within the organisation. The focus of the literature was upon the tools and techniques which could improve the quality of the strategic decisions made within the planning functions of the organisation.

At the end of the 1970s Michael Porter published a series of articles which proved to be influential in the field (Porter 1979,1980). Porter argued that it was necessary to understand an organisation's strengths and weaknesses within the context of the industry within which it was operating. His contribution was to broaden the organisation's perspective, shifting emphasis from a purely internally focused approach, to a consideration of the organisation within an industry (Bowman 1990).

To aid an organisation's analysis Porter presented a competitive forces framework, and developed the concept of generic strategies. The understanding gained through use of these tools resulted in a corporate strategy which would position an offering in the market place through the selection of one of a number of generic alternatives.¹

In later developments of his work Porter presented a tool which organisations could use to analyse the configuration and interrelation of activities through which competitive advantage could be achieved; this is known as the 'Value chain' (Porter 1985). The competitive forces approach to analysing industry structure and value chain analysis went beyond the broad principles found in the early writings on corporate strategy providing more structured tools and techniques to improve the strategic decision making process (Porter 1991).

Development of thinking in Strategic Management

Later commentators were critical of Porter's approach, arguing that organisational action could not be so clearly delineated (Hamel & Prahalad 1989, Mintzberg 1994). This criticism was held valid in the 1980s when Japanese organisations were successfully competing in a way which, according to Porter's proposed 'generic strategies', was impossible. Seeking to defend his position, Porter argued that the Japanese were able to compete in

¹ Porter wrote about the firm within the context of the industry within which it was operating providing a framework for diagnosing industry structure commonly referred to as the 'five forces framework.' He argued that the key to competitive success was the position organisations adopted in the market place, and proposed three generic strategies; organisations must choose one of these if they were to be successful; cost leadership, differentiation or focus (Porter 1985).

this way (on both price and differentiation), because of their operational effectiveness:

“Differences in operational effectiveness were at the heart of the Japanese challenge to Western companies in the 1980s. The Japanese were so far ahead of rivals in operational effectiveness that they could offer lower cost and superior quality at the same time.” (Porter 1996 p62)

According to Porter: *“Japanese companies rarely have strategies”* (Porter 1996), however this view is more likely to reflect a lack of understanding of the differences which exist between East and West as to the purpose of corporate planning:

“In the West, long range planning is generally used to make strategic decisions based on a set of clearly defined objectives, the highest of which are determined by the top executive himself. However, in Japan, it is simply used to clarify goals and policies of the company..... the primary purpose of corporate planning in Japan is not to formulate strategic programs for action and to implement them. Instead it is primarily to set up targets of endeavour and draw the future portrait of the company.....” (Fukuda 1988 p62)

Porter viewed the attempt to replicate Japanese success as the result of a confusion in Western organisations regarding the reason for that success. This view was reinforced by a Japanese commentator Kenichi Ohmae, who argued that:

"To many Western managers, the Japanese competitive achievement provides hard evidence that a successful strategy's hallmark is the creation of sustainable competitive advantage by beating the competition." (Ohmae 1992 p77)

According to Porter the resulting emphasis by Western organisations upon operational effectiveness could not take the place of strategy, because practices which improved operations such as TQM could be copied, but strategy should be unique :

"The pursuit of operational effectiveness is seductive because it is concrete and actionable. Caught up in the race for operational effectiveness, many managers simply do not understand the need to have a strategy.

.... The operational agenda involves continual improvements where there are no trade offs. Failure to do this creates vulnerability even for companies with a good strategy.... the strategic agenda is the right place for defining an unique position, making clear trade-offs, and tightening fit. The strategic agenda demands discipline and continuity; its enemies are distraction, and compromise." (Porter 1996 p78)

Porter did not view a drive to operational effectiveness as strategic, and accordingly it would not of itself make an organisation successful over the longer term. There was a need for Western organisations to 'catch up' in terms of efficiencies, but the move to focus internally on things like restructuring, Total Quality Management, Business Process Re-engineering etc., would not

lead to long term success because strategy was about positioning in the market place (Porter 1996). Operational effectiveness presented in this way is narrow, focusing as it does upon issues relating to quality, productivity etc. and yet Porter acknowledges that: "*The operational agenda is the proper place for constant change, flexibility, and relentless efforts to achieve best practice,*" (Porter 1996 p78), all of which are capabilities which enhance an organisation's ability to compete effectively.

The view of strategy reflected in Porter's work as something which involves decision-making at the top of the organisation, does not take into consideration the advantage which can be gained from a capability to operationalise those activities which flow from, and which can inform, the strategic decision. He also failed to acknowledge that the introduction of new working practices, which he viewed simply as means to improve operational effectiveness, would necessarily impact upon management of strategy in an organisation because they required that organisations think of themselves in new ways.

Mintzberg, a key writer in the strategy field from the 1970s, has from his earliest writings been critical of the prescriptive approach to corporate strategy developed by Igor Ansoff (1965), Kenneth Andrews (1987) and other early writers and which is apparent in the work of Porter, arguing that this approach falls far short of the reality of organisational life. In a number of his earlier articles based upon research (1978, 1979), Mintzberg began to develop the

concept of emergent strategy, arguing that classical definitions presented strategy as a perceptual phenomenon which produced explicit *a priori* guidelines, which in practice was generally not realised (Mintzberg 1978). Strategies could evolve and be observed as *a posteriori* consistencies in decisional behaviour and, as such, emergent strategy could be identified as a consistent pattern of decisions over time (ibid).

Emergent strategy allowed an organisation to adapt intended strategy in the face of changing circumstances, thus linking strategy formulation with implementation (Mintzberg 1990). There is little in Mintzberg's work which informs the reader how this transition from intended to emergent strategy may occur, and implicit is the notion that this is not a managed process, but one which occurs at the lower levels of the organisation as a result of the formulation - implementation gap. This contrasts to the Hoshin Kanri process whereby the purpose of the organisation provides the context within which short term actions are determined and modified through a participative translation process; it is a consciously managed process which is driven by the cycle of review. In this sense Hoshin Kanri manages a transition from intended to emergent strategy, and the importance of this to organisational success was reported by Pettigrew & Whipp, based upon a study of competition and managing strategic change:

"The importance attributed to linking strategic and operational change is because the process has both an intentional and emergent character. The

need is, therefore, to appreciate how intentions are implemented - and hence transformed - over time.” (Pettigrew & Whipp 1993 p35)

An examination of later literature reveals that there remains little research on how organisations may manage the strategy process in such a way that it connects to operations. One of the findings of Reid (1989) reporting on a multi year study in Scotland, was that the benefits of strategic planning are not realised unless the process is totally integrated with current operations; the means through which this could be achieved was not explored in the study. Pettigrew & Whipp (1993) observed that:

“irrespective of the strategy adopted, the key intangible asset is the capability to carry through the changes implied by the strategy and if necessary transform the strategy through use.”(Pettigrew & Whipp 1993 p3)

Further they argue that there is a need to understand how strategic intentions are implemented and:

“Not only must those intentions be broken down to actionable pieces, those components must become the responsibility of change managers, operating within appropriate structures at various levels within the organisation, clear and exacting target setting has in turn to be supported by rethought communication mechanisms and adjusted reward systems. The modification of overall visions in the light of local conditions is a major requirement...”
(ibid p35)

The focus of the study remained upon the actions of senior management and, as with Reid, the purpose of this study was not to discover the means through

which this integration occurred, but to highlight the importance of the process to organisational success.

In the early 1990s strategic management was talked about in a new way. Traditional ways of thinking of strategic planning for organisations which were operating in an external environment of continuous change, and an internal environment where there was a shift towards empowerment and self-management of processes were questioned. The literature suggested that organisations were to be rethought not as a portfolio of business units but a collection of complementary processes or core competences. This marked a new phase in strategic management :

“which deals with a strategic treatment of all the elements of the firm - people, skills, technology, information, finance - to see if they are consistent with strategy and can be more competitive.” (Bowman 1990 p13)

Hamel & Prahalad

Hamel & Prahalad (1989) developed thinking on the concept of strategic intent and stretch. In their early writing they concentrated discussion on the way in which organisations may seek to create new resources over time in a bid to achieve long-term strategic intent. The authors define this as having an ambition which is out of proportion with available resources, and which requires an organisation to have an obsession with winning at all levels. To achieve this an organisation must ‘stretch’ itself; in this sense stretch requires aiming for something without telling people how to get there. This is akin to

the purpose of corporate planning as understood in Japanese organisations (Fukuda 1988), and which is seen in Akao's exposition of Hoshin Kanri as providing the context within which individuals can situate their contribution to the organisations long-term direction.

The authors argue that strategic intent is not simply a statement of exhortation but requires an active management process that includes:

"focusing an organisation's attention on the essence of winning, motivating people by communicating the value of the target, leaving room for individual and team contributions, sustaining enthusiasm by providing new operational definitions as circumstances change, and using intent consistently to guide resource allocations." (Hamel & Prahalad 1989 p18)

As a development of the concept of strategic intent and based upon ten years of researching a number of organisational issues with senior managers in America, Europe and Japan (including Komatsu), the authors (1991) proposed two contrasting approaches towards strategic management, one of which they attributed to management within Western organisations (Model 1), the other to management within Far Eastern organisations (Model 2). These can be seen in table 3.1 below. The influence of Japanese practice and thinking is evident in Model 2. The idea of leveraging resources to reach unattainable goals can be seen to be akin to the optimisation of resources which results through alignment of targets and means at the deployment stage of Hoshin Kanri; the idea of unattainable goals equates to the idea of 'breaking away from the

status quo.' The importance of gaining consistency, and the participative role of organisation actors within this again bears a similarity to the deployment stage of Hoshin Kanri.

Table 3:1 A new management model (Hamel & Prahalad)

<u>Model 1</u>	<u>Model 2</u>
<u>(A Western Approach)</u>	<u>(An Eastern Approach)</u>
1. Emphasis rests upon trimming ambitions to match available resources	Emphasis rests on leveraging resources to reach seemingly unattainable goals
2. Emphasis rests upon a search for advantages that are inherently sustainable	Emphasis rests upon the need to accelerate organisational learning to outpace competitors in building new advantage
3. Emphasis rests on competing through a search for niches in the market	Emphasis rests upon a quest for new rules that can undermine the market leaders advantages
4. Emphasis rests upon allocation of resources to product market units in which relatedness is defined by common products, channels and customers. Each business is assumed to own all the critical skills it needs to execute its strategy successfully	Emphasis rests upon investments in core competences as well as in product market units. By tracking investment across units management works to assure that the plans of individual strategic units don't undermine future development by default
5. Emphasis rests upon gaining consistency at a corporate / business level through a need to conform to financial objectives. At a business/functional level by restricting the means through which the business achieves its strategy e.g. standard operating procedures.	Emphasis rests upon gaining consistency at a corporate/business level through a shared allegiance to a particular strategic intent; at a business/functional level through allegiance to intermediate term goals or challenges, with lower level employees encouraged to invent how these goals will be achieved
6. Emphasis rests upon reduction of financial risk through the building of a balanced portfolio of cash generating and cash consuming businesses	Emphasis rests upon a reduction of competitive risk through the development of a well balanced and sufficiently broad portfolio of advantages

The authors argued that this move to a new model of management requires that organisations develop core competences as the origin of competitive advantage:

“Western and Japanese alike, are all converging on similar and formidable standards for product cost and quality - minimum hurdles for continued competition, but less and less important as sources of differential advantage.”

(Prahalad & Hamel 1990 p5)

A core competence provides potential access to a variety of markets, makes a significant contribution to the perceived customer benefits and is difficult to imitate:

‘Core competencies are the collective learning in the organisation, especially how to co-ordinate diverse production skills and integrate multiple streams of technologies.....If core competence is about harmonising streams of technology, it is also about the organisation of work and the delivery of value.....Core competence is communication, involvement and a deep commitment to working across organisational boundaries.’ (ibid p6)

In order to support the development of core competences it was necessary for the organisation to think about itself in new ways, a corporate-wide strategic architecture was required:

“Strategic architecture should make resource allocation priorities transparent to the entire organisation. It provides a template for allocation decisions by top management. It helps lower level managers understand the

logic of allocation priorities and disciplines senior management to maintain consistency." (Prahalad & Hamel 1990 p13)

The strategic architecture is:

"... consistency of resource allocation and the development of an administrative infrastructure appropriate to it that breathes life into a strategic architecture and creates a managerial culture, teamwork, a capacity to change and a willingness to share resources. to protect proprietary skills and to think long term." (ibid p13)

The authors fail to elaborate or inform the reader on the process(es) that could support the strategic architecture, which would in turn facilitate the building of organisational core competences.

In response to the changing emphasis of the strategic management literature and to address critics of previous works, Porter developed his own approach by proposing a new dynamic theory of strategy. Within this he recognised the value of exploring the concept of core competences, but he argued that this at best could only be a partial explanation of competitive advantage:

"...the whole matters more than any individual part. Competitive advantage grows out of the entire system of activities. The fit among activities substantially reduces cost or increases differentiation. Beyond that, the competitive value of individual activities - or the associated skills, competencies or resources - cannot be decoupled from the system or the strategy. Thus in competitive companies it can be misleading to explain

success by specifying individual strengths, core competencies, or critical resources.” (Porter 1996 p73)

The stance taken by Pilkington following examination of the efficacy of the lean production model in Japanese and Western organisations falls somewhere between Porter and Hamel & Prahalad. He argues that Japanese companies have been successful not specifically because of the application of the lean production model, even though associated working practices were utilised, but because manufacturing strategy followed corporate strategy:

“The Japanese themselves have not followed the best practice approach, but rather the capability and contingency based strategy concepts of aligning production systems to corporate strategy.” (Pilkington 1998 p38)

He recognised the value of operational effectiveness, but stressed the need to align organisational action with long term vision. This required that the organisation develop those capabilities which support the strategy of the organisation.

Ghoshal & Bartlett

Sumantra Ghoshal and Christopher Bartlett reinforced the writings of Hamel & Prahalad. Acknowledging that the environment within which organisations were operating had fundamentally changed, they argued that the competitive decline of organisations was the result of an inability to recognise that the doctrine of the multi-divisional organisation was outdated, and that what was

required was a new entrepreneurial organisation which recognised the need for new organisational processes and new managerial tasks.

In a series of articles based upon five years of research in 20 large European and Japanese organisations including Komatsu and AT&T (organisations previously recognised as using Hoshin Kanri in parts of their operations), the authors further developed thinking by examining the contemporary relevance of the typology of strategy, structure and systems which has its roots in the 1920s with Alfred Sloan of General Motors :

“Those pioneers discovered that diversification benefited from a divisional structure and that tightly designed planning and control systems in turn supported that structure.” (Bartlett & Ghoshal 1994 p79)

The organisation has changed and the development of a new organisational form underlined the shortcomings of current ways of thinking:

“The great power - and fatal flaw - of the strategy - structure - systems framework lay in its objective: to create a management system that could minimise the idiosyncrasies of human behaviour. Indeed, the doctrine held that if the three elements were properly designed and effectively implemented, large complex organisations could be run with people as replaceable parts.”
(ibid p80)

The authors proposed an emerging management model which can be seen in table 3.2 below.

Table 3.2 A new management model (Ghoshal & Bartlett)

STRATEGY - STRUCTURE - PURPOSE - PROCESS - PEOPLE

SYSTEMS**Strategy:**

Strategy is designed by top level managers in a stable environment where opportunities for growth abound.

“Strategy makers view the companies they head as profit maximising entities with a narrowly defined role in a large and complex social environment.”

Structure:

The top down hierarchical structure developed to support strategy, and was the chief organising tool. Relationships tended to be vertical and resource allocation that defined strategy remained with top management. (structure) “is about allocating resources, assigning responsibilities and controlling their effective management.”

Systems:

Information, planning and control systems were used to link and control the organisations’ parts. Individuals became the ‘organisation man.’

Purpose:

Top level managers shape institutional purpose as the context within which strategy ‘makes sense’ to all employees within the organisation. This shaping involves embedding corporate ambition, instilling organisational values and giving meaning to employees work.

“Purpose is the embodiment of an organisation’s recognition that its relationships with its diverse stakeholders are interdependent. In short, purpose is the statement of a company’s moral response to its broadly defined responsibilities, not an amoral plan for exploiting commercial opportunity.”

Process:

The organisation is a portfolio of processes, the core being: the entrepreneurial, the competence building, and the renewal processes.

“the organising task - accomplished through the three organisational processes we have described - is to shape the behaviours of people and create an environment that enables them to take initiative, to co-operate, and to learn.

People:

Systems, policies and procedures are redefined to support a focus on people. Central is self monitoring and growth of vertical and horizontal networks to allow a free exchange of information.

To move from strategy to purpose:

“Corporate leaders must create a sense of community and help employees identify with the larger organisation in a way that transcends personal interests and particular responsibilities.” (Ghoshal & Bartlett 1995a p92)

The role of senior management within this is to convert the employee to a committed member of a purposeful organisation through: defining a company's objectives so that they have personal meaning for employees; getting the organisation involved in interpreting, refining and making organisational statements operational; creating momentum and sustaining commitment to the objectives. Leaders have a key role to play, but not in formulating detailed strategy, rather in providing the broad framework of purpose within which strategy is formed :

"Their objective is neither to impose a tight strategic agenda on their line managers nor to inspire them to work towards some ineffable goal. Rather, they are working to embed a clearly articulated, well defined ambition in the thinking of every individual while giving each person the freedom to interpret the company's broad objective creatively." (Bartlett & Ghoshal 1994 p82)

The research that the authors carried out suggested three characteristics underpinned this approach. These distinguished it from previous practice, and rested upon the way in which senior management managed. Senior management needed to find a way to express corporate ambition in terms designed to capture employees' attention and interest rather than in terms related to strategic or financial goals. This ambition was the product of organisational effort facilitated by senior management, and senior management were responsible for translating this into measurable activities which would provide a benchmark of achievement and a sense of momentum. The authors give no indication of how these characteristics were evidenced in

organisational ways of working. How for example would the activities translated from the ambition provide a momentum for action?

Bartlett & Ghoshal argue that the move from structure to process requires a move away from the prescriptive framework which emerged as a result of the growth of divisionalisation to a focus upon management processes:

“We will not present a new way of structuring the organisation, however, for the emerging management philosophy does not imply a single ubiquitous structural form. It stipulates, instead, a set of key management processes and the roles and tasks of managers at different levels to make these processes effective. The actual configuration of the processes themselves, and the structural shell within which they are embedded, can be very different, depending on the businesses and the heritage of each company.” (Ghoshal & Bartlett 1995b p145)

The authors suggest that these core processes are entrepreneurial, integrative, and renewal. The entrepreneurial process which is externally focused seeks to create new business through utilisation of the ability of front line managers to create initiatives, which are in turn supported by middle and senior management within the context of a corporate led mission. In this sense entrepreneurial activity is bottom up.

The integrative process requires corporate leaders to develop and embed the organisational values which create the organisational context within which the

front line managers integrate the day to day activities through management of operational interdependencies. Senior and middle management link the diverse skills, expertise and resources to support the strategic thrusts of the organisation.

The renewal process consists of ongoing continuous improvement of existing operations, and the creation of new competencies and new business which challenge the existing rules of the game. This requires corporate leaders to manage the tension between short-term performance and long term ambition, senior managers must build and maintain organisational flexibility while front line managers sustain bottom up energy and commitment.

Moving beyond systems to people requires a move away from the concept of organisational man/woman, to an 'individualised organisation', which is based upon the development and recognition of people as responsible owners of their own processes.

Central to this series of articles is the changing role of top management in creating an environment that will encourage the sort of behaviour which will allow the development of the characteristics upon which the new model of management rests. The issue of how this changing perception of 'organisation' impacts upon the detail of organisational management is unclear and leaves many unanswered questions. For example the authors argue that:

“Creating an individualised corporation does not mean stripping the organisation of all its formal systems, policies and procedures. It does require redefining them so that they support, rather than subvert, top management’s ability to focus on the organisation’s people.”(Bartlett & Ghoshal 1995 p135)

How are redefined systems evidenced in organisational terms? In terms of strategic management the authors suggest that:

“..leaders are downplaying their strategic decision making role, and delegating much of that responsibility to front-line managers, who are closer to the business. Top level managers still influence long term direction, but they recognise that they have their greatest impact by working internally to develop the organisations resources, knowledge and capabilities as strategic assets.” (ibid p135)

This suggests recognition of the importance of strategically managing all aspects of the organisation and the devolving of responsibility for management of strategy throughout the organisation within the context of a defined long term direction. Bartlett & Ghoshal further argue for a need to move away from the formal control systems associated with strategic planning systems which were unable to respond to operational changes that occurred at a weekly or even daily level. Their research had indicated that managers were working to develop organisational transparency, and an environment in which managers and employees monitored and corrected themselves.

Summary

The new models of management proposed by Hamel & Prahalad and Bartlett & Ghoshal provide a new way of thinking about the management of the whole organisation, but fail to give in-depth insights of the way in which they may be operationalised or the issues which arise as a result. Hamel & Prahalad focus upon the need for organisations to build core competences through which competitive advantage can be gained. No insight is given into the form the required strategic architecture takes to support this. Bartlett & Ghoshal focus upon the role top management have in providing an environment in which individuals within the organisation can work. The process through which this new philosophy of strategic management is operationalised in organisational life remains unclear.

Similarities can be seen between the ideas expressed here and those which the literature suggests are evident in Hoshin Kanri. The notion that top managers establish the context within which strategy is managed, the idea of organisational transparency, the devolvement of responsibility, the self monitoring of work through the organisation, the development of a control system which reconciles short and long term operational considerations, and the recognition that all of the resources of the organisation can be managed strategically correspond with this approach. The degree of abstraction of the discussion, as the focus remains upon the role of top management, does not allow any closer parallels to be made.

There is a possibility that Hoshin Kanri was used by some of the organisations which participated within the research study, particularly given that two of these organisations have been previously identified as using Hoshin Kanri in parts of their operation, and a proportion of the research organisations were Japanese, but this remained unrecognised by either set of authors.

In reality what is proposed are general guidelines, and further literature in this area has not addressed the question of how organisations may organise themselves, the form that processes may take which will help them develop this new model, or the issues which may arise as a result of its implementation. The works focus upon how top management ought to think about strategy rather than how strategy is managed in a way which acknowledges the new organisational forms which have evolved as a result of changes in ways of working over the past two decades. Emphasis remains upon strategy formulation and implementation or strategy formation, and there is little development of the work which examines the sort of strategic organising which the literature suggests is evidenced as part of the Hoshin Kanri process; for example how far could knowledge of the Hoshin Kanri process give an insight into the strategic architecture that the new model of management suggests, and which in turn supports the development of the core competencies necessary for organisational success?

The transition from classical approaches to those approaches adopted by learning organisations results in a breakdown of the

formulation/implementation dichotomy recognised in the literature (Mintzberg 1994) as implementation informs formulation. In the previous chapter, it was mentioned that Akao (1991) recognised the limitations of his work on Hoshin Kanri in concentrating upon the deployment aspect of the process. However, he did stress that the constant cycle of review which drives the process informs decisions which are made about the long term direction of an organisation; in this sense how far does Hoshin Kanri inform formulation? Most of the strategy literature is concerned with decisions at the strategic business unit level and does little to suggest how activities critical to strategy can be managed so they receive priority in daily work. How far can Hoshin Kanri bring about the necessary integration?

There has been no identified dedicated research of Hoshin Kanri within the Western strategic management literature, and the role of Hoshin Kanri in the strategic management process remains unclear.

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**CHAPTER FOUR:
HOSHIN KANRI AND STRATEGIC MANAGEMENT**

Introduction

In this chapter a conceptual model will be developed as a result of the literature review which will be used to guide the field research and to provide a framework for analysis highlighting a contribution of this thesis in placing Hoshin Kanri within a theoretical context.

Hoshin Kanri and Strategic Management

Later literature in the strategic management field as discussed in Chapter Three evidences a move in thinking about the way in which strategy is managed in the organisation; a shift which is as important as the earlier development in the literature in the 1980s when discussion of corporate strategy changed to that of strategic management. This change is evident in the seminal works of Hamel & Prahalad and Bartlett & Ghoshal, and centres around different ways of thinking about the organisation, organising and the role of individuals within this.

The literature suggests that the management of organisations is influenced by a need to think about the way in which it has redefined itself around processes rather than functions. The concept of strategic intent, and the need to recognise and develop organisational core competences in order to achieve that intent, re-focuses organisational action and requires a managing framework which is based upon a process

based view of the organisation. The shift in thinking from a strategy, structure systems view of organisation to one of purpose, process and people as proposed by Bartlett & Ghoshal reflects a similar need.

What is lacking in the strategic management literature is any exposition of how the concepts proposed are evidenced and managed within an organisational context. It is conventionally held that in the domain of strategic management there is a problem which rests not so much upon the strategy implementation gap, but on the lack of understanding regarding how to manage strategy. In general most of the strategic management literature is concerned with decisions at the strategic business unit level, and has little to say about how activities critical to strategy can be managed so that they receive priority in daily work. This stage of the process has traditionally been ignored as traditional thinking would argue that it relates to operations and not to strategy.

The models of management proposed by Hamel & Prahalad and Bartlett & Ghoshal discussed in the previous chapter do not go any further in developing understanding in this area. Review of the Hoshin Kanri literature suggests that it is Hoshin Kanri's unique intent to operationalise those activities which flow from the organisation's long term policy. However, within this literature there is a dearth of knowledge relating to how this is managed in practice. Previous discussion has acknowledged that in the ten step implementation process proposed by Akao(1991) there is very little written regarding the implementation of those targets and means which have translated from policy. Later literature in this area continues to ignore this stage of the process, Bechtell(1995) argues that Hoshin Kanri has three stages, focus alignment and review. The need to understand

how policy based activities are managed alongside day-to-day management activities remains unexplored. In proposing the four-stage model below, there is a move away from traditional ways of thinking about strategic management, and a recognition of the need to inform understanding of issues relating to the management of strategy within the organisation.

The FAIR model of Strategic Management

The Hoshin Kanri model derived from the literature and proposed below seeks to provide a research guide. Exploration of the practical application of Hoshin Kanri will clarify the model, and will attempt to address some of the issues raised previously.

The 10 Steps of Hoshin Kanri implementation as proposed by Akao can be seen to fall into a number of distinct stages as outlined below; these have been discussed more fully in Chapter Two.

1. Providing a context for and focusing organisational action

Step 1: Establish a company motto, quality policy, and promotion plan

Step 2: Devise long and medium term management strategies

Step 3: Collect and analyse the information

2. Aligning organisational action

Step 4: Plan the target and means

Step 5: Set control items and prepare a control item list

Step 6: Deploy the target and means

Step 7: Deploy the control items

3. Integrating organisational action through implementation

Step 8: Implement the policy plan

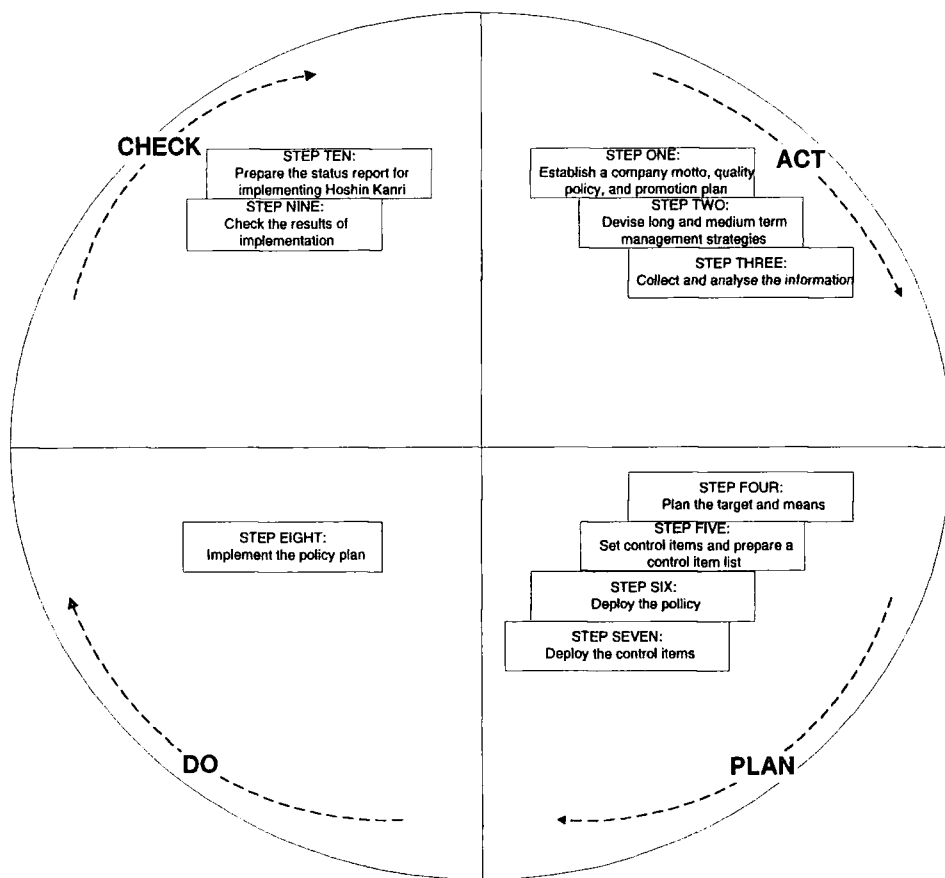
4. Reviewing the results of organisational action

Step 9: Check the results of implementation

Step 10: Prepare the status report for implementing Hoshin Kanri

This categorisation suggests a conceptual model of Hoshin Kanri as seen in figure 4.1 below. The literature suggests that the fundamental prerequisite for Hoshin Kanri is successful TQM, at the heart of which is the basic process for self-management of work called the PDCA (plan-do-check-act) cycle as outlined in Chapter Two. The four stages, planning, doing, monitoring and the stage at which corrective action is taken (where this is needed) correspond to the four stages of Hoshin Kanri.

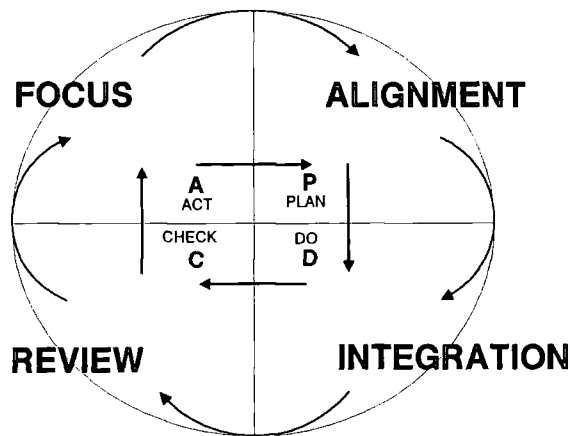
Figure 4. 1 PDCA & Akao’s 10 Steps of Hoshin Kanri



CHECK corresponds to that part of the cycle which drives the Hoshin Kanri process, and determines and feeds in the results of the previous annual policy cycle. The

information from throughout the year is rolled up the organisation and collated, and forms the basis for the status report for Hoshin Kanri. This is taken forward to the ACT part of the cycle when, within the context of long and medium term policy, the results from last year are analysed alongside traditional data upon which organisations would form their strategic plans and medium term policies. The first year of the medium term policy forms the basis for the annual policy which is the focus for the PLAN stage of the cycle. At this stage targets/means and control items are determined through a process of co-ordination and are then deployed throughout the organisation. Following deployment the interlinking targets/ means which have been translated from policy are implemented forming the DO part of the cycle.

To many observers this cycle is difficult to differentiate from traditional strategic planning. However, the literature suggests that within the cycle there exist differentiating factors which can be best described by overlaying the PDCA cycle with the organisational outcomes which are expected at each stage. This can be seen with reference to figure 4.2 below.

Figure 4.2 The FAIR model of strategic management

The ACT stage of the cycle is that which brings about organisational FOCUS.

The PLAN stage of the cycle brings about organisational ALIGNMENT.

The DO stage of the cycle brings about organisational INTEGRATION.

The CHECK stage of the cycle brings about organisation wide REVIEW.

Each of these will be explored in more detail below.

FOCUS

The focus stage of strategic management corresponds to the Act stage of the PDCA cycle, which is informed by the previous years experience, and is about the formulation and setting of the key priorities for the whole organisation. This can be seen in the model derived from Akao's Steps for Hoshin Kanri implementation as Steps 1 to 3, where long and medium term policies are formulated within the context of a company motto, and are supported by the collection of relevant data. Short-term policies are derived from and managed within the context of longer term policies.

What distinguishes this from the formulation of strategy as described within the classical and design schools of strategic management is the process of prioritisation. The importance of this is stressed by Akao(1991). The collection and analysis of relevant data allows the application of the Pareto principle which is central to organisations operating according to TQM principles. This optimises the use of organisational resources as prioritisation provides a focus for activity and the intended result is a 'change from the status quo'.

Later literature within the Hoshin Kanri field, based upon practitioner experience, talked about Vital Few Priorities, which in practice for some organisations meant no more than two or three top level targets to achieve breakthrough (a change from the status quo). In the model proposed by Hamel & Prahalad this can be seen to equate to the idea of the leveraging of resources(focusing through prioritisation), to reach seemingly unattainable goals(strategic intent or breakthrough). The model proposed by Ghoshal and Bartlett describes an organisation where it is the task of top management to shape the institutional purpose from which strategy flows. In Hoshin Kanri this is reflected in the Japanese practice of articulation and communication of vision/mission supported by organisational values from which long and medium term strategies flow. Akao stresses the importance of providing a context within which people can make sense of the work that they do in strategic terms.

ALIGNMENT

The alignment stage of strategic management corresponds to the Do stage of the PDCA cycle. In the model derived from Akao this can be seen to correspond to Steps 4 - 7,

which involve the development and deployment of the targets/means and control items that constitute policy throughout the organisation. At the heart of this phase of the cycle is the alignment of activities which translate from the annual policy with local policy and priorities. Critical to this stage of Hoshin Kanri is the process of co-ordination through which interlinked targets/means/control items are developed and deployed. Later literature in the Hoshin Kanri field, which it has been noted was mainly US consultancy based, suggested a different emphasis, focusing upon participation and employee empowerment as the means through which alignment would occur.

A correspondence can be drawn with the model of Hamel & Prahalad, who stress the need to gain organisational consistency:

“Emphasis rests upon gaining consistency at a corporate/business level through a shared allegiance to a particular strategic intent; at a business functional level through allegiance to intermediate term goals or challenges, with lower level employees encouraged to invent how these goals will be achieved”(Hamel & Prahalad 1989 p19).

Examination of the Ghoshal & Bartlett model reveals that the task of top management is to create an environment that enables people to co-operate and one of the means to do this is the growth of vertical and horizontal networks.

In the classical approach to strategic management this stage would be perceived as the conventional planning stage, however the difference rests in the process whereby targets and means are interlinked and reconciled across the organisation. Later Hoshin Kanri literature stressed the importance of participation and this is reflected in the management models as discussed in the previous chapter and noted above. Related to

this area is the development of work which examines the effects upon strategy implementation of middle management inclusion within the strategic management process (Floyd & Wooldridge 1992, Guth & McMillan 1986, Westley 1990), and the nature of employee involvement and empowerment (Wilkinson 1998).

The means through which participation occurs in practice is unclear. Akao (1991) stresses the process of co-ordination and touches upon the concept of catchball as one such means, however, there is little development of knowledge of this practice within a Western context in the subsequent Hoshin Kanri literature. The new models of management as proposed by Ghoshal & Bartlett and Hamel & Prahalad, while recognising the need to develop participative forms of management, do not suggest how this may be operationalised within an organisational context.

INTEGRATION

The strategic management literature has been dominated for many years by issues which relate to strategic choice. Focus has rested upon tools and techniques which improve the strategic decision-making process. Debate has centred around issues of strategy formulation. There is a dearth of literature regarding strategy implementation yet the difficulty organisations have implementing strategic decisions at an operational level is well recognised.

According to the Hoshin Kanri literature, the Hoshin Kanri process in its entirety should assist organisations in closing what the strategy literature describes as the formulation/implementation gap. The importance of connecting strategy with

operations, was noted by Reid (1989), and Pettigrew & Whipp (1993). It is the integration phase of Hoshin Kanri which in practice facilitates the connection of strategic with operational concerns. It is at this stage of the process that implementation occurs; in fact there is little in Akao's work, as recognised in the discussion in Chapter Two, to inform the reader how this may occur. The Hoshin Kanri literature published in the West generally misses the integration phase of the process. For example Bechtell (1995) recognises the focus, alignment and review phases of the process, yet does not recognise the integration phase of Hoshin Kanri.

How far the integration phase may rely on pre-ceding (Do) and following (Check) stages is open to question. As has already been noted in the previous chapter the differences which exist between a Japanese understanding of the purpose of corporate planning as providing a broad context for actions, and the Western understanding, as a formal programming mechanism, affect approaches to strategy formulation and implementation. The concentration of activity in the PLAN stage of the cycle, suggests DO will naturally follow. Additionally, the style of Akao's text makes it difficult to distinguish between the focus for Steps 9 and 10 within the process as proposed. As with the concept of catchball there is an assumption that the reader will naturally understand the importance of Step 9 "Check the results of implementation", to the implementation process. It is this step which should ensure the integration of strategic and operational concerns, as a continuous process of review of activities is ensured by the application of the PDCA cycle at each level of activity.

While recognising the importance of the process of integrating strategic and operational concerns, and the critical nature of the role of the integration phase of Hoshin Kanri in achieving this, there is little in the Western Hoshin Kanri literature to indicate how this may be carried through in practice in a Western context.

Similarly in the strategic management literature the models of management discussed above, while moving away from the classical approach of planning detailed programmes for strategy implementation, do not indicate structures or ways of working which would provide guidance for organisational actors attempting to manage strategy within the context of a broadly stated organisational purpose. Hamel and Prahalad discuss the strategic architecture required to support the development of core competences, with no indications for organisations of what this means in practice. Ghoshal & Bartlett recognise the importance of systems policies and procedures which will support a focus upon people, and the importance of self monitoring, but what this means in real terms is left unexplained.

REVIEW

The review phase of Hoshin Kanri is a learning based response to experience, as the application of the Hoshin Kanri process itself is reviewed on an annual basis; this is Step 9 and 10 of Akao's Steps for Hoshin Kanri implementation. This is given prominence by Akao as the means through which the effectiveness of the process is measured, which is then used by top management to signal to the rest of the organisation the importance of the process, and their contribution to it. The 'check' that Akao outlines is called the 'Presidential Diagnosis' which involves high level direct

participation. Throughout this process, information regarding performance and organisational processes is rolled up through the organisation, ultimately acting as part of the data that is required to enable strategic priorities to be established in the next period.

The strategic management literature generally fails to acknowledge the importance of review in the management of strategy. It is within the context of the TQM literature that a similar Western practice is discussed through the application of self-assessment models such as the European Foundation for Quality Management Award (EFQM), or in the case of large organisations the application of their own bespoke self assessment models (for example Philips)

Summary

Proposing a conceptual model for Hoshin Kanri has allowed the synthesis of the literature discussed in the previous two chapters in order to establish how far the current debate in the field of strategic management informs knowledge of Hoshin Kanri and vice versa. The two models of management examined suggest a correspondence with the Hoshin Kanri process. The over-riding question which remains unanswered however, is how these management models are operationalised in practice, and what organisational issues arise as a result of their development.

The research will use the FAIR categorisations to explore and identify organisational practice and associated issues throughout each of the stages. The main issue to be addressed is to discover how, in practical terms, knowledge of Hoshin Kanri will bridge

the recognised gap in the strategic management literature regarding the way in which strategy is managed within the organisation.

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CHAPTER FIVE: RESEARCH METHODOLOGY

Introduction

The research which forms the base for this thesis is a single case study design chosen because of the nature of the process under investigation. The organisation involved in the research was selected because it was likely to provide an exemplar of practice. Within the case study a tracer approach was utilised to identify individuals who were likely to have special knowledge of the process; this involved carrying out over sixty interviews within the company over a period of two year. This chapter seeks to outline the research methodology that was employed throughout the course of the research, and by drawing upon the relevant literature explain why this approach was felt to be the most suitable way of addressing the research aims.

Research approach

A literature review was undertaken primarily in the areas of Hoshin Kanri and Strategic Management in order to ascertain the current state of knowledge in both areas, and to construct a conceptual model which could be used to guide the research and identify relevant research issues.

A qualitative research design

An examination of the literature suggested that Hoshin Kanri manifests itself as the way organisations with a total quality management operating philosophy manage the strategic process. The dearth of available research, and the prescriptive nature of the

existing literature, determined the exploratory nature of the research design. The conceptual model derived from the literature identified a number of research questions to be addressed, which suggested that a qualitative approach would be an appropriate way through which an understanding of Hoshin Kanri could be gained within the context of the organisation.

In determining an appropriate research approach the crucial question is the extent to which one method contributes to a greater understanding than any alternative method would have done within a given level of resources. In terms of conventional organisational analysis Hoshin Kanri required a different approach for study, conventionally it would be studied as an object, and a reductionist approach would be used. However, the literature suggests that Hoshin Kanri presents a way of managing change that is more to do with 'organising' than 'organisation', and thus required an approach that had to be holistic. Because of the lack of research-based knowledge of Hoshin Kanri, and the apparent complexity of the process, it was evident that the research would be exploratory and inductive. Research of this nature can be found in the studies of Mintzberg, a key writer in the field of strategic management (Mintzberg 1978, 1979).

Archer reports that it is becoming common to see calls for qualitative research in disciplines concerned with management (Archer, 1988).

The objective of qualitative research is to:

"describe, decode, translate or otherwise come to terms with the meaning, not the frequency, of certain, more or less naturally occurring phenomena in the social world."

(Van Maanen 1979 p520)

The insight that could be gained from a qualitative study is, in this instance, analogous to that reported by Bryman (1989) in the study of corporate culture in InsCo by Smircich (1983), which involved following through the implementation of an initiative to deal with a backlog of claims:

"Without the detailed knowledge of the varied interpretations of life in InsCo and the background context, the programme could easily have been interpreted by an outsider as a success." (Bryman 1989 p137)

It was only through the adoption of a qualitative research design that questions were raised as to the correctness of this interpretation.

The model for Hoshin Kanri derived from the literature clearly suggests a process which unfolds over time, and which requires individual involvement across the organisation. The complexity of the process, and the importance of the temporal nature of its progression, suggest that to gain an insight into the way events are interlinked, and strategy is managed and developed over time, requires adoption of a qualitative approach. This approach is supported by Pettigrew, who argues that in the field of strategic management, a contextualist approach should be adopted:

"..understand the emergent situation and holistic features of an organisation or a process in its context, rather than divide the world into limited sets of dependent and independent variables isolated from their context." (Pettigrew 1985 p 22)

By using a qualitative approach one can pay detailed attention to micro-level aspects that are barely accessible to quantitative approaches (Archer 1988). Emphasis within a qualitative research design rests upon the priority accorded to the perspectives of those being studied and the interpretation of observations in accordance with the subject's own understanding (Bryman 1989).

Case study

A case study design was considered to be the approach which would be most fitting to the exploration of Hoshin Kanri; a complex process that had hitherto remained largely unexplored:

"..the distinctive need for case studies arises out of the desire to understand complex social phenomena...the case study allows an investigation to retain the holistic and meaningful characteristics of real life events." (Yin 1994 p3)

This view is reinforced by Valdelin:

"The detailed observations entailed in the case study method enable us to study many different aspects, examine them in relation to each other, view the process within its total environment and also utilise the researcher's capacity for 'Verstehen' Consequently, case study research provides us with a greater opportunity than other available methods to obtain a holistic view of a specific research project."

(Valdelin 1974, cited in Gummesson 1991 p76)

An important advantage of case study research is the emphasis on context, which provides a frame of reference for interpretation, this combined with the depth of involvement over time allows links to be made and organisational processes to be inferred (Bryman 1989).

The lack of identified research led to the adoption of a single in-depth case study approach to gain a holistic view of Hoshin Kanri. Consideration had to be given to the practical issues of the small number of identified organisations using Hoshin Kanri, the problem of access and the available resources to carry out the research.

“In this context, case research seeks to obtain a holistic view of a specific phenomenon or series of events. This is a time consuming job and it is generally not possible to carry out more than one or a very limited number of in depth studies in a research project.” (ibid p76)

Glaser & Strauss recognise the value of a single case study in laying the foundation for future work:

“Since accurate evidence is not so crucial for generating theory, the kind of evidence, as well as the number of cases, is also not so crucial. A single case can indicate a general conceptual category or property; a few more cases can confirm the indication.”

(Glaser & Strauss 1967 p30)

As the subsidiary of a larger Japanese organisation, the company that agreed to participate in the research was likely to have a more developed Hoshin Kanri process, and as such would provide a richer and more informed understanding of the process. As such the case was likely to be of particular interest. The use of a single case study approach in the field of strategic management is not without precedent as Mintzberg argues:

“What, for example is wrong with samples of one?” In discussing the grounds for his own research he argues that management research has *“paid dearly for the obsession*

with rigor in the choice of methodology. Too many of the results have been significant only in the statistical sense of the word." (Mintzberg 1979 p583)

The need for this research approach is supported by Michael Porter, another influential academic in this field:

"Academic journals have traditionally not accepted or encouraged the deep examination of case studies, but the nature of strategy requires it. The greater use of case studies in both books and articles will be necessary for real progress at this stage in the field's development." (Porter 1991 p99)

The argument for supporting a single case study approach to the research of Hoshin Kanri is further reinforced by Burgelman who argues that:

"Living with these concerns (about the external validity of findings) may be a necessary cost of providing new insight in as yet incompletely documented management processes in complex organisations. The purpose of such efforts is primarily to generate new insights that are useful for building theory." (Burgelman 1985 p42)

Yin suggests three reasons for a single case study, one of which, the revelatory case, applies to this study of Hoshin Kanri:

"This situation exists when an investigator has an opportunity to observe and analyse a phenomenon previously inaccessible to scientific investigation." (Yin 1994 p40)

The approach adopted overcame the acknowledged problem in organisational research of taking account of the temporal processes in organisations; the issue of temporal validity:

"In particular when research is based on a detailed case study, there are often clear benefits associated with either an extended stay or a return to the organisation in question. One of the strengths of qualitative research which is based on detailed case studies is that it is able to capture processes over time, ..brief periods of qualitative research may fail to capture some important phases in the organisational life cycle."
(Bryman 1989 p243)

There are a number of criticisms levelled against this approach. Bryman reports that case studies have been labelled as idiosyncratic as evidence derives from one or two untypical organisations (Bryman 1989).

Implicit in much research is that generalisation is a desirable outcome, Gummesson however argues that in case study research:

"Generalising from statistical samples is just one type of generalisation, however - it is not general - and it is rarely applicable to case study research. Generalisation from case studies has to be approached differently." (Gummesson 1991 p78)

This view is supported by Normann who argues that:

"...the possibilities to generalise from one single case are founded in the comprehensiveness of the measurements which makes it possible to reach a fundamental understanding of the structure, process and driving forces rather than a superficial establishment of correlation or cause-effect relationships." (Normann 1970 p53)

Generalisation has two dimensions, that which arises from quantitative studies based upon a large number of observations in order to determine 'how' questions.....how much

how often and how many. On the other hand there is that meaning of generalisation which would involve the use of in depth case studies, based upon exhaustive investigations and analysis to identify certain phenomena, for example the effects of a change in corporate strategy. Such an investigation may:

“lay bare mechanisms that one suspects will also exist in other companies.”

(Gummesson 1991 p79)

Case studies should be evaluated in terms of the adequacy of the theoretical inferences that are generated (Yin1994, Mitchell 1983).

“The aim is not to infer the findings from a sample to a population, but to engender patterns and linkages of theoretical importance.” (Bryman 1989 p173)

Case studies have a role to play which does not necessarily involve the need for generalisation in providing an understanding of organisational ways of working and processes that are not well documented and which are not amenable to investigation through quantitative methods of investigation. As with Burgelman’s study there may exist a concern to build theoretical insights. Bryman reports the exploratory case study approach utilised by Powell (1985) to achieve insights into a previously uncharted area which led to subsequent generation of theory (Bryman 1989).

Tracer Method

Given the complex nature of the Hoshin Kanri process a Tracer approach was adopted as a means through which the process could be most usefully explored over time. Precedent for the use of this method can be found in the works of Woodward (1966), and later in its application in the field of Information Technology as used by Symon & Clegg (1991).

"The tracer approach implies a very detailed study of part of a firm's activities over a period of time." (Woodward 1966 pxi)

The earliest use of Tracer studies identified was a within a research project based at Imperial College London the aim of which was to explore the links between organisational behaviour and technology (1966). The researchers were faced with the problem of trying to understand a complex process within an organisational context. There is much in common between the study as carried out by Woodward and the piece of research which is the focus of this thesis. The purpose of the study was not to propose and test a hypothesis, but to clarify and order a largely unknown situation guided by a conceptual framework established through previous research. In order to uncover and develop knowledge of the process at work in the context of the manufacturing unit the researchers adopted an approach which 'led them' naturally through the process.

"A number of case studies were made in which attention focused on the setting of objectives in relation to the manufacturing task and on the consequent planning, execution, and control stages of the cycle. This was done by using the tracer method, that is, studying the control system of a manufacturing firm by isolating a particular task or order and observing the way in which people become involved with it and decisions are made in relation to it during its progress through the firm concerned."
(Woodward 1966 pxii)

The research notes that while the criteria for selection of the research organisations was that they be identified according to the technology utilised:

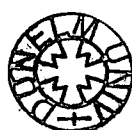
"..the only criteria on which the choice was based were willingness to co-operate and the fact that the 'tracer' could be isolated." (ibid pxiii)

The expected outcome of the research was not to produce general conclusions or theoretical conclusions about the issues under study (lack of knowledge of the area did not allow the proposition of any firm hypothesis), but to stimulate debate about organisational theory in such a way that the research was identifying new issues and problems therefore raising new research questions and redefining old ones.

There is a strong correspondence between the research studies undertaken by Woodward and that of Hoshin Kanri. Literature in this area is dominated by the normative models proposed by consultants and practitioners. There is no identified research and therefore a lack of critical studies of Hoshin Kanri within an organisational setting. There is a need to order and clarify the critical issues surrounding its implementation. As Hoshin Kanri is a complex process which involves a number of organisational actors at the same time, the adoption of this approach allows a comparison of perspective of organisational actors at all levels of the organisation, uncovering the differences in understanding of Hoshin Kanri, its impact on ways of working, and the problems and issues which arise as a result of its implementation.

The tracer provided a means through which the exploration of organisational activity could be ordered, and a reference for the collection of relevant data. Following the tracer through the organisation as events unfolded enables the process of Hoshin Kanri to be followed in a real time context. This overcomes the problems associated with other methods of research where, retrospectively, selective memory may distort findings.

Later work by Hornby & Symon defines Tracer studies:



"Tracer studies are a method of identifying and describing organisational processes (such as decision making and communication) across time and stakeholder groups by the use of tag(s) (such as documents or meetings)." (Hornby & Symon 1994 p167)

The tracer study provides a framework to enable the identification of the sample from which the data should be collected. The tag is used as a means of following the unfolding process through the organisation, prompting discussion of the process with organisational members and identifying further important sources of information.

Hornby & Symon cite an example of such a study. Symon & Clegg (1991) used the method as part of a wider case study which concerned the evaluation of a computer based system integrating the organisational departments of design and manufacturing. Key participants interviewed in the course of the research were identified through the placing of tags on products. The interviews allowed the researchers to examine more deeply the reasons why certain systems within the process were not being utilised. Tags are used as a data source and as a means of sampling key participants in a process. In following the tracer study through the organisation unstructured interviews are used as a means through which:

"perceptions, motives and different levels of influence of the various participants in the process under investigation.... the data will describe patterns in the broadest sense rather than in terms of causal relationships." (Hornby & Symon 1994 p168)

Tracer studies are a form of non probability sampling, the purpose of which is not to establish a random or representative sample, but to identify those people who have information about the process. It is a means of identifying relevant people, documents and sub-processes (ibid p169).

In drawing a distinction between the two forms of sampling Johnson suggests:

“Probability sampling yields the researcher a representative picture of various features of the population; non probability samples yield a small number of informants who provide representative pictures of aspects of information or knowledge distributed within the population.” (Johnson 1990 p23)

Further research has developed the use of the tracer method in the IT and hospital context (for example see Symon, Long & Ellis 1996).

Adopting the tracer method in exploration of Hoshin Kanri provides a framework which allows a flexible research approach to working within an organisational context with a dynamic process of which there is little knowledge and which requires the ability to respond to changes in direction.

Process of investigation

A company using Hoshin Kanri to manage was identified, and following preliminary enquiries with senior management agreed to co-operate in the research. This company was of particular interest because of its close Japanese associations and the length of time it had been managing using Hoshin Kanri it was likely to provide an exemplar of practice. Preliminary interviews were held with senior management to outline the policy making process. Background information relating to the organisation was collected, company documentation relating to the policy process was examined, and accounts of previous experience gathered. The research extended over a two year period.

Senior management identified possible areas for exploration based upon current policy. Co-operation from objective owners was sought and obtained. Two objectives were identified as suitable for tracing. The objectives were decided upon for a number of reasons, the most important of which was the nature of the objective and the scope of the activity this suggested. The first objective impacted directly upon operations, while the second objective was longer term, and the impact of activities which would translate from it and the way in which these would flow through the organisation was less clear.

Tracing the impact of the objective upon organisational action involved identifying respondents throughout the course of the research as activities towards objective achievement unfolded. Documentary evidence such as minutes and planning documents identified potential respondents. Key meetings were identified and as far as possible all of those involved were interviewed following the meeting.

Documentation

Documentation was collected throughout the course of the research. Company brochures and newsletters provided valuable information from which historical company information could be obtained. They proved to be a useful indicator as to the way in which the company communicated with customers and employees, and the quality and depth of the information provided. As far as possible top-level policy planning documentation for each year detailing the translation of activities was collected. Documentation relating to the progress of meetings managing the specific objectives traced such as agendas, minutes and memos was collected to facilitate the

tracing of activities, inform the process and substantiate data which was being collected through the interview process:

"For case studies, the most important use of documents is to corroborate and augment evidence from other sources." (Yin 1994 p80)

Additionally, documentation which related to those activities which translated from the objectives traced, and which reviewed progress of the activities, was collected. These were useful not only in informing the research process, but also indicated the sort of documentation which the company had developed to support the Hoshin Kanri process.

Interviews

The qualitative research interview: *"is an interview whose purpose is to gather descriptions of the life world of the interviewee with respect to interpretation of the meaning of the described phenomena."* (Kvale 1983 p174)

Over the period of the research, which spanned two years, almost sixty semi-structured interviews were carried out at all organisational levels. The majority of the respondents were interviewed more than once as issues arising from previous interviews required expansion, clarification or development. Several of the respondents were interviewed on a regular basis throughout the period of the research.

The interviews were loosely structured, questions were open and were generally informed by the conceptual model as developed in Chapter Four. Interviews were taped, transcribed and then the transcriptions were fed back to the respondents to ensure an accurate recording of events. Using this approach to ensure that the views of events

corresponded to those held by the respondents provided a form of validation. This form of validation was carried out in the case of Buchanan, Boddy & McCalman (1988) when interview transcripts were fed back to respondents to check for factual and interpretive validity. It could be argued that such an approach invites censorship. However, while free to request amendments to interview transcripts, the respondents are not involved in the subsequent process of analysis through which the researcher draws inferences from the transcripts. The fact that multiple respondents were used allowed the opportunity to check interpretations from a variety of different stances.

The organisational actors

The actors involved in the research came from all organisational levels within the company (See Appendix 1 for more details). They included all of the senior management team with the exception of the Japanese members. All of those involved had a significant role to play in enabling a picture to be formed of the Hoshin Kanri process within the company, which drew on a range of differing organisational perspectives. As previously discussed the research method adopted was central to the selection of the interview sample. The Engineering General Manager championed the research and was the gatekeeper into the organisation. He was instrumental in facilitating access to documentation, respondents and providing updates upon progress of events on a regular basis. Access was provided to working areas within the factory to demonstrate changes that were being made in real time.

The majority of the participants had been in employment with the company since its start up. Several, including the Engineering General Manager and the Engineering Manager had been employed prior to the plant construction and were involved in

overseeing the building and commissioning of the plant. While the Engineering General Manager and the Engineering Manager began life in the company in that capacity, the production General Manager was initially employed as a supervisor in the material handling department, and through a series of promotions was appointed as a General Manager in 1996.

Analysis

One of the difficulties in utilising a qualitative research design is the quantity of data generated, and the handling of this data in a consistent manner. The exploratory nature of the research determined the way in which the analysis developed as an iterative inductive process, the aim of which was to develop understanding of the Hoshin Kanri process within the context of the organisation

Analysis consists of three concurrent flows of activity: data reduction, data display and conclusion drawing (Miles & Huberman 1994). The process of analysis began prior to the data collection with the development of the conceptual model as presented in Chapter 4. The conceptual model provided a tentative framework through which the interview data could be organised, whilst the adoption of the tracer method of research acted as a form of sampling for the collection of relevant data.

Throughout the continuous process of analysis data was being organised at several different levels, and this is reflected in the way in which the studies are presented later in the thesis. At the beginning of the field research there was a process of data collection and analysis that focused upon general information about the organisation. This allowed the development of an understanding of the way in which the organisation

operated, and the context within which it did this, including the relationships it had in the wider environment which were potentially influential in terms of the Hoshin Kanri process. The final outcome of this process is presented in Chapter 6, and this provides a backdrop for development of an understanding of the Hoshin Kanri process. This required documentary analysis of in-house publications which entailed a process of clarification and summarising, noting the significant issues for the organisation, and analysis of relevant data from interview transcripts.

The next stage of analysis focused upon a need to develop understanding of Hoshin Kanri within the organisation; the results of this analysis are presented in Chapters 7,8 and 9. As has already been noted the process of analysis began prior to the field research with the development of the conceptual model and the research design. The focus upon the progress of two objectives provided a way of ordering the iterative collection and analysis of the relevant data by subdividing and reducing the data. The analysis was further assisted by the interviewing and transcribing process.

The advantage of recording interviews and then transcribing the tapes as part of the research activity, was that it involved a process of close, repeated listenings to recordings which often revealed previously un-noted features, and which itself formed part of the analytic process as it developed an in-depth knowledge of the data. This transcription, which occurred as soon as possible after the interview, allowed the development of a perspective that combined immediacy with a reflective overview of what went on in the contact. This was captured using annotations throughout the transcription which were a reflection upon the main concepts, themes, issues and questions which arose as a result of the contact.

The iterative nature of the process and the adoption of the tracer approach necessitated continuous analysis at this stage to enable the identification of the relevant individuals to contact and interview throughout the flow of the research. This meant that there was a constant movement back and forth between the process of thinking about the existing data and the collection of new data.

The iterative nature of the analytical process uncovered bias and surfaced areas for clarification, one example of this which is reported in Chapter 6, was the potential impact upon the research process of the organisational restructure affecting the Production Engineering Department. Because recordings of interviews were transcribed almost immediately, the impact upon the perspectives of those involved was recognised, and follow up interviews were arranged at a later date. At the same time there was recognition of the potential impact of the re-organisation upon the Hoshin Kanri process itself. The analysis required a constant: *"feeling of the way to a set of relationships that accounted for important pieces of what was seen and heard."* (Miles & Huberman 1994 p62) The constant process of analysis and rereading of transcripts allowed a deeper analysis as the research progressed and knowledge developed about local dynamics allowing a shift from descriptive analysis to a more inferential and explanatory analysis (Miles & Huberman 1994). Analysis also sought to develop understanding of the process as a sequence of events from the perspective of the organisational actors involved as they occurred in real time. One examples of the outcome of this analysis can be seen in figure 8.2 in Chapter 8.

During the process of data analysis and collection what was sought was evidence of the way in which the Hoshin Kanri process worked and the issues associated with its

operation. The utilisation of the tracer approach meant that the identification of relevant informants was a dynamic process, and transcripts were analysed to inform knowledge of the process from the perspectives of actors at different organisational levels, or those with experience at different stages of the process itself. What was of interest was the uncovering of the way the process worked from the perspective of those organisational actors; that is, what they did and how they did it. Each organisational actor might have referred to one or more of the four stages of the process as outlined in the model, and while there was no formal structure to the interview process, during the interview informants were asked to provide examples of how the stage of the process referred to by them, operated at their level of involvement.

The dynamic research approach facilitated a constant process of verification, as throughout the research common themes and anomalies became apparent, and surprises that resulted from this were followed up through further interviewing and analysis as differing perspectives emerged. What is presented in this thesis is a representative view of the Hoshin Kanri process which reflects the experience of those organisational actors involved. This is evidenced by the use of quotations throughout; where there was any significant difference in understanding of the way in which the process operated this was verified or discounted through a constant interaction with, and development of, in-depth knowledge of the transcripts as the tracer approach unfolded.

The process was assisted by continuous writing up, which was itself part of the analytic process, and resulted in the production of interim studies and reports. This led to a reformulation and clarification process as transcripts were revisited in the light of developments, and as the significance of various information became clearer. As part

of this writing process a number of figures and matrices were constructed which were both a development of the analytic process and an outcome of it. They assisted in the reduction and sense making of the relevant data, and provided a means to present themes and relationships in a 'user friendly' way. The final versions of some of the figures and matrices are presented as part of the studies in Chapters 7, 8 and 9.

Throughout the process of writing and analysis themes began to emerge and tentative conclusions were drawn which were continuously challenged as the research process progressed, until the final conclusions from this study which are presented in Chapters 10, 11 and 12 of this work were arrived at. The analytic process occurred at three levels. The first level was that at which the data itself was summarised. The second level was that at which an understanding and knowledge of the data was developed so that themes and gaps were identified and clarified, and the third was that at which the data was synthesised and major themes were explicated to produce conclusions. Given the exploratory nature of the research an inductive iterative analytical approach guided by a tentative conceptual framework proved to be a fitting approach to adopt to make sense of the rich body of data that resulted from the field research.

Summary

The review of the literature suggested that the nature of the Hoshin Kanri process was such that it required a qualitative research approach. The lack of research based knowledge and the apparent complexity of the process required an exploratory and inductive approach. A single in-depth case study design was decided upon as it would provide valuable insights into the Hoshin Kanri process over time within an organisational context.

The selection of NYEL as the focus of the investigation was based upon its potential in providing an exemplar of practice because of the likely transfer of learning which would have resulted from its Japanese antecedents and its status as a first tier supplier to a Japanese owned producer in the automotive industry. As an exemplar of practice this study was likely to provide a richer and more informed understanding of the process, and as such was of particular interest.

The tracer method utilised within this builds upon limited knowledge of this approach which has a history which goes back to the 1970s. Using documentation and a series of over sixty semi structured interviews over a two-year research period, data was collected to support the aims of the research. Analysis was carried out using the conceptual model for Hoshin Kanri proposed in Chapter Four, the results of this analysis will be presented in Chapter Ten, and later in the thesis a reflexive account of the impact of this research approach upon the research itself, and the limitations of the research will be discussed.

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CHAPTER SIX:
NISSAN YAMATO ENGINEERING LTD. (NYEL)
BACKGROUND

Introduction

The aim of this chapter is to provide a context for the research study which follows. A brief overview of NYEL's history and ownership will be given followed by an outline of practices, relationships and events which are considered pertinent to developing an understanding of the Hoshin Kanri process.

Background

Nissan Yamato Engineering Ltd (NYEL), was one of a number of companies established in the North East of England in 1987 as part of the growth in overseas investment by Japan. According to the Japanese External Trade Organisation (JETRO), in 1976 there were 34 Japanese manufacturing companies operating in Europe. By 1986 this had increased to 131 companies, and in 1996 this figure had more than doubled to 438; the majority of which were situated in the UK. In the North East of England there were four automotive part manufacturers in 1986, by 1996 this had risen to 29 (JETRO 1996). The primary rationale for the foundation of the company was to support the development of the manufacture of cars, following the establishment of Nissan Motors (NMUK) in Sunderland Tyne & Wear.

Ownership

At the beginning of the research NYEL's Japanese parent company was Yamato Kogyo, a family concern with expertise in provision of pressed steel parts for the automotive industry in Japan which had been trading since 1936. NMUK was not only NYEL's major customer, but was also the majority shareholder with a 51% share holding, while Yamato held 49% of shares. NYEL was Yamato Kogyo's only interest in a unit operating outside of Japan. Ownership of the company changed towards the end of the research period when Yamato Kogyo merged with another Japanese organisation Yamakawa, and the UK operation changed its name to UNIPRES. NMUK reduced its equity in the company to 30% with Yamakawa taking a 70% share. At this time units in Spain and Mexico were incorporated into a larger organisation.

Production process

The production process involved a batch production system operating according to Just in Time (JIT) principles utilising cellular manufacturing techniques. This entailed two main production processes as steel coils were pressed into parts, followed in some cases by an assembly process, which involved one of a number of welding procedures. Operation according to JIT principles meant that despatch was a key organisational process. On average in 1997 on a basis of synchronous delivery direct to line side, NYEL delivered two million units per month directly from the pressing operation, and 5.2 million units per month directly from the assembly operation to NMUK. This supply comprised of 313 parts for the Primera car and 247 parts for the Micra car.

Customer base and sales

At the time of the research the company was producing for Ikeda Hoover Ltd, Hashimoto Ltd, Rover Group Ltd and Isuzu Bedford Corporation Vehicles Ltd, but this accounted for only a small percentage of NYEL's overall production, and NMUK remained NYEL's major customer.

Sales for NYEL in 1997 were £66.7 million, up from £59.3 million in 1996, this reflected the increased demand the organisation was meeting as a result of NMUK's success in Europe. As a result of higher than expected sales, NYEL was able to achieve the long term objective set at its foundation in 1987, to eliminate the losses which had been incurred following initial investment in the company. The organisation moved into profit for the first time in this year. The tendency of Japanese firms to have a longer term view in terms of expectations of profitability is confirmed by Wong et al (1988) in a study of thirty Japanese firms selling in the UK:

"..the Japanese approach reflects a managerial philosophy more oriented to long term market position than short term profit performance." (Wong et al 1988 p107)

NYEL began full production in October 1989 of the Primera, this was later followed by the Micra car which was produced within the existing capacity. The cars produced were subject to design changes on a continuous basis which were 'facelifts' of existing cars, and which were talked of in organisational terms as 'new models.' For the first time in 1996 the company had to plan to manage a model change within existing space as the facelift for the Primera was introduced and the free capacity was not available to install new plant to cope with the necessary production changes. The space saving project

which ensued as a result of this was the precursor to the reconfiguration project discussed in Chapter Nine.

Throughout the time of the research NYEL was challenged by increasing production volumes as demand was higher than forecast. Sales of NMUK's cars in Europe hit a five-year high in 1997, and this had production implications for NYEL as the number of parts demanded increased. Further in 1997 NYEL had to respond to a decision by NMUK to bring production of the first Nissan estate car produced in the UK, the Primera Estate, forward by three months. The new car was made available from May 1998 to meet a perceived increase in demand in the market place. The deputy MD of NMUK was reported to have acknowledged both the market trend and the organisation's ability to deal with this:

"Once again we have proved the value of manufacturing flexibility by reacting quickly to changing market conditions. We have been able to bring the right car to market at precisely the right time."

(Nissan Online Issue 24 March 1998 p2)

NMUK's ability to respond to identified changes in market demand depended upon the ability of their suppliers to respond accordingly. To support the launch of the car, NYEL had to bring forward production of the necessary parts by three months to December 1997. Additionally in 1997 NYEL embarked upon export business to the USA, South Africa and Japan. The significance of these events are noted, as the way in which the unplanned changes, either to production demand or scheduling, have a

potential to impact upon the way in which NYEL manage strategy will be considered in the studies that follow.

Mid 1997 NMUK informed its suppliers that a third car, the new Almera, would be produced in the UK at its Sunderland operation, and was to be launched in the year 2000. For NYEL this was against the backdrop of increasing demand, when production output was at an all time high. As a result of this decision building expansion was undertaken with investment in new plant and the purchase of new presses. The plant extension for the new car cost more than £12million, the capital came from money generated in the business. The building work required to accommodate the new model was completed in July 1999. The activities which flow from this decision, provide the focus for one of the studies presented in Chapter Nine of this thesis.

As was common practice in the Japanese automotive industry, as a first tier supplier, NYEL was subject to an annual supplier assessment, alongside 200 other suppliers within the supplier group; management of the supply chain was of major concern to NMUK. NYEL were assessed according to measurements categorised as Quality(Q), Cost(C), Delivery(D), Development(D) and Management(M). QCD can be seen to correspond to the QCD categories as outlined in Chapter Two, and which related to the expectations that NYEL had of NMUK in terms of product quality, cost and delivery; specific targets are established for the organisation against each of these. The development (D) category encompassed all of those activities which related to technological development, for example, in materials used or new product design. The management (M) category related to the way in which NYEL developed management

processes, for example, the management of strategy within the organisation. Later discussion will highlight the significance of these categorisations for NYEL's strategy.

NMUK recognised supplier achievement through an annual award scheme, and recognition in this way was considered prestigious, as it was perceived to signal excellence within the group and to the automotive industry generally. In the period 1993 to 1996 NYEL's mid-term strategy was focused upon a drive to win such an award. 'Best in Group' (BG'96) was a challenge to become NMUK's best supplier within the supplier group as judged on 1996 results, and as measured according to the QCDDM categorisation as outlined above. While NYEL did not receive that award, in March 1998 NYEL was recognised for its achievements when the company won the 'Most Improved Supplier Award' for 1997. NMUK recognised the improvement in quality as measured in parts per million (PPM) defects with a reduction from 1500 PPM in 1992 to 36 PPM in 1997. NYEL had improved some 80 places in the supplier ratings as assessed by NMUK, and according to the General Manager a contributory factor to the achievement of this award was perceived to be Hoshin Kanri.

The management of people

At its foundation Yamato Kogyo seconded a large contingent of Japanese personnel to work in NYEL from the parent company. These numbers reduced over time as expertise developed; the company retained a Japanese MD and a Commercial General Manager. Several technical advisors were seconded from the Japanese plant. Their role was to communicate learning from the parent company regarding best practice relating to technical issues. The practice of Japanese parent companies retaining a Japanese MD

when establishing operations abroad was reported as common practice in America, particularly in the automotive sector (Kenney & Florida 1995). The reasons for this relate to a familiarity with the production process, and to facilitate communication between the operation abroad and the Japanese plants.

It was practice for personnel from the UK to spend time visiting the Japanese plant as the situation demanded. The number of advisors increased substantially towards the end of 1997, and by the beginning of 1998 fifteen Japanese workers had joined the UK organisation. This increase in Japanese personnel supported the change in time scale for production of the Primera Estate, as incomplete cells were shipped from Japan and Japanese engineers were required on site to commission them.

Initial recruitment to the company on its foundation was through an agency and adhered to strict criteria. A flexible attitude and ability to change were prerequisites for selection; this in a geographical area which was heavily unionised, and where the traditional industries were mining and shipbuilding with no experience of the automotive industry. The highly selective recruitment follows practice evidenced in other Japanese plants establishing in the UK (for example see Pang & Oliver 1988, and White & Trevor 1983, Wilkinson & Ackers 1995), and combined with the choice of a greenfield site allowed the introduction of different ways of working (Wilkinson et al 1995).

From the beginning management of personnel was predicated on equality, with everyone given the same terms and conditions of employment. Everybody wore a

uniform, there was a shared canteen facility, private health insurance and there was a non-union agreement. Negotiations regarding pay and terms and conditions of employment were carried out within the framework of a Review Council which had worker representation within its membership. These practices were common with other Japanese plants in the West (for example see Wilkinson et al 1995, Wilkinson & Ackers 1995). There was an internal labour market and promotion from within was standard practice. There was a recognised staff development path from manufacturing through to engineering or administration management achieved through a process of training.

In April 1997 the company employed almost 500 permanent staff, which increased slightly through 1998. Short-term requirements for manpower to meet fluctuating demand conditions tended to be met by the recruitment of temporary workers. The reliance upon temporary staff was, according to the Engineering General Manager, because of a reluctance by senior management to make people redundant should demand conditions decline; this had happened previously in the company's history and had affected employee morale. The term 'temporary' was used loosely as some staff employed on this basis had been with the organisation over twelve months. When permanent vacancies arose these were usually filled by temporary staff who were judged to have performed well.

Towards the end of the research temporary staff numbered almost 300 to meet demand conditions; many of the temporary staff were employed as a result of a change in shift patterns. At the beginning of the research period a two-shift system was in operation in the production operation, towards the end of the research, to meet increased demand

conditions, a three-shift system was introduced. Recruitment of staff was carried out through an agency, and there were some problems in recruiting staff with the necessary skills. The sheer volume of numbers had implications across the company as the increased personnel had to be accommodated within the same workspace, and impacted upon existing staff in areas such as training. A period of training and induction was required before involvement in the production process was allowed, and there were implications for QCD indicators as individuals required time to familiarise themselves with the production process. While the Production General Manager reported no significant impact upon these indicators, this was contradicted by the Engineering General Manager.

Training within the company comprised two elements, that which was company-wide and in which all employees participated was related to issues such as the use of quality tools, housekeeping, health and safety and associated issues, and that identified as a result of specific individual needs through the appraisal system. The company had previously financed external qualifications such as MBAs, but in an effort to reduce costs had ceased to do this, questioning the value of such broad qualifications to the company.

In order to combat rising levels of absenteeism and sickness the company had introduced what were perceived by some as a stringent set of practices relating to lateness and absence from work. Company practices such as financing family days out to local events, the giving of a bottle of wine, and toys for employees' children at Christmas had also ceased as a result of a drive toward cutting costs. These changes in

practice suggest support for a hypothesis proposed by Wilkinson & Ackers (1995) in a study which examines the development of Human Resource practices in Japanese owned companies in the UK:

“participative human relations and high profile personnel leadership are more characteristic of the starting phase, when successful recruitment and motivation of labour loom very large - accordingly once the plant is established other priorities begin to assert themselves.” (Wilkinson & Ackers 1995 p850)

TQC

The relationship between TQC and Hoshin Kanri has been discussed in Chapter Two and NYEL operated according to TQC principles and practices with a way of working based around the TQC story. On the establishment of the company a development programme based upon TQC was established at all levels, beginning with senior management and using parent company staff as advisors. This programme ran over three years.

The organisation of the production process changed throughout the course of the research, and these changes reflected further developments of a lean way of working. Operators were organised in teams, and the teams were designated work which was organised according to lines. At the beginning of the research period the lines were dedicated to producing parts for one or other of the cars. For example ABC and D line would produce parts for the Primera, and EFG line would produce parts for the Micra. The operators were trained to work across a number of cells which would comprise their area of working.

There was flexibility across the teams as demand conditions for either of the cars would determine the number of team members at any one time. The teams were managed by a team leader and were responsible for meeting production and quality targets. Operators worked according to standard operating practices, carrying out routine quality checks as part of the process, and were responsible for halting the process should quality concerns arise. Self-monitoring was visibly evidenced as part of the shop floor operation.

An audit process for housekeeping based upon the Japanese 5 S system was in operation, and operators were trained to undertake routine maintenance. This was being developed to include preventative maintenance. Visual management was used to a high degree with large numbers of noticeboards in every area of the operation. These were used generally on the shop floor to indicate progress towards current targets, and more specifically by lines to monitor progress on their performance indicators.

The quality department was subdivided into a quality control (QC) section and a quality assurance (QA) section, with the QC section responsible for supporting the production operation in solving immediate concerns, while the QA section developed the means through which quality was inbuilt at every stage of the operation.

NMUK actively encouraged NYEL to continuously improve working practices. To assist in the development of continuous improvement, NMUK's Supplier Development Team (SDT) worked alongside of NYEL's Kaizen Team focusing attention upon issues such as economy of motion, elimination of waste and total productive maintenance. The Kaizen Team were a dedicated group of four people seconded from their usual

work for an unspecified time and membership included a section manager, team leader, operator and a Japanese advisor.

The focus of attention of both the Kaizen Team and the SDT was upon the operation of one particular cell which they termed a 'model line', this was to be continuously improved to provide an exemplar of best practice. The role of the teams was to examine the operation of the cell, and to implement improvements based upon the developments of lean production practices and then disseminate the learning gained as a result of this to the rest of the operation. This was done through a four day concentrated activity called a Kaizen event, which included members of both teams and cell operators and team leaders. Throughout the four days the PDCA cycle would be turned and an improvement would be planned, implemented, checked and where necessary revised. The learning gained from this was put into practice when the reconfiguration of the shop floor, which will be discussed in Chapter Nine, was carried out. This practice of supplier development is common in Japan where manufacturers try to establish and maintain a co-operative relationship with their suppliers in order to improve quality:

"Positive guidance and QC educational services are made unsparingly available by the company on the understanding that voluntary efforts will be made by the suppliers."

(Kondo 1989 p35F.20)

Another aspect of the improvement activities within the organisation were the existence of TQC themes which were managed by small teams (usually no more than four people) who focused upon a particular improvement; in May 1997 there were fourteen such teams. Improvements which became the focus of TQC themes emerged both from the

top and the bottom of the organisation. A team could be formed to look at a particular theme which was highlighted as a result of translation of annual policy. One example of this emerges as a result of the study in Chapter Eight. Themes could also emerge as a result of the Kaizen scheme which was in operation in the organisation. One example of this emerges as a result of the study in Chapter Nine.

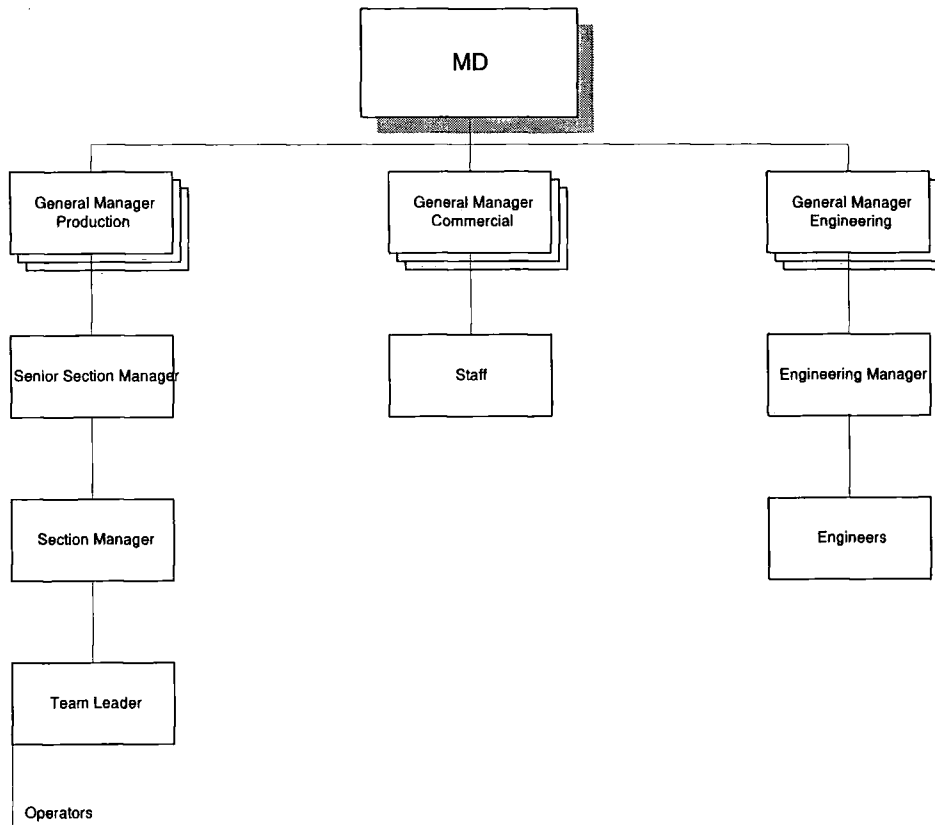
The Kaizen scheme encouraged individuals to think about ways in which work processes could be continuously improved, and to put forward any such ideas for consideration. The feasibility of ideas were considered by a designated team, and while some ideas could be implemented quite easily, some of the ideas required a team effort and became the focus for a TQC theme. Following implementation of a Kaizen idea a judging panel would award a cash prize of £50 on a monthly basis for the best idea based upon cost of implementation, effect on efficiency, ease of working and cost saving.

TQC themes were also the subject of competition as the four judged to be the best went forward to a final competition on an annual basis. The winning theme was then entered for a competition held at the parent company in Japan. While this is contrary to the principles of TQC as proposed by Deming (1986), this practice of competition was not restricted to Western organisations, and was encouraged by NYEL's parent company in Japan. Further evidence of NYEL's status as a TQC organisation was the accreditation of recognised awards, ISO 9002 and QS9000, which is a quality assurance system designed by the automotive industry for the automotive industry, and which encompassed ISO 9000.

Organisational structure

The organisational structure was flat with no more than six layers.

Figure 6. 1 NYEL Outline Organisational Structure (1996)

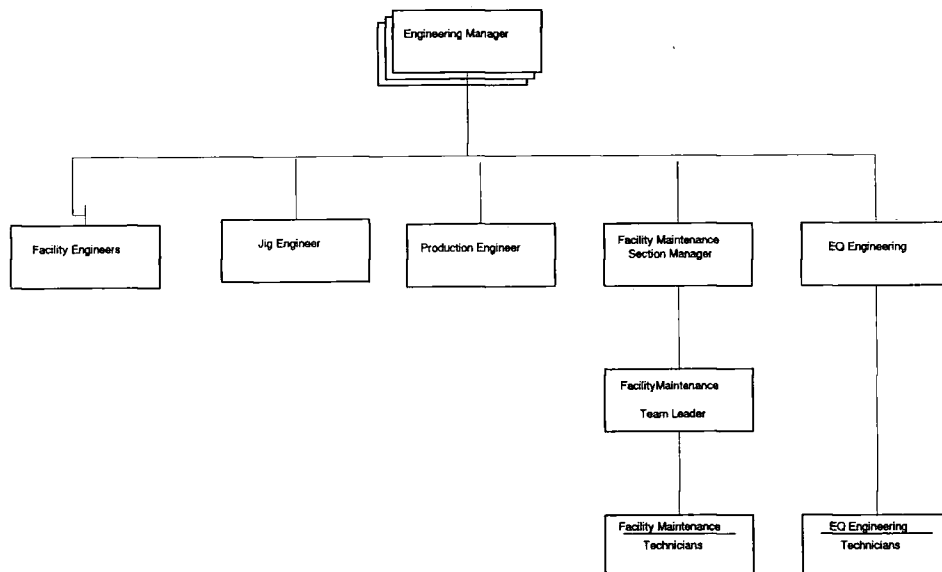


Although the organisational structure remained flat there were continuous changes within that throughout the research period. In 1996 there was a reorganisation of the shop floor in order to support the production of the new Primera car in October of that year. The rationale for the change was a further development of lean production through a re-ordering of the way in which maintenance support for the production process was organised. According to the General Manager the organisation had experienced problems previously because there was inadequate direction given to the maintenance department generally, with a lack of individual accountability because of

an absence of clear individual targets. Additionally the allocation of tasks led to the maintenance staff being spread too thinly across production.

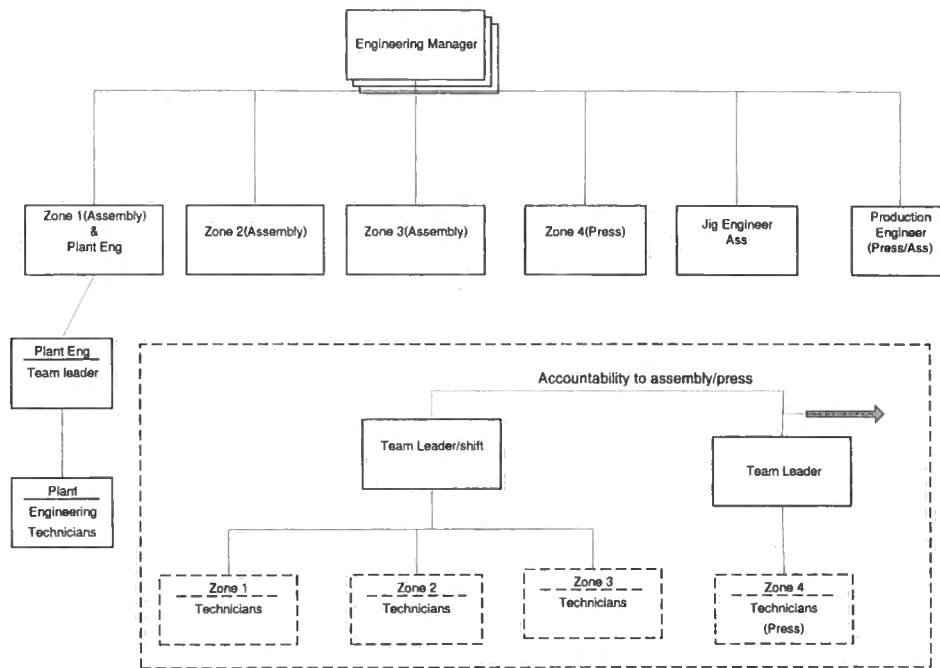
The change involved dividing the assembly and press operation into four zones; zones 1-3 encompassed assembly operations and zone 4 the pressing operation. The maintenance department, which had previously reported to the engineering manager through a section manager, was to be organised in such a way that a team of maintenance technicians under the leadership of a team leader were dedicated to a particular zone and reported directly to the appropriate production manager. The reporting structure prior to the organisational change can be seen in figure 6.2 below

Figure 6.2 NYEL Engineering Department pre- structural change



Under this arrangement the maintenance technicians worked with team leaders and a section manager who reported directly into the engineering function.

Figure 6.3 NYEL Engineering Department post-structural change



The structure which resulted can be seen in the above figure as the reporting lines for those positions indicated by dotted lines changed, moving from engineering-led management to production-led management. The anticipated result of the change was to develop semi-autonomous units responsible for determining their own priorities in terms of maintenance, thus making maintenance staff more accountable through the production departments, and ensuring that specific objectives and targets existed for which there would be accountability. Additionally the maintenance technicians' shift pattern changed as the number of shifts were reduced from three to two to follow the production process, thus increasing the number of maintenance technicians available on each shift.

The introduction of zoning affected all production related and supporting activities. The engineers within the production engineering department were dedicated to individual zones and were responsible for supporting the engineering requirements of each of these. The quality department adopted the same practice as engineering in zoning technicians, it was the intention however to rotate the staff to ensure skill flexibility. Dedicating technicians to zones for a fixed period of time allowed specific targets to be set relating to preventative concerns. The section manager who had previously managed the maintenance team remained within the engineering function as an engineer dedicated to a particular zone. The engineers' and quality personnel reporting structures remained unchanged.

Responsibility for implementation and communication of the change was devolved to individual managers. The change was implemented at the beginning of May 1996, and mirrored practice as reported by Wilkinson et al (1995) in the Japanese owned automotive plants in Wales, where production was characterised by this form of organisation.

Difficulties arose which were attributed to the way in which the change was implemented and managed. There was confusion within the management team, particularly with the Engineering Manager, who suggested that a lack of discussion and communication resulted in a confusion over delineation of responsibilities and he found himself with unanticipated responsibilities:

"One of my engineers has actually inherited some of the work from facility maintenance because the production manager said that the people in the zones are responsible for

production maintenance only, anything else - kettle breaks down, door jams that is plant which I have inherited." (Engineering Manager)

The way in which the changes were managed had the potential to impact upon the Hoshin Kanri process, as there appeared to be a lack of understanding (particularly within the engineering department) as to why they had taken place. This was creating artificial barriers at the level of the management team. The concern was also expressed by the former Maintenance Section Manager that it would reduce flexibility across the organisation and put up artificial barriers at an operational level:

"Instead of looking at one pool of men and where you put your resources, you have two separate pools (Press & Assembly) because there are different structures."
(Maintenance Section Manager)

There was further potential for the Hoshin Kanri process to be affected by the way in which individuals approached management of their own objectives if they adopted a parochial stance:

"I will probably be more motivated with the areas within my zone - I will help somebody out, but it will be a verbal, rather than a case of I will come and do the job for you - unless he is obviously struggling. But I will be taking more interest in my area and keeping my production people and my area happy. So there will be more focus, less global more parochial I would say." (Engineer)

Original concerns expressed about potential operational problems proved to be well founded when issues arose as a result of a lack of clarity regarding delineation of

responsibility. One of the examples of the way in which this was impacting, and was a concern expressed in the initial stages of the change, was the reordering of spares and training:

“There will get to a point where they will be going and there will be no spares. Nobody has really taken responsibility for those things because it was the maintenance section manager who pulled everything together and the communication between the shifts. If you look at the maintenance workshops now they are very disorganised. There are a lot of grey areas of who does what now. I think they should have spent more time looking at the factors which would be involved in the change and the implications.” (Engineer)

This was contrary to view expressed by one of the senior managers the week prior to this who was of the opinion that the restructure was working well.

Later in the same year action was taken which suggested that the review process was operative in the organisation when, as a result of the problems encountered, a section manager from production was appointed to take overall control of the maintenance department. The remaining production section managers had their areas of responsibility changed, and this altered the way in which the assembly shop floor was delineated into zones.

The perception of the Engineering Manager was that the combination of taking responsibility for some aspects of maintenance with a reduced staff, and a lack of commitment from production to make time available for maintenance support, restricted the amount of time which was available for project work. While this may have

indicated shifting priorities at an organisational level as production concerns dominated, this was not well understood.

The changes begun in 1996 through zoning were further developed later that year with a change to the senior management of the organisation when the Assembly Manager was appointed as General Manager in charge of production. Responsibilities were divided in such a way that production and engineering had distinct reporting structures, and this was further developed in April 1997 when additional changes resulted in responsibility for production engineering and quality inspection moving from engineering responsibility to production responsibility. This ensured that all production-based activities were managed through the Production General Manager. The Engineering General Manager was to oversee project work and supplier quality. His input into the production process was in terms of new product development and introduction.

This change furthers the Japanese approach of production led organisations and follows reported practice in Nippondenso, Japan's principal automotive components manufacturer, reported in Westbrook (1995), where the engineering department was responsible for all aspects of development and design of a product, and the manufacturing division was responsible for all aspects of preparing for production and manufacturing.

Summary

NYEL was founded in the North East of England to support the production of cars by its major customer NMUK through the provision of pressed steel parts and sub-assemblies. This close relationship impacted not only upon the strategic decisions taken but also upon operational developments. Japanese ownership influenced the development of the management of people and human resource practices, and there was some evidence to suggest that the expectations of the parent company of NYEL had changed over time.

Over the time of the research there were significant changes in demand conditions and the introduction of new models, including the third car, had major implications for the company. The way in which the further development of lean working practices were managed, including the structural reorganisation, and the continuously changing demand conditions are significant issues for Hoshin Kanri and their impact will be considered in the studies that follow.

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**CHAPTER SEVEN:
HOSHIN KANRI AT NYEL**

Introduction

In this chapter NYEL's Hoshin Kanri process is outlined. The chapter is divided into two main sections. In the first section the NYEL model of Hoshin Kanri derived from analysis of company documentation is presented. In the second section this model will be outlined in light of the research. The process is discussed using the conceptual framework derived through the literature review and presented in Chapter Four as the FAIR model. The term used for the process within NYEL is Policy Deployment.

Background

The Engineering General Manager was influential in the development of the Hoshin Kanri process within NYEL when he held the position of General Manager responsible for all aspects of operations. His view was that Hoshin Kanri was not implemented in NYEL *per se*, rather it evolved out of TQM as a "*common sense way of doing things.*"

(General Manager)

Hoshin Kanri was:

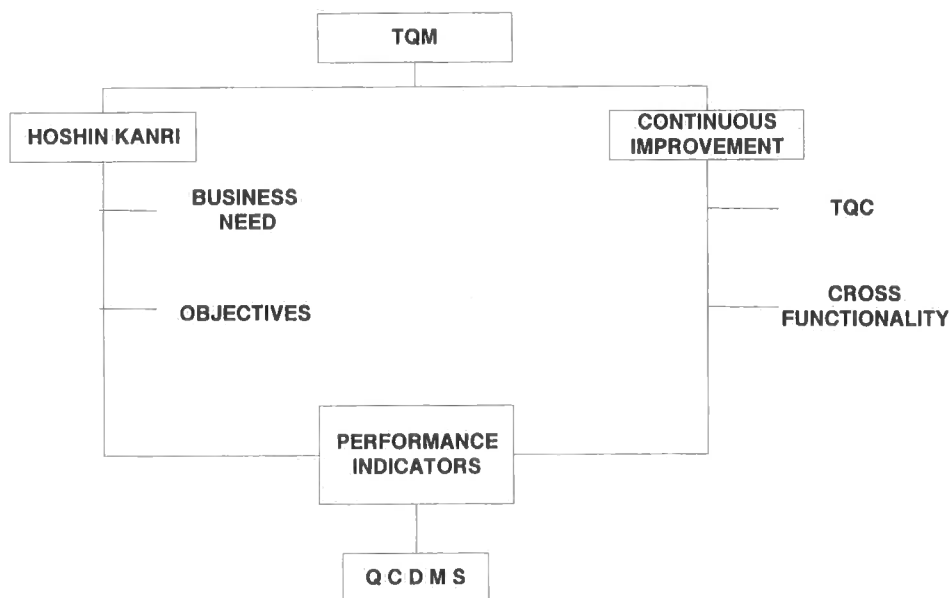
"A tool for managing the whole business", and the importance of this was its role in linking the vision of the organisation with its day-to-day management:

"This is an important tool to understand at any point in time how the business is performing on a day-to-day basis. Too many companies operate with quantifiable measures that are not related to the contribution to the business..... The objective of

measurement is to know how you are performing. But against what and for what? All measures should be against a target that links in to company objectives and ultimately the vision of the company." (General Manager)

Hoshin Kanri was a key process around which TQM revolved as can be seen in Figure 7.1 below.

Figure. 7.1 Hoshin Kanri and TQM at NYEL



(Source: Cobb 1996)

According to this figure continuous improvement is managed through knowledge and application of TQC and a cross-functional way of working; this can be seen to equate to daily control as explained by Akao (1991). Hoshin Kanri is managed through an understanding of the requirements of the business (Business Needs) and policy-based objectives. Hoshin Kanri and continuous improvement are integrated through establishment and management of Quality(Q), Cost(C), Delivery(D), Morale(M) and Safety(S) performance measures. The QCD categories of TQC and Hoshin Kanri are

familiar, and have been the subject of discussion in previous chapters. The Morale(M) and Safety(S) categorisations relate to employee issues which include training, absence, sickness and health and safety issues.

The degree of change that results from the Hoshin Kanri process is not clear from the above Figure, however, in later documentation, the process is said to provide the means for:

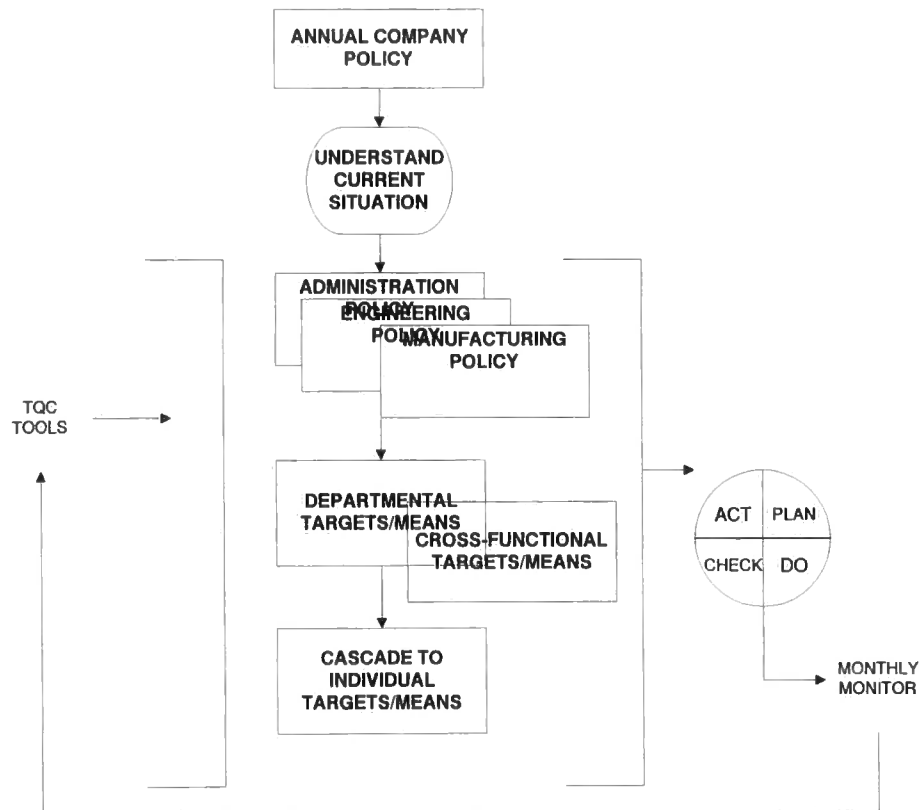
“Creating and managing continuing radical change.” (General Manager)

Hoshin Kanri was first used in NYEL in 1993 to manage the organisation’s first mid-term challenge Best in Group 1996 (BG’96). For the first time in that year a series of interlinking statements were made regarding the organisation’s philosophy and its view of the future. While it may have been the case that there was no decision at the top of the organisation to implement Hoshin Kanri *per se*, and what is suggested is a development of the process, the model outlined has a strong correspondence to that model used by Toyota in Japan (for example see Akao 1991).

In fact, as was common in this sector, NYEL had strong links with other suppliers in the automotive industry, this was particularly the case in sharing technical skills. One of the engineers reported spending several days at a Toyota company to study a technical problem associated with the welding process. Given the closeness of the relationship between NYEL and its main customer NMUK, and the transfer of learning which occurred regarding the production process, it is highly likely that the model of Hoshin

Kanri used was influenced by practice in other organisations. NYEL's Hoshin Kanri model can be seen in figure 7.2 below.

Figure 7.2 NYEL's Hoshin Kanri Model



(Source: Cobb 1996)

The figure shows the translation of annual policy into engineering, administration and manufacturing policy; this has been informed by an analysis of the organisation's current status. These policies are translated into cross-functional and departmental targets/means which are further translated into individual targets/means. The continuous turning of the PDCA cycle ensures that on a monthly basis, through the application of TQC tools, activities can be re-evaluated and, where necessary, revised.

The documentation relating to the Hoshin Kanri process was held in a working file called 'the Management Review' containing all of the top level policy documents, strategy meeting agendas, minutes, quality review, and results. This was held by the General Manager and was used as a working tool at relevant management meetings. Its value was perceived as giving an at-a-glance guide to how the company was performing:

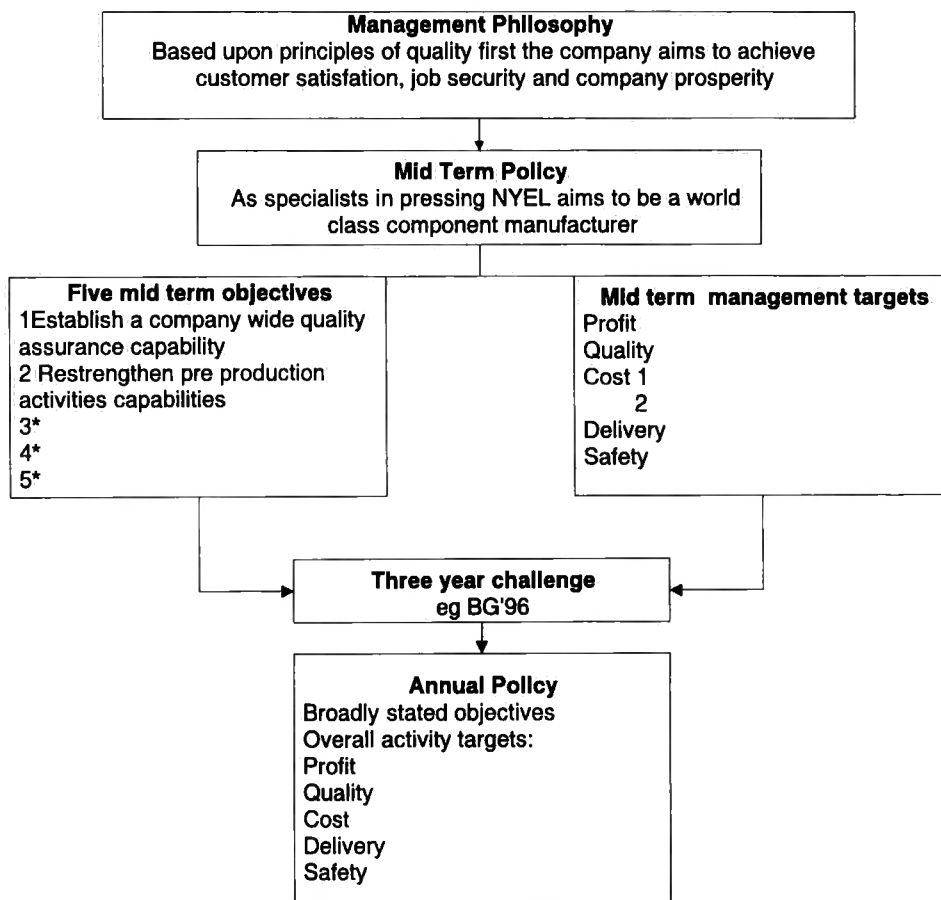
"this is how we run the business. In this we have the contents of all the activities, the management philosophy, the production engineering policy and the targets for production and engineering." (General Manager)

What follows is an explanation of the NYEL model using the FAIR model of Hoshin Kanri presented in Chapter Four.

FOCUS

While it is noted that figure 7.2 above does not show the management philosophy, according to company documentation this is the starting point for the Hoshin Kanri process. figure 7.3 gives a more detailed account of the way in which mid-term policy is translated into annual policy as shown in figure 7.2, and this is explained more fully below.

Figure 7.3 Translation of Annual policy from Management philosophy



Management Philosophy

The documentation in the Management Review began with a statement of management philosophy which provided the context within which prioritisation could occur and

decisions could be made. The origin of the statement is unclear. However, its form corresponds to practice at Toyota where the management philosophy is seen to provide: *"..upper management's opportunity to clarify the vision in the context of TQM .. and how the vision is to be achieved."* (Aka0 1991 p128)

Management Philosophy

"Based upon principles of quality first the company aims to achieve customer satisfaction, job security and company prosperity."

The organisational aspiration to achieve customer satisfaction, job security and company prosperity requires a focus upon quality. This is consistent with TQC literature which argues that quality is the foundation for organisational success.

In TQC organisations customer satisfaction requires a focus upon QCD policies, and this focus results in an enhanced company reputation, enabling a broadening of customer base: hence job security and company prosperity.

Mid-term policy

The management philosophy was followed by a mid-term policy which stated the nature of the organisation's business, and what it aspired to be.

Mid-Term Policy

"As specialists in pressing, NYEL aims to be a world class component manufacturer."

World class for NYEL was judged according to benchmarks provided by the Japanese plant, and related to a range of measures which were available across the operation and included parts per million defects (PPM), strokes per minute (SPM) achieved in the pressing operation, die set-up times and work in progress (WIP).

The mid-term policy was supported by five mid-term objectives which included, 'Establish a company wide Quality Assurance capability' and 'Re-strengthen pre-production activities capabilities.' Within the documentation these mid-term objectives were then broadly explained in QCDMS terms. This can be seen to equate to Akao's argument that organisational vision must be supported with a quality policy, which is understood to comprise organisational aspirations regarding QCD.

The final element of mid-term management policy were six mid-term management targets, which detailed specific targets for Profit, expressed as a percentage profit rate; Quality, expressed in parts per million defects; Costs, expressed as a percentage productivity improvement and a percentage rationalisation of turnover; Delivery, expressed as the number of incidents of missing deliveries; and Safety, expressed as the number of accidents. Targets for each category were detailed for each year over a three-year period.

Challenges

NYEL used three-year challenges as a vehicle to manage mid-term policy. The challenges took a form which replicated practice at NMUK, and incorporated NMUK's requirements. These requirements were linked to the system of supplier assessment as discussed in the previous chapter, and were usually expressed according to QCDDM categorisations; these were reflected in the mid-term management targets as expressed in QCD terms.

Best in Group 1996 (BG'96) was a three year challenge which flowed from NMUK's 'NX'96' programme, and encompassed the objective to become the best supplier in the group of first tier suppliers as assessed by NMUK according to QCDDM categorisations. 'NX', Nissan Excellence, represented NMUK's mid-term challenge to further improve world class standards of manufacture according to a range of standards benchmarked globally. The BG'96 Challenge began in 1993 and ended in 1996, and was followed in 1997 by 'Flex 21', 'Forward to Level Excellence' which was to end in the year 2000 and which supported NMUK's 'NEXT 21' (Nissan Excellence towards the 21st century programme), which focused upon a variety of organisational improvements including supply chain improvement.

The close correspondence between the two organisations' challenges raises the issue as to the degree of freedom NYEL had in practice in determining the strategic direction of the company. There were two factors which affected this freedom, the first of these was the position that NMUK held as NYEL's major customer. While NYEL was working to broaden its customer base, as a percentage of business supply to other customers remained small. The second was the impact upon the organisation of NMUK's share ownership which resulted in NMUK representation on the board of NYEL. The change in ownership of the company occurred too late in the research period to determine whether this would have any impact on the establishment of policy.

The effect of this relationship upon NYEL's strategy was evidenced by the interlinking of challenges, and the decisions made as a consequence of NMUK's decision to build the third car, the Almera, at its Sunderland operation. The management of the supply

chain by NMUK, and the close linkages which existed between the two companies, impacted upon other areas of policy outside of quality, cost and delivery issues. One example of this is the reconfiguration objective discussed in Chapter Nine.

The challenges dealt not only with targets which related to the customer-focused categorisations of QCD, (for example the objective to “broaden customer base”). There were also those objectives which were confidential in nature relating to issues such as the development of new technology or product innovation, which because of their sensitivity remained with senior management until activities which translated from them had an operational impact.

The targets established as a result of the challenge formed part of the annual policy. The activities of the organisation, by virtue of its close relationship with NMUK, were dominated by the need to support the introduction and production of new models.

ALIGNMENT

Annual policy

Development of annual policy began in October when the General Manager examined progress for the previous three quarters as measured through a continuous process of review, comparing anticipated with expected results. Once the current status of the company relative to the current annual policy had been determined in this way, the General Manager determined which activities were still relevant and needed to be carried forward to the following year.

The perception of the General Manager was that the influence of the parent company at this stage of the process was minimal; in this sense the company remained an autonomous unit. The interests of the parent company were safeguarded however by the presence of the Japanese MD who was accountable to the parent company for the performance of the unit. The incorporation of the MD's views regarding the future direction of the company into the annual policy was not perceived by the General Manager to be the outcome of a negotiated process:

"..he tells me - within reason of course. His objectives have a global perspective.... He understands the Japanese side, he is obviously involved in what the parent company wants." (General Manager)

Having assessed the current condition of the company, taking into account the views of the MD, the requirements of the customers, and the mid-term policy, a draft annual policy was drawn up by the General Manager. This document became the subject of discussion between the General Manager and MD. The outcome of this discussion was a draft annual policy document, which focused upon the priority for the whole organisation for the year expressed in broad terms. For example 1996 annual policy focused upon the need to support the launch of the new model, the Primera facelift:

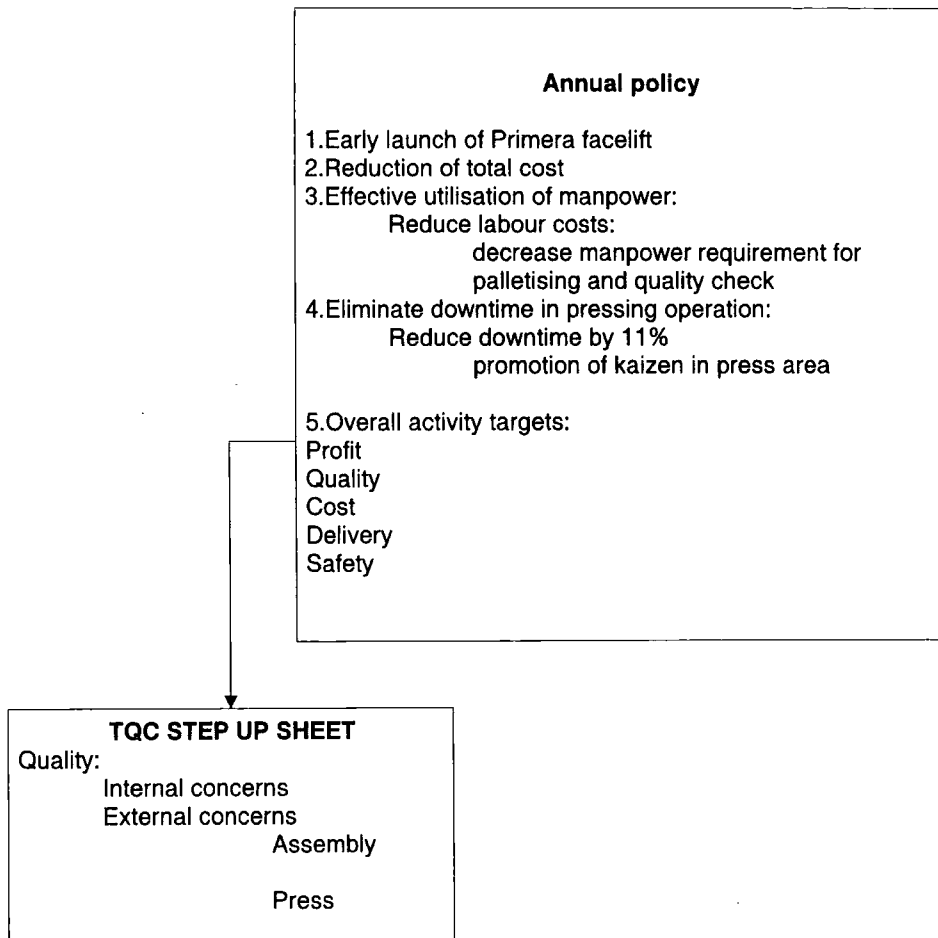
Annual Policy

"The EQ (Primera facelift) launch is the activity for the entire company and without the successful launch of EQ, NYEL cannot claim any justification for its existence."

This statement was meant to clearly indicate to the rest of the organisation the company's priority for that year, providing a focus for all other organisational activities.

The way in which annual policy as shown in figure 7.3 was further translated can be seen in figure 7.4.

Figure 7.4 Annual policy at NYEL



Annual policy translated into four management targets and associated with each of these were the means through which they could be achieved, for example the objective to effectively utilise manpower was translated into a target to reduce labour costs, and one of the means associated with this was to: 'decrease manpower requirements for palletising and quality checks',

The objective to eliminate downtime in the pressing operation translated into a target to reduce downtime by 11% and one of the means by which this could be achieved was promotion of kaizen in areas associated with press productivity such as die set-up. The degree of specificity in terms of means to achieve targets translated from the objectives increased as the process progressed.

Alongside these management objectives were the overall activity targets which derived from the mid-term management targets, and which related to profit, quality, cost, delivery and safety targets for the whole organisation. These formed the basis for the annual activity plan which was called the TQC step up sheet. This was used to detail the translation of overall management targets into more specific targets for all areas of the organisation. This can be seen with reference to figure 7.4 above, and equates to the development of engineering and manufacturing policy in figure 7.2

These five management targets were further subdivided into 24 targets for the organisation categorised according to QCDMS by the General Manager through the application of the TQC story. For example, quality targets were further divided into internal and external concerns as expressed in parts per million defects. Internal concerns related to problems identified within the organisation when routine quality checks carried out by the employees as part of their daily work highlighted products which were not within the pre-specified control limits; a non-conformance form would be raised for each of these. External concerns were problems identified by the final customer, and were classed as customer concerns. These were further subdivided into press and assembly operations, and then further subdivided in the pressing operation

according to the pressing machine, and in the assembly operation according to the car the part was made for.

The GM presented the draft annual policy which outlined the management targets and overall activity targets in the form of the TQC step up sheet to the management team which comprised: the Engineering Manager, the Quality Manager, the Assembly Manager, the Press Shop Manager and the Commercial Manager. The management team used the proposed policy as a base from which to formulate policies for their own individual areas of responsibility.

Where policy involved objectives which would require cross-functional co-operation and management, ownership of these objectives was delegated to a member of the team, subject to the agreement of the manager concerned. One example of such a situation will be discussed in Chapter Eight. Managers owned objectives which directly related to their areas of responsibility. Where the objectives were cross functional there was no set pattern to the way in which objective ownership was decided upon.

The formulation of policy by the managers was not an exercise which was done in isolation, but required the team to consult with subordinates (in this instance section managers, or engineers) to discuss possible alternative courses of action. The consultation process was a mixture of formal and informal meetings. Informally the managers would test out ideas with other managers and subordinates, formally they would hold meetings with subordinates where tentative activity plans would be discussed on an individual basis.

Following this consultation process there was a management meeting at which each of the managers presented the policy for their areas of responsibility. The purpose of the meeting was to achieve agreement of policy at a departmental level, from which the departmental activity plans which supported this were finalised.

INTEGRATION

Departmental activity plans became the base for activities at lower levels of the organisation as the broad objectives which had been translated into individual target/means became the focus for action. As a result, implementation plans were agreed between members of the management team and respective Section Managers/Engineers. Individual target owners drew up schedules for activity which were agreed with next line managers, and dependent upon the nature of the activity would progress accordingly.

This was more difficult when the objective required co-operation from other employees, either within the same department or from another. In this instance progress towards achieving the target required informal negotiation with other employees to gain support for action.

REVIEW

Implementation of plans was followed by a systematic process of review. The review process was occurring continuously on an hourly, daily, weekly, monthly, quarterly basis. Daily reviews were the focus for a rapid response meeting held each morning in the production area, led by the General Manager. The purpose of these reviews was to

deal with production concerns which had arisen over the previous day, for example if the customer had experienced a problem; such reviews were reactive and action-centred. Weekly reviews dealt with those issues which were a priority for the organisation and were carried out at various levels, for example the commissioning of new cells when a new model was being introduced. Monthly reviews tended to be more strategic as targets established as a result of the translation of annual policy were reviewed at a formal meeting of the management team. Individual managers reported progress on their areas of responsibility, and highlighted areas where problems were occurring which may require action.

Each quarter a strategy meeting was held which reviewed the previous quarters' results to establish if corrective action was required. If necessary, targets were adjusted throughout the course of the year, and where situations changed there would be a reallocation of resources to enable the organisation to focus accordingly. At the end of the third quarter the results from the review process were used to inform the next annual planning round, and the cycle began again.

On an individual basis there was a quarterly review of progress towards objectives with next line managers where decisions were made regarding corrective action if necessary. There was also a link with individual annual appraisal, however individual target achievement formed only a small part of a possible percentage increase in remuneration as a result of this.

Timetable for the annual Hoshin Kanri process

The timetable for the Hoshin Kanri process can be seen in figure 7.5 below

Figure 7.5 Timeframe for the annual Hoshin Kanri process

ACTIVITY PLAN	OCT	NOV	DEC	JAN	FEB	MAR	WHO
ANNUAL POLICY		Ø					MD
CURRENT CONDITION	—						GENERAL MANAGER
DEPARTMENTAL POLICIES		—					GM/MANAGERS
ACTIVITY PLANS			—	DRAFT PLAN			MANAGERS
CASCADE THROUGH				—	FINAL PLAN		TOTAL COMPANY
SUPERVISION BRIEF				Ø			MANAGERS
PLANT BRIEF					Ø		GM
MONITOR					Ø	Ø	MD

The process began with the General Manager in October, and continued with the development of plans through a series of iterations between different levels within the company until a final annual plan was agreed upon by the middle of January. The steps towards this are outlined above as policies were established and targets & means agreed resulting finally in activity plans which supported annual policy.

The top-level annual policy was communicated to the whole of the organisation towards the end of January. At the beginning of the research this was carried out through a plant-wide brief which provided information regarding the financial and quality performance of the company, customer expectations and demand conditions. These briefings did not provide an opportunity for raising individual questions, but individuals had the opportunity to raise pertinent issues with their line managers. Additionally

plant-wide briefs were held on a quarterly basis to update employees on the performance of the organisation in those areas previously mentioned.

Towards the end of the research the nature of the briefing sessions were altered as senior management decided that the organisation had become too large to communicate in this way. Communication of company-wide information became the responsibility of managers within their own areas. This follows practice as reported in other Japanese organisations which reflected a development of line management responsibility. Following communication of the annual policy plans were implemented and the review process began; the full cycle of review is not reflected in the above figure.

DISCUSSION

This section draws upon analysis of interview transcripts and supporting documentation to provide an insight into organisational perspectives of the FAIR model of Hoshin Kanri within NYEL.

FOCUS

The outcome of this stage of the process was focus for action at each organisational level. This was achieved through prioritisation, highlighting those issues which required major change and establishing organisational purpose which provided a context for individual action. Those elements which comprised the focus stage of the process were well documented and appeared to follow the Toyota model for Hoshin Kanri. (Akao 1991) Activities remained firmly at the senior levels of the organisation and were the province of the General Manager and MD.

Prioritisation

There existed a clear link between management philosophy, mid-term policy and the mid-term challenge used to manage this. The number of objectives which comprised annual policy (five) was at the extreme end of the number suggested as optimum in the literature. Too many top-level objectives can result in a proliferation of objectives further down the organisation as the translation process occurs, causing a loss of focus.

The establishment by the General Manager of the 24 objectives which resulted from the mid-term targets categorised according to QCD, suggests a degree of involvement at the top of the organisation at a later stage in the process than would have been anticipated. Later discussion will show that these targets were broadly stated and open to a process of negotiation.

Providing organisational context

Another outcome of this stage of the process is the provision of a context within which individuals can understand how what they are doing contributes to the whole organisational effort. The parallel is often drawn between the bricklayers who understood their job in terms of laying bricks, building a wall and building a Cathedral. The ability to foster detailed understanding of annual policy at lower levels of the organisation was seen as unrealistic:

“How as an operator you could gain an understanding of these targets (the twenty four targets mentioned above) I don’t know.” (Engineering Manager)

The importance rested not in providing individuals with an in-depth knowledge of the organisational targets, but in making work meaningful for them:

"The lower you get down the structure the cloudier it becomes. I would hazard a guess that our operators know more (about the longer term direction of the company) than any other organisation because there is a plan there... the whole idea of this cascade effect is to take the unmanageable bit, break it all down and everyone gets a piece of it, and if he does that then you have won. If you start talking about unmeaningful things then people switch off." (Engineering Manager)

This view was borne out by those at lower organisational levels who found the plant brief boring and did not feel a need to understand what the longer strategic direction of the company was. The efficacy of the plant brief was questioned:

"When we went through the BG'96 exercise this was briefed company wide but not departmentally, and everyone used to say, 'What is this BG'96?' They knew what it was, but no one had really spoken to them about it, no one had explained to them, 'Well this is our role, this is what we are going to do and this is how we are going to get there.'" (Quality Section Manager)

As previously noted, the way in which organisational members were briefed changed throughout the research period as the plant brief was replaced by departmental briefs.

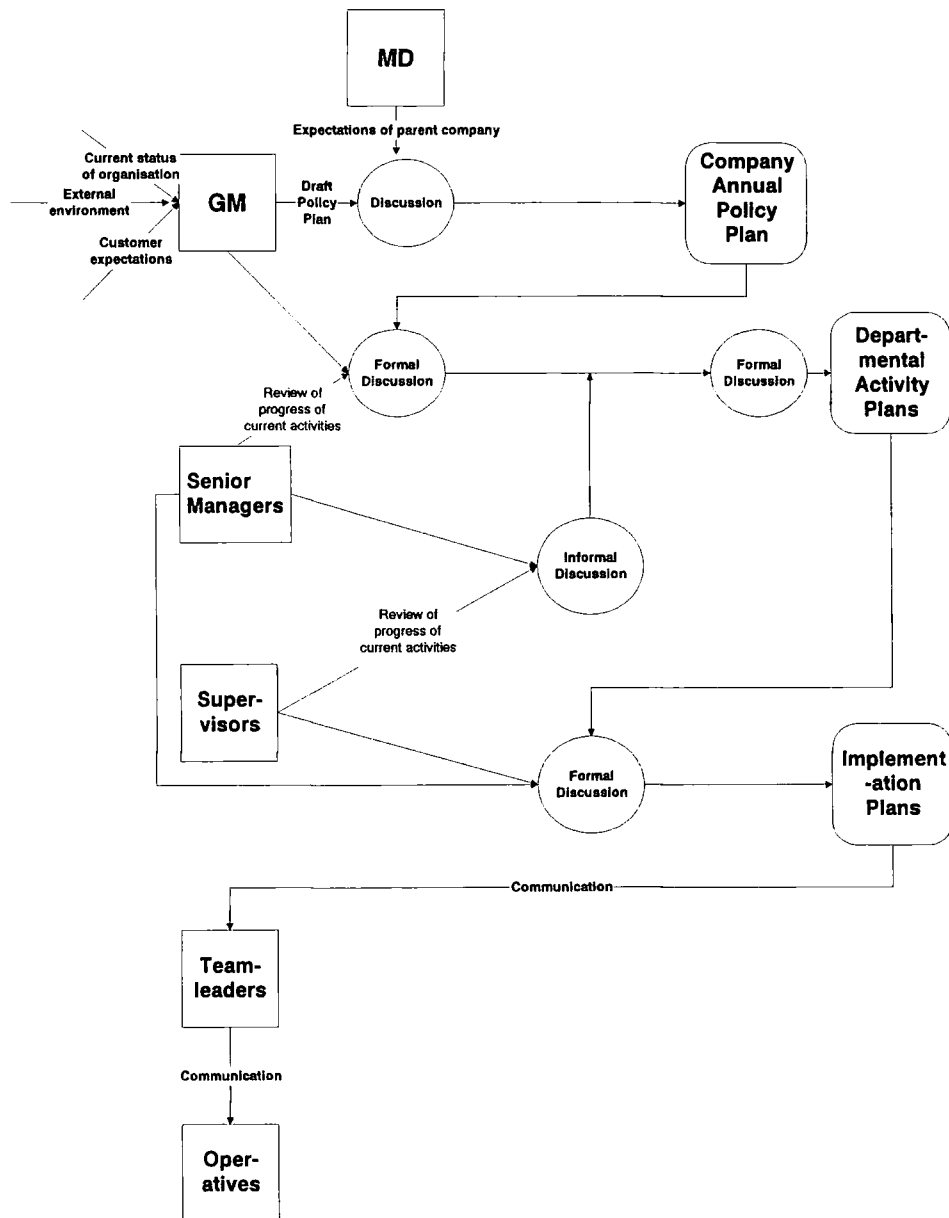
While there was recognition of the difficulty in providing an overview of the policy, an expectation of the management team was that individuals would be aware of the company-level QCDMS annual targets which translated from mid-term management targets.

ALIGNMENT

Development of target and means

The research suggested involvement in the development of targets and means as shown in figure 7.6.

Figure 7.6 Development of target/means at NYEL



At the level of the management team, development of targets and means began with the initial meeting with the General Manager, who perceived the draft annual policy as:

".. just a seedbed for germinating new ideas really.....they will come up with ideas I have not thought of and tell me if they think I have missed anything."

The management team brought to the meeting expertise of their own particular area which enabled them to give a realistic feedback on the proposed targets, and to determine from annual policy their own individual objectives:

"...the MD had a vision, and the GM had a vision which went down to my management level. The way I got my objectives was to look through this and see what 'jumped out' as something I could contribute towards." (Production Manager)

At this level the 24 targets were seen as broadly stated thus allowing a degree of freedom in determining the appropriate means through which they could be achieved:

"The very global targets - each one of these could be translated into ten different categories, like where we have got 1200 tons transfer/strokes per minute (SPM) or efficiency, that is translated into departments as, what is the downtime that makes, and what efficiency, and what are we doing about this; how are we reducing downtime."
(Production General Manager)

The targets were seen by members of the management team as challenging, and this required an acknowledgement that it would not simply be sufficient to 'do things better', but target achievement necessitated 'doing things differently'.

"I think that by putting the targets in line for each department it makes people question how they can do things better, how can I achieve my targets, if I do not achieve my targets what can I do about achieving them next time, can I do something different in my job?" (Quality Manager)

This goes beyond the managed change suggested by Akao (1991), to the creation of an organisation which is open to continuous change:

“We have this way of working where we make major changes in the company every year or two years - constant change.” (General Manager)

One example of this given by the Engineering General Manager was the rationale for the change in the organisational structure as noted in Chapter Six when the concept of zoning was introduced:

“The structural change is doing things differently to achieve our objectives, to move away from stagnation point. You try to do the same things every year and you need to change..... well we are very very lean now, we do not have the free labour we have had in the past, we have to generate the improvement by using the labour we have, and the only way to do it is to restructure the labour.” (General Manager)

Central to the development of target and means was the process of communication which was carried out at both a formal and informal level. At the top of the organisation meetings were used by the managers as a means of proposing alternative courses of action or changes to the original policy and plan as proposed by the General Manager:

“The presentation to the management group is the way I see it.....they then go away and talk to their supervisors and come back and say, ‘this is what we are going to do, yes we can achieve this, and no we cannot achieve this...’ (General Manager)

The meetings provided a useful forum for the sharing of ideas, testing the feasibility of different courses of action and gaining support:

“The meeting is a levelling exercise, to make sure that everyone has communicated to everyone else what they are doing. Before they come to that meeting they will already have spoken to each other to negotiate the level of support that they need from each other. So they interact before they come back to me.” (General Manager)

The informal communication that was evident was multi-level and can be equated with the informal consultation process which is reported in Japanese organisations and forms part of the decision making process: *“Nemawashi.”* Fukuda (1998) explains Nemawashi as a horticultural term which refers to a process of preparation to the roots of a tree which is vital for successful transplantation:

“It is a process very similar in spirit to informal talks preceding the formal submission and circulation of a proposal. The abrupt submission of a proposal without Nemawashi is seen as a lack of sensitivity contrary to the Japanese spirit, which reveres the preservation of a harmonious atmosphere within an organisation.” (Fukuda 1998 p 66)

The formal meetings held further down the organisation encouraged participation in translating targets and means:

“At a meeting I showed them (next line reports) what the MD’s and GM’s vision was. I told them the issues I had picked out and why, I asked them to have a look and see if they could see anything else, because I would rather build this as a team thing than be directive, imposing actions upon people. This is generally the way NYEL goes about things. They went away with that and came back with their ideas... I then worked with them to help them develop what they came back with.” (Engineering Manager)

Latitude to determine means through which targets could be achieved varied according to the nature of the target itself, and the level within the organisation at which the process was occurring. The perception was that below the level of middle management freedom to determine means was limited:

“He (the Engineering Manger) looks at the things people are doing currently. He comes up with this (Engineering Activity Plan), this is his idea. He will ask us if we are happy with it, or have any concerns, and then expect us to come up with targets and means for implementation for each individual section. So then you may subdivide further down. Once we have had time to analyse it then we come together as a group and negotiate within that, so you do have change, but he comes up with the initial ideas.” (Engineer)

At this level of the organisation targets and means were more prescriptive, and, as such, the discussion at meetings centred more upon implementation plans. The targets themselves remained open to change, and the meetings provided a valuable forum for negotiation of support from peers:

“What we did as a group, we would all come back with our individual tasks with a timing schedule, and then you would say whether you agreed with the initial outline targets or whether you felt that they needed to be moved. You might be able to get certain commitments from the rest of the group..... So the initial targets are more global for the year and then you break them down.” (Engineer)

The value of participation in the establishment of target and means derived from tapping in to the knowledge of those closest to the process:

“..to meet management policy these are my tasks. My manager set the major tasks for me, but I knew that we did not have the necessary hardware to achieve that objective. I knew I had to develop what we had, and I had to go through with him and explain that based upon what we had we could not do this in the available time; he agreed with me.”

(Section Manager)

INTEGRATION

The outcome of this stage of the process is the integration of targets and means which translated from annual policy with daily work. At NYEL this was the stage when implementation of plans occurred, and this part of the process was less clearly defined and more difficult to identify as there was no uniformly accepted way of working across the organisation. Objectives categorised according to QCDMS were seen as central to this stage:

“We manage through objectives in the day-to-day QCDMS. You need initiatives, plans and resources to achieve that..” (Production Manager)

Objective ownership indicated clear lines of accountability and was linked to individual appraisal, although forming only one small part of the overall measure, and financial rewards were small. Individual performance was discussed at individual quarterly reviews with next line managers, and at the annual appraisal:

“I will be following up specific projects to ensure that what has been agreed with my staff has been achieved. If this is not the case then the reasons for non-achievement will be discussed. It could be that other factors influenced this project and resulted in an adjustment in terms of time for achievement of target. If it is simply that he ‘forgot’,

then this will be brought up at his appraisal as this is one of the measurements for responsiveness or workload.” (Engineering Manager)

REVIEW

The review stage of the process was systematic and continuous as can be seen in figure 7.7 on the following page. The figure illustrates the way in which the review process was seen to continuously inform the implementation stage thus allowing appropriate corrective action. Reviews which occurred less frequently rolled up the organisation informing mid-term and annual policy.

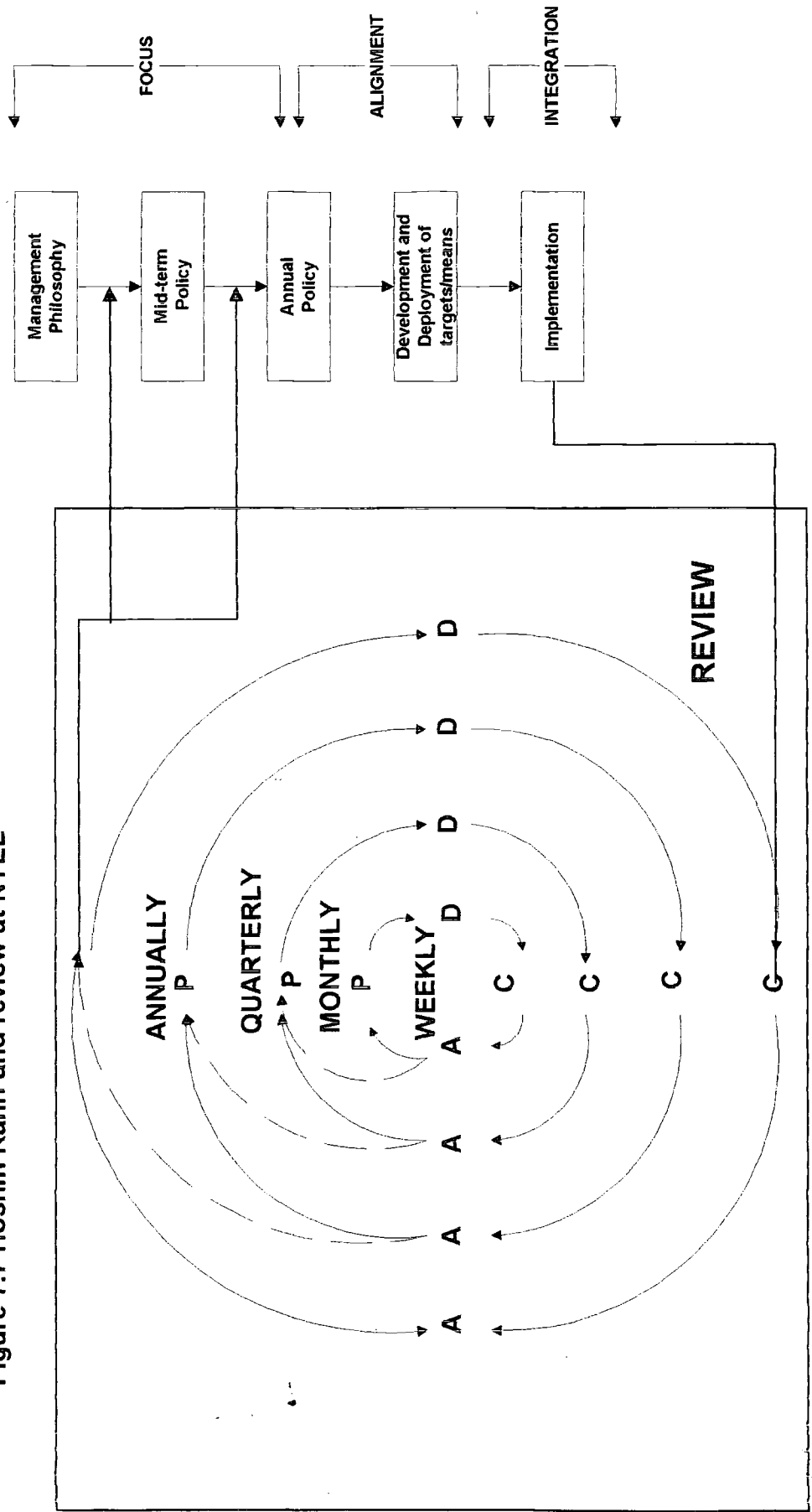
The importance of the review stage of the process was that it ensured that organisational priorities were managed in such a way that they were not crowded out by the expediency of short term pressures. Any alteration to the order of priorities was a managed process:

“Well one of the prime objectives this year is launching the new car and we are into the last trial and then into production. If next month we had some major problems in achieving quality we will stop everything and focus upon that (launch of the new car)- that is our prime objective.” (General Manager)

The monthly strategy meeting consisted of a presentation by individual managers which facilitated a process of continuous learning from experiences gained through the previous period. These meetings were generally seen as:

“..an opportunity to talk and review progress and discuss what has been achieved - perhaps there may be some new ideas that people have come up with that have not been considered.” (General Manager)

Figure 7.7 Hoshin Kanri and review at NYEL



There was a question as to the extent to which the review process resulted in an alteration to targets if problems were highlighted. It was general practice that the targets themselves would not be altered, but

“in terms of trying to change things round to achieve the objective. It may be the end date changes, do we need to spend more money? put more manpower in?” (Production Manager)

Summary

First used by NYEL in 1993 Hoshin Kanri was seen by senior management as a tool for managing the whole business, enabling the organisation to see its status at any one point in time. It was perceived to provide a link between targets, annual objectives and the organisational vision, and provided the means for creating and managing continuing radical change. The performance measures based upon TQC provided a common language which facilitated organisational communication.

Focus was provided through the mid-term policy from which annual policy was derived, and a three year challenge was used as a vehicle to manage this over time. This closely replicated practice at the major customer NMUK, and the close relationship between the two companies raised the issue of the degree to which NYEL had freedom in determining the strategic direction for the company.

Annual policy was used to indicate to the rest of the organisation the company's priority for that year. Importance was seen to rest not in providing an in-depth understanding of top level objectives, but in making individual work meaningful.

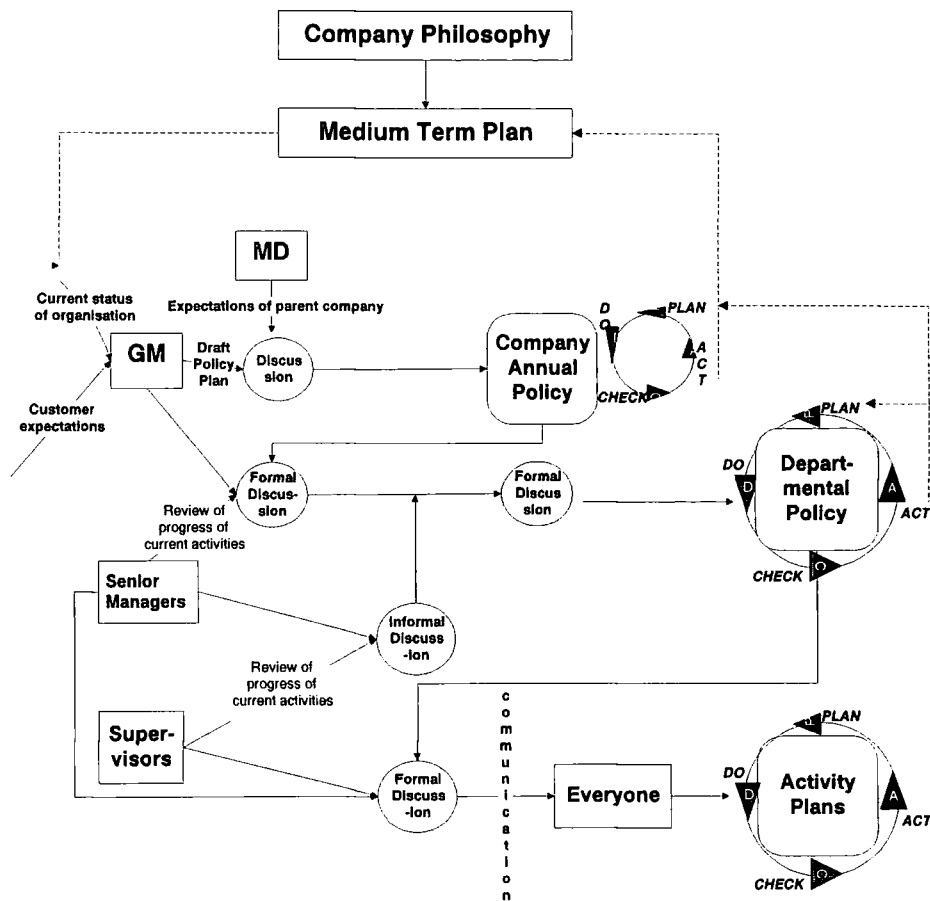
The senior management were involved in the establishment of targets based around QCDMS at a much lower level than would have been expected, perhaps reflecting the absence of discrete structures for the establishment of functional policies. The absence of organisational arrangements for cross-functional management highlights an area for exploration in the studies that follow as the way in which associated targets and means were established and managed remains unclear.

Establishment of targets and means at the top of the organisation was found to be participative and was achieved through two way formal and informal communication processes. There was a question as to the degree to which individuals at lower organisational levels had the same latitude in the determination of targets and means. The issue arises as to the extent to which this was determined by the nature of the objective, and will be explored through the following studies.

The integration stage of the process was found to be less clearly defined and more difficult to identify than the alignment stage, and this requires further clarification. The effect of the system of performance appraisal upon this stage of the process also requires further clarification.

This chapter has presented the model of Hoshin Kanri presented by NYEL, and the process suggested from the research is outlined in figure 7.8 below:

Figure 7.8 A revised Hoshin Kanri model at NYEL



The figure shows the degree of involvement of organisational actors in the process as outlined in figure 7.6. Additionally the review cycles which are turning continuously (shown in figure 7.7) are incorporated. Whilst this model is more complex than that presented in figure 7.2, it provides a clearer exposition of the Hoshin Kanri process at NYEL.

The studies presented in the following chapters will seek to develop knowledge of the process as presented here, leading to a fuller discussion of the issues which arise in Chapters Ten and Eleven of this thesis.

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CHAPTER EIGHT:**STUDY ONE: THE SPOT WELD IMPROVEMENT OBJECTIVE****Introduction**

In order to gain further insight into the Hoshin Kanri process this study follows progress of the improvement of the spot weld process as part of annual policy. This study provides an example of a key operational process which, while subject to incremental improvement through daily management, became the focus for a need for major improvement.

This was the first time that the company had taken a cross-functional approach to managing such an improvement. Spot welding was a key organisational process, where following the pressing of parts from steel coils, those that formed part of a subassembly were subject to a welding process; 430 million spot welds were applied each year.

FOCUS**The spot welding process as part of annual policy**

The rationale for the identification of the spot welding process as an area where major improvement was necessary is unclear. According to the General Manager, focus upon the spot welding process arose as a result of the collection and analysis of data throughout the organisation to highlight those daily management activities which would help the organisation achieve the

customer orientated objectives which translated as a result of BG'96. Analysis of information across the company led to the identification of a number of issues which gave opportunity for major improvements, and which would yield benefits in terms of customer satisfaction and costs.

Other organisational actors suggested that the spot welding process had been highlighted because of a specific problem experienced by the major customer. The result of this was the imposition by the customer of a series of checks to prove the welding process, this resulted in an increase in costs associated with scrap. Proving the process required the testing of a specified number of assemblies in such a way that the part was 'torn down', this meant that the assembled parts were separated in such a way that the assembly was no longer fit for purpose and hence had to be scrapped.

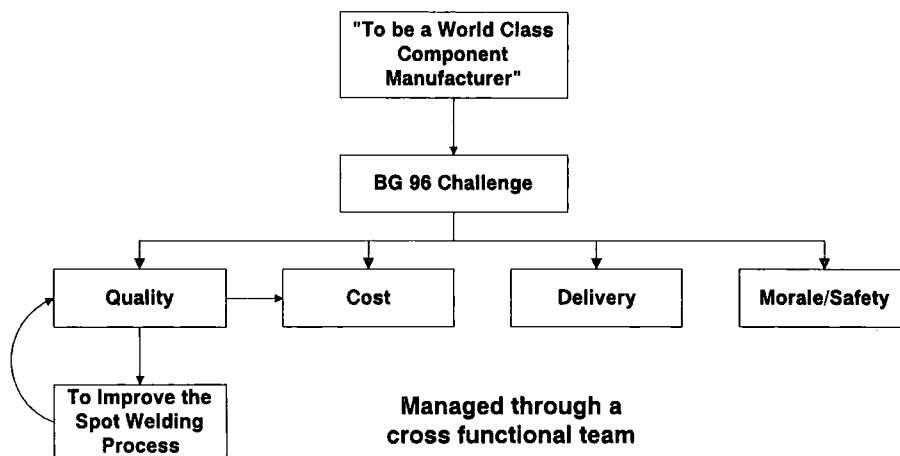
The rationale was thus two-pronged, improvement of the process would ensure customer satisfaction and reduce the required frequency for testing, this would reduce scrap and hence costs. From this perspective the activity which resulted was a reaction to an identified concern rather than the identification of areas for improvement through an analytical process.

Translation from policy

The translation of policy and flow of activities can be seen in figure 8.1 below. The vision of the organisation "To be a world class component supplier", was translated into the BG'96 challenge which was further

translated in terms of QCDMS. Analysis of issues pertaining to quality and cost identified the spot welding process as an area for focus which resulted in the translation of the specific "Spot weld improvement".

Figure 8.1 The spot weld improvement as part of annual policy



The spot weld improvement objective was only one initiative which was ongoing within the organisation over the period of the research, other objectives were translated from BG'96 and were categorised according to QCDMS as shown above.

The life of the spot weld improvement

The life of the spot weld improvement can be seen in figure 8.2 on the following pages. The identification of the spot weld process as an area requiring major improvement occurred towards the end of Year 0, and was carried forward into policy for the following year. Ownership of the objective

was agreed and a cross-functional group was formed. The objective was further translated, and the means associated with the targets were implemented, and progress towards objective achievement reviewed on a regular basis.

At the end of Year 1 following an annual review of the whole organisation the objective was carried through to Year 2, and the cycle repeated itself. At the end of Year 2 the objective was no longer a focus for major improvement and became subject to the processes of daily management.

Figure 8.2 The life of the spot weld improvement

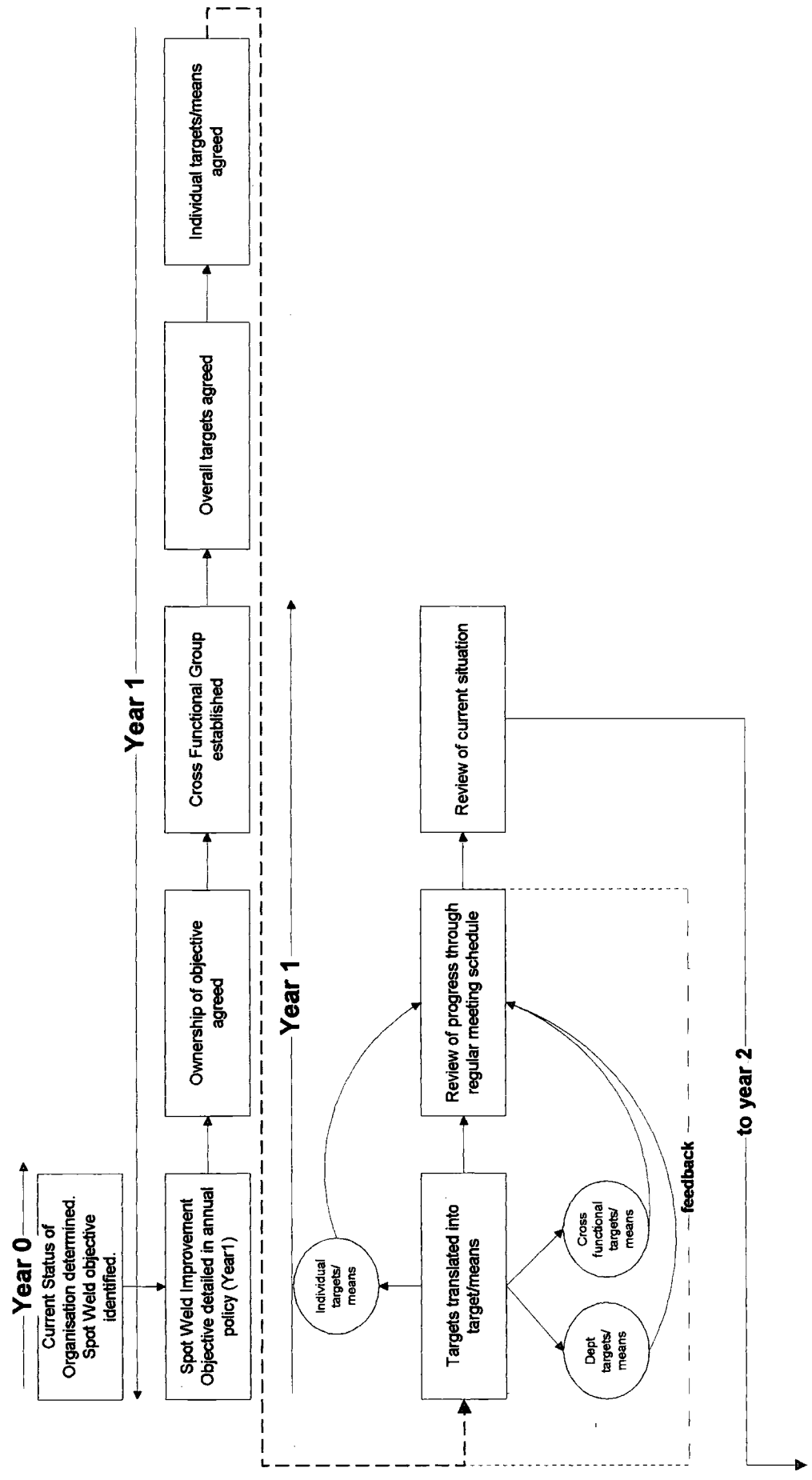
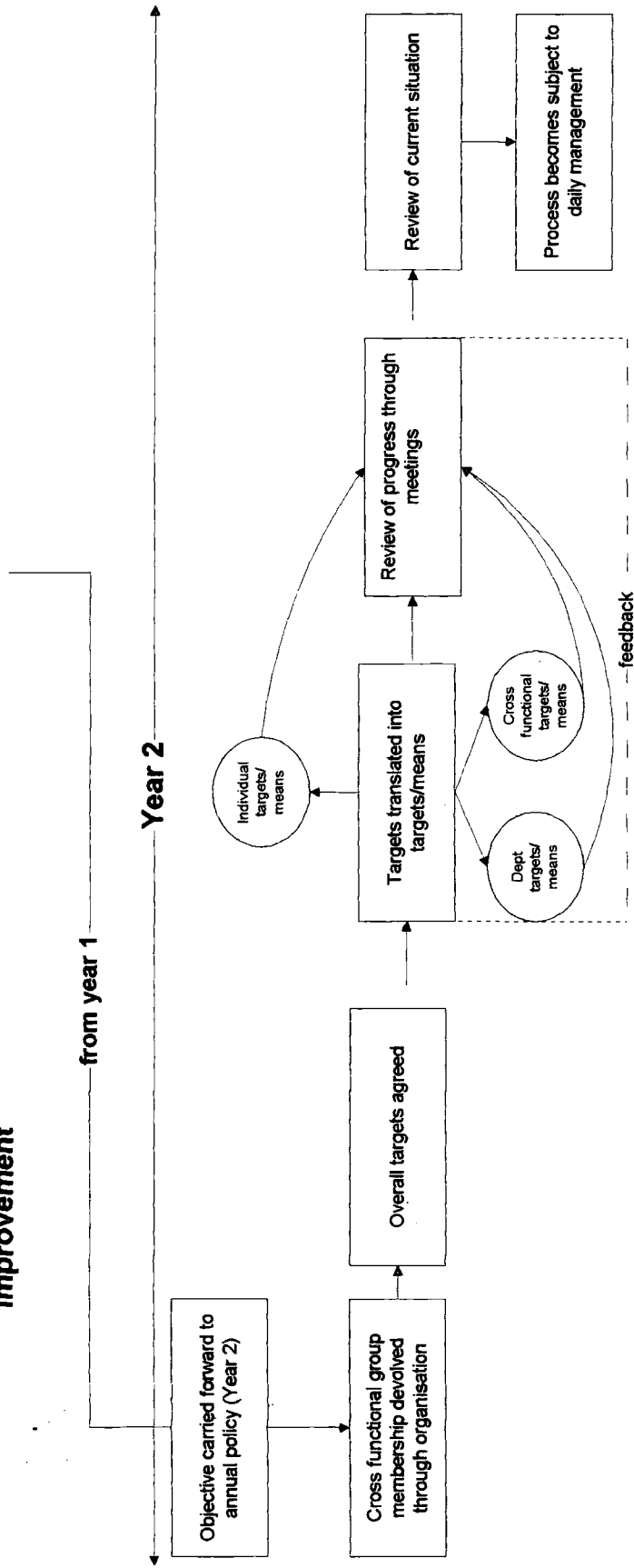


Figure 8.2 The life of the spot weld improvement



Prioritisation

An important outcome of this stage of Hoshin Kanri is that it focuses the organisation upon the priority for action, and provides a context within which individuals understand their own work in light of this priority. Given the importance of spot welding in the production process and the volume of weld applied each year there were a large number of employees who were touched by this improvement.

Signalling priority through policy should enable an individual to situate the importance of the contribution of their work. The research suggested that the level of awareness that the spot welding process was a focus for major improvement brought about results in the first year:

“Over a period of time the benefits came through ... everything that everybody contributed into this had a knock-on effect, and basically an overall awareness was given to everybody and I think that had a big effect on the overall result.” (Team member)

The degree to which this level of awareness was maintained was open to question when in the second year a quality technician, asked to support the objective by becoming a team member, suggested that he had been unaware of the existence of the cross-functional team until asked to participate as a team member.

The level of awareness of this objective as a priority in daily work for those involved in the process at an operational level was also questioned by the same team member. In fulfilling his role as quality technician, responding to concerns identified on the shop floor by operators in the process of their daily work, he had become aware that a large number of internal concerns were not being reported. In order to speed the process, team leaders were instructing operators to re-weld where weld failure had occurred, rather than go through the standardised procedure. As a result he argued both the targets established in Year 2 which were based upon Year 1 results, and the actual results achieved were not a true reflection of process improvement. This suggested that the level of awareness of this objective as a priority had fallen over the life of the improvement.

The research found that the priority accorded by the individual was affected by the priority communicated by senior people in the organisation:

“Well others may take that as a priority, but because the production manager does not see this as a big problem - he wants production up to full volume that is his problem” (Engineer),

and further

“...it is a priority of management rather than at a section manager level where if he has a couple of spot weld occurrences a month he can live with it. Of course he wants them out of the way, but unless they are priorities he has stressed to me personally that this is not his priority because he has production problems, but that is him as production.” (Engineer)

ALIGNMENT**Objective ownership**

The spot weld process as part of the production process was managed by the Production Manager. In the translation of specific objectives from annual policy the Engineering Manager agreed to take ownership of the improvement; which was of significance for management of the objective because he did not manage the process:

“I think that engineering should have ownership of that one... If I could prove to maintenance that it is not an engineering concern, and that it can run with sufficient knowledge then it is their problem. We have never proved that the process is capable so that is definitely an engineering concern.” (Engineer)

A cross-functional approach

As objective owner the Engineering Manager was tasked with investigating the process and proposing suitable courses of action. His response to this was to seek the co-operation of other managers to establish a cross-functional multi-level team. The role of the Engineering Manager as objective owner within a cross-functional context was one of facilitation and co-ordination; acting as the hub to the spokes of a wheel.

As has already been stated this was the first time that the organisation had attempted to drive a major improvement cross-functionally, and the rationale for this remains unclear. There were no predetermined structures within the organisation such as functional committees as has been outlined in the

literature in the previous chapters. The way in which this was managed appears to correspond to the view of Kano (1983) when drawing a distinction between the Western approach to cross-functional target deployment and the Japanese approach; that approach adopted here corresponds closely to the Japanese approach as Kano describes it.

The Engineering Manager viewed the established team as a department for which he had ultimate responsibility:

“Departmentally when it comes to this objective, I see that as my department, and they are my team and the fact that I am not their manager does not seem to bother any of us....the departmental links - there are no borderlines, it is a grey area.”

The cross-functional approach engendered a shared feeling of responsibility between the management team:

“We have a plan and the assembly manager has a matrix, he has staff which are involved in this project. If I have failed in this project then he has failed”
(Engineering Manager),

and resulted in the ability to draw upon multiple perspectives and skills when approaching the process:

“... we are all looking at it (the project) from different angles - we do not just say well it is a material handling problem let's get material handling down, we get everybody involved.” (Engineering Manager)

In Year 1 membership of the team comprised all Production Section Managers, a Quality Section Manager, the Section Manager in charge of Maintenance and several engineers who were identified as having special knowledge of the welding process. Membership of the team as well as being cross-functional was multi-level, and changed over the life of the research; individual participation was determined by departmental line managers. The initial grouping did not go down below section manager and attendance at meetings was floating because of the operation of the shift system.

Membership of the team changed as the project was carried on to a new planning year. Production Section managers shared the view that once the project was running smoothly there was an opportunity to devolve responsibility; there was recognition of the potential for contribution at Team Leader and Operator level. The further devolution of targets and means through membership of the group was seen as a means through which development of individuals could be achieved, increasing motivation and job satisfaction. In practice this was not carried through because limited manpower made it impossible to allow time for operators to attend meetings; instead two production section managers were designated responsibility to support the objective.

The Quality Manager devolved responsibility for supporting the objective to a Section Manager who in turn devolved this to a Quality Technician. This possibly reflected a difference between departments in the development and

understanding of the Hoshin Kanri process. The engineers who supported the objective changed through the life of the objective as a result of the re-organisation as discussed in Chapter Six; those asked to support the objective had special expertise relating to this project which was perceived to be of value.

Meetings of the team were scheduled on a monthly basis, and membership and management of the group was perceived as important in facilitating full participation in informing the improvement process:

“It is experience and having the right people and the right format so that people can express their opinions, and the person co-ordinating the meeting being able to recognise that, and not just listen say to engineering because they think that they have all of the right answers; you might find that actually one of the lads on the shop floor might have a good idea and you can bring all of these things out.” (Engineering Manager)

In practice however the appointment of the new team members in Year 2 created difficulties for some of the individuals concerned, particularly those at lower organisational levels who felt that they had been inadequately briefed about the history of the project, and their role in the group:

“... I went in totally blind and for a while I was totally awe-struck. The first bit of paper that I was actually given were the minutes of the previous meeting. I was trying to listen to what he (the engineering manager) was saying and read ahead.” (Team member)

The establishment of targets/means

The regular cycle of meetings were used as a forum to generate ideas for action, agree support and review progress of previous activities undertaken. At the first meeting held, the Engineering Manager outlined the background to the decision to focus upon the spot welding process, and presented data to justify the initial numerical targets that he had established.

Targets were expressed in terms of internal and external concerns. The number of internal concerns represented the number of spot welds identified as not conforming to standards through the application of the quality checks by the operators on the cells who managed their own process. On discovering an internal concern the operator in charge of the process would notify the relevant member of the quality department, who would raise a non-conformance report (NCR), which would be used to analyse the reason for the process failure to allow corrective action to be taken. This was the application of the PDCA cycle on a continuous basis at the operational level of the organisation. The number of external concerns was the number of parts identified as not conforming to specification as identified by the external customer.

There was discussion regarding the level at which the targets had been set, and the means through which they could be achieved. One of the first tasks was to establish a process through which reliable information could be gathered so an accurate picture of the situation could be gained. As part of the process of

monitoring quality, information was gathered regarding the number of reported concerns, however there was some doubt as to whether all concerns were actually being reported. This was subsequently borne out in Year 1 when, through a process of communication with shop floor operatives regarding the importance of raising the correct paperwork associated with internal spot weld failure, there was a significant increase in the number of internal concerns reported. This indicates the importance of communicating the priority of top level objectives to the whole organisation.

When the objective relating to the spot welding process was first established, the level of information gathered through the NCR (which categorised the nature of the problems experienced) proved inadequate. This impacted upon target/mean setting as it proved difficult to determine data-based means through which targets could be achieved given the quality of the available information. The lack of relevant information became the focus for action for one of the engineers within the team who took ownership of a target to improve data collection through a process of investigation.

The view generally was that in the establishment of targets/means there was discussion within the team:

“Initially targets were set too high and had to be readjusted because we could not achieve those targets; it is not the point to go for unrealistic targets it is better to aim for a target that is achievable so that you can get some gain and satisfaction from it.” (Engineering Manager)

This is contrary to the view expressed by Nemoto (1983) in Chapter Two regarding the importance of establishing targets based upon necessity rather than achievability.

In the second year of the improvement the targets were negotiated not only within the group, but across the departments. In establishing the targets for Year 2 the Engineering Manager had taken into account the impact of the introduction and the launch of the new model. The Quality Manager did not consider that this was acceptable and negotiated a change to the targets because they did not represent an overall improvement, and were not therefore supporting the organisation's overall quality objectives. The targets in Year 2 reflected the improvement in the quality and reliability of the data.

The overall target was further translated into targets/means. This involved establishing not only a result to aim for, expressed either numerically or as a time line for completion, but the means by which this was to be achieved. For example "to write a manual of the spot welding process, through the detailed measurement of the optimum weld conditions for each weld applied, to be completed by the end of October."

Analysis by the team of existing information available highlighted those cells within the production process which were experiencing the greatest number of internal concerns. The Non-Conformance Report (NCR) raised by the quality department following a reported concern identified the part, the cell which

had produced the part and the nature of the problem, and these were collated via a computer program.

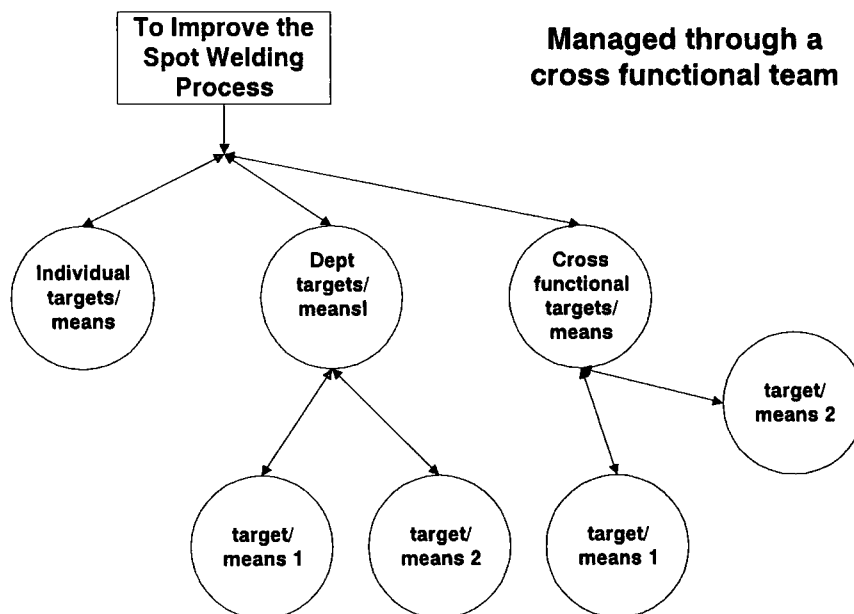
An analysis of potential factors which had contributed to the concern on each of the highlighted cells was then carried out based upon the application of the '4 Ms': Machine, Material, Method and Man. This was a framework used by the team to categorise the information gathered from the NCRs, and was used in conjunction with a fishbone diagram. Under each categorisation the team examined factors which were contributing to concerns, and from those factors examined those parts of the process where there was the greatest potential for improvement. For example, within the machine categorisation the available information from the NCR's identified a need to review the replacement of consumable parts. This was then taken as a target by the maintenance section manager whose area of responsibility this fell within. This provides an example of the close interlinking of the targets and means which translated from the spot weld improvement objective through the working of the cross-functional team.

Some of the improvements identified were specific to an individual cell, others had general applicability. Those with general applicability had the potential to produce the greatest benefits, such as the replacement of consumable parts as noted above, and were thus according to the Paretian principle given priority. This indicates that prioritisation was occurring at each level of the target/mean setting process. The nature of the activities

undertaken were very much production-led, and generally arose from concerns experienced upon the shop floor through quality meetings. In this sense identifying the means through which the target was achieved was a reactive process.

Each member of the team was responsible for a target which related to their particular area of responsibility. Dependent upon the nature of the target there were a number of alternative courses of action required, and these are shown in figure 8.3. This corresponds to targets and means translation as shown in figure 8.2.

Figure 8.3 Translation of targets and means



The figure shows that this objective was further translated into targets and means by the cross-functional team and identifies three different routes for activity. The first is where a team member agreed to take ownership of a

target which was within their own scope of responsibility to achieve; the means associated with the target thus remain with the individual. For example one member of the group owned a target to test a new piece of equipment that allowed non-destructive testing of the integrity of spot welds.

The second required that the individual who owned the target sought co-operation from within the department in determining the means to achieve it; this in some cases involved the translation of further targets and means. For example, the establishment and implementation of a training programme for maintenance technicians relating to the spot welding process.

The third required co-operation of a cross-functional nature in determining the means to achieve the target, and could also require the translation of further targets and means. An example of this was a team which was established by one of the engineers to analyse and improve the spot weld process on two specific cells which were presenting a higher than average number of concerns. The membership of this team included engineers, maintenance engineers, the cell operator and a member of staff from the quality department. The team managed this target as a TQC theme. The two way arrows indicate the application of a systematic review process.

The research suggested that the role of the cross-functional team was to prioritise and align activities at an operational level which would ensure integration into daily work. There were several examples where individual

members of the team followed through particular issues raised within the meetings by investigating the feasibility of a particular course of action based upon their own knowledge. This examination was carried out outside of the management of the team, and having carried out an informal feasibility study the issue was then raised within the forum of the monthly meeting.

This suggests that within this cross-functional way of working two types of improvement were integrated at this level, a bottom up improvement as described above, and a top down improvement where ownership of targets and means were agreed within the group. The bottom up improvements were systematically incorporated to ensure co-ordination and control of activities. Following from this there were implications for team membership and management. Advantage was gained from a broad spread of knowledge and expertise and an encouragement of individuals to contribute their own solutions.

Agreement regarding ownership of targets tended to be determined by the expertise of the individual members of the team; one example of this was that of the engineer who agreed to take ownership of a target to construct a manual which detailed the optimum weld conditions for each spot weld that was applied, and provide new standards for the process. This required a cross-functional approach necessitating the enrolment of support from other engineers and production staff. Where necessary, outside agencies were

contacted when special expertise was required (as in the case of British Steel and a local university).

The research found that in translating targets/means there was an openness to consider alternative suggestions and courses of action:

“...we put input in to say what we needed to do. The initial meetings were to do with the collation of information and the setting of targets and then it was a case of how can we achieve that, what areas can we look at, what can we do in certain areas to improve that, what are the aims short term and long term.”

(Team member),

and there was discussion over priorities:

“..if he (the engineering manager) said we are going to do this, then we could say that that was not practical, and we should take other actions first from which there would be more gain.” (Engineer)

The research suggested that the degree of freedom in determining actions which would contribute to the improvement was limited by the nature of the process itself; spot welding demanded adherence to a standardised process determined by the optimum weld conditions. Major change, however, required doing things differently and, despite the constraints that the process itself imposed, there was still room to do this through analysis of how the process was organised and managed while still maintaining necessary conditions for spot welding.

One example of this was the improvement which was implemented on the two cells which were to be the focus of a TQC theme which resulted in major improvement, reducing the number of concerns to zero. The improvement involved combining the spot welding process for two parts which were mirror images of each other in such a way that they utilised the same equipment. This resulted in the reduction in the amount of scrap, and hence costs, as the number of tear downs which formed part of the quality control process were halved at the end of each shift.

This example also illustrates the way in which the cross-functional team incorporated ideas for improvement which came from the shop floor. The idea had originated with the operator on the cell:

“The section managers and team leaders do ask the lads for ideas on specific problems, we do have good communication between the section managers within production and the lads on the shop floor.” (Engineer)

INTEGRATION

Because the Engineering Manager owned the objective the paperwork relating to the activities remained with the engineering department. Ownership of individual targets/means was simply noted within the appropriate department's activity plans. The responsibilities which ensued for individuals as a result of membership of the team were managed alongside any other targets for which they had responsibility, plus their day-to-day work; this was not a dedicated improvement team.

The research found that there was no uniform approach to the way in which individuals worked towards the achievement of their target. Supporting activity plans were raised which were used to manage progress:

“ I would put into place some form of schedule or structure, I would then within the remit of my job include other people who I need support from. A lot of the time you need the support of other departments.... ” (Team member)

The priority accorded to the objective by team members in daily work was influenced by the way in which the meeting schedule was adhered to, and the efficiency of communication between the team. The introduction of the new model and the demand conditions for the existing models contributed to a cancellation of meetings in Year 2, which impacted upon interpretation of the objective's importance:

“I had a concern at the time at the turn of the year that it had become a flavour of the month, but coming into the new year the new model had tailed a bit and we had started to get things under control. It was obvious that we needed to hold meetings again and the Engineering Manager had picked up on it. I think that because the meetings had picked up it has injected a bit more interest from individuals. ” (Team member)

REVIEW

Progress towards achievement of individual targets was reviewed at the monthly meetings of the team when priorities were re-examined and where necessary corrective actions and timelines were agreed. Minutes of the

meetings were used at a departmental level to monitor progress toward individual objective achievement.

The progress made in implementing those activities which translated from the spot weld improvement varied throughout the research period. Throughout the first year the spot weld meetings were held according to schedule with the exception of two months where pressure of other activities necessitated their cancellation; when this occurred information was circulated to team members.

At the end of the first year, although no meetings had been held from October, targets had been exceeded:

"We have had a big improvement... Although it has been noted that over a period of time with current working conditions and pressures the input is not getting put into it that was first envisaged as a work practice, but that has not fallen by the wayside it is purely other pressures which exist at the moment. That will be readjusted as time goes by." (Engineering Manager),

and this improvement was maintained over the life of the project:

"We went through a sweep of all the major cells highlighting indicative problems. It was beneficial and we started to see the benefits straight away. We saw a great improvement by the end of Year 1, we had exceeded our targets. Year 2 we are following the same sort of strategy, however there are more teams involved now, it is not jut the core team we started off with, it was not feasible." (Quality Manager)

The objective remained the focus for further improvement within the next year's annual policy, however there was recognition that the prime annual objective for the organisation was the launch of the new model. As the deadline for start of production approached, activities towards this overtook other events. One example of this was the target owned by the Maintenance Section Manager to develop a training programme in the first instance for maintenance technicians which was then to be rolled out across Production Section Managers:

"We were trying to have a training programme there but we have had to put it back while we have concentrated on getting the new model out, but the packages are still there." (Maintenance Section Manager)

In Year 2 the first meeting to be held was in March. The reconvening of meetings followed an increase in concerns mainly internal to the organisation, although several external concerns had occurred which had taken the results above target. Following that meeting only two of the scheduled meetings were held throughout that year, although it was argued that activity was still ongoing and results were being reported and circulated.

The general view was that the pressure of work involved in successfully launching the new model was the reason why meetings were not held; this was the vital priority for the organisation. While actions agreed in previous meetings were reportedly going on in the background, and results published and circulated on a monthly basis, no new activities were discussed or

undertaken. Any 'slippages' were not rectified, review had become a static process. At the end of that year it was decided that the improvement of this process was no longer to be a focus for annual policy; improvements had been made and organisational priorities had changed.

Results

At the end of Year 2 the results were such that it was no longer considered necessary to focus upon this objective as part of annual policy. There was a 30% annual improvement in the number of internal concerns, with 59% of all cells having had zero concerns. On a monthly basis the results were below Year 1 actual results on 8 occasions, and by December of that year the number of concerns were below 10. (This within the context of the application of 40million welds per month). External concerns did not reflect this picture with an increase in the number of concerns over all. The majority of these were seen as one-off concerns which were the result of the pressure of the introduction and launch of the new model. By the end of Year 2 the number of concerns had fallen month by month and by December this figure was zero.

Summary

The spot weld improvement objective was of particular interest because it provided an example of a key operational process which was to be subject to major improvement and this was the first time that the company had used a cross-functional approach in the management of such an objective.

The awareness that this objective was a priority and a focus for major improvement varied over the life of the research, which raised the issue of how organisational awareness could be maintained. One influencing factor was the way in which priority was signalled by senior managers, and for team members this was measured by the management of meetings and associated activities. The importance of maintaining organisational awareness was evident in the way in which individuals closest to the process reacted when problems arose.

The absence of organisational structures for cross-functional management was noted in the previous chapter, and this objective provided useful insights into the way such management was approached. The objective was managed through the formation of a cross-functional multi-level team the activities of which were co-ordinated by the objective owner.

The suggestion that the development of Hoshin Kanri differed across the organisation was highlighted by the difference across the departments in the way in which team membership was devolved in its second year.

Targets were agreed within the group and were perceived as achievable. Deployment to lower levels of the organisation was limited as freedom to choose between alternative courses of action was restricted by the operational bias of the objective. The way in which means were determined was reactive and production led in that they were based upon problem identification.

The operation of daily management was evident in the application of the PDCA cycle at an operational level, and through the use of TQC tools in the analysis of information and the determination of courses of action.

The study provided insight into the integration stage of Hoshin Kanri through an identification of the ways in which targets and means could be delineated as they were translated through the cross-functional team. There was no identified uniform approach to the way in which individuals worked towards targets. Priority given in daily work was dependent upon maintaining a level of organisational awareness as already noted. The role of the cross-functional team was to prioritise and align activities at an operational level in a way which ensured integration into daily work. This also highlighted the importance of the close interlinking of target and means if alignment of organisational action was to result.

The results achieved through the life of the objective represented major change through significant improvements. Throughout the time of the research

the objective was reprioritised in the light of new model introductions and this was not well understood

This chapter has outlined the progress of the spot weld improvement objective using the FAIR model developed in Chapter Four. The operational nature of the spot weld improvement, and the cross-functional approach to its management highlighted a number of significant issues for the FAIR model which will be subject to further discussion in Chapter Ten of this thesis.

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**CHAPTER NINE:
STUDY TWO : SHOP FLOOR RECONFIGURATION**

Introduction

In April 1997 the management of NMUK announced that the new Almera, a third car, would be produced at the Sunderland plant, and launched in the year 2000. At this time NMUK Sunderland operations were producing variants of the Micra and Primera cars. This announcement had major implications for NYEL as the organisation would need to support the production of a third car alongside existing production and, following the public announcement, NYEL acted to introduce objectives to support this into mid-term policy. Production of a third car had been discussed as a possible scenario by the management of NYEL since the beginning of 1996; given the sensitivity of this strategy it was not possible to make this public knowledge.

This objective related to the way in which the shopfloor layout was altered as a step towards accommodating production of the new car, and is a key example of how strategy within NYEL was customer and new model driven. Interest in the objective rests in the potential complexity of activities associated with its achievement as it encompassed all areas of the production operation. This chapter will follow the unfolding of the activities associated with the objective as it translated from policy, using the FAIR model as discussed in Chapter Four.

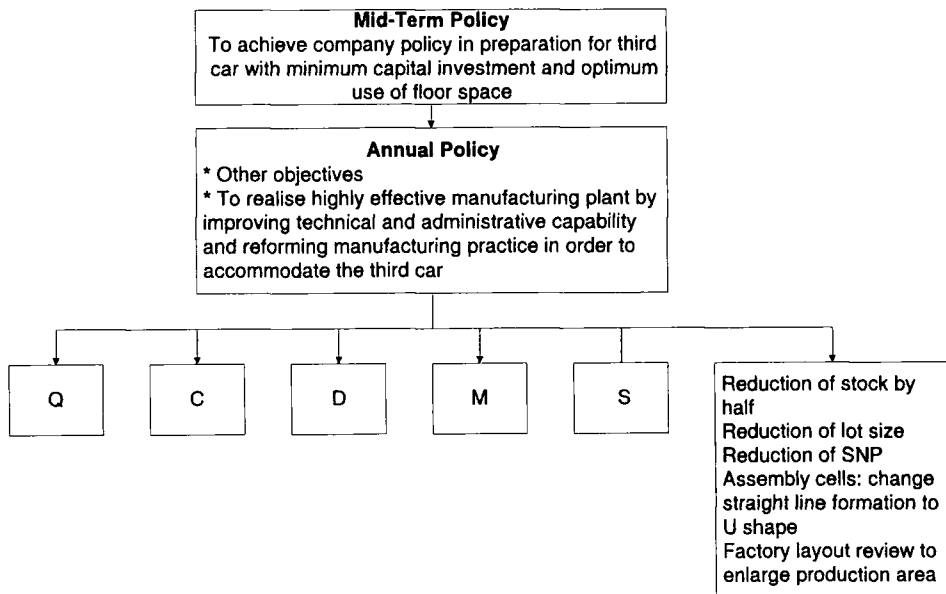
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Annual Policy

As NYEL had already formulated and published policy for the year an amendment to this was made, and a mid-term policy to prepare to accommodate production of the third car with minimum capital investment and optimum use of floor space was incorporated into existing policy. This was translated as an annual policy which required that the organisation examine the efficiency and effectiveness of current production practice.

This policy encompassed the need to create space for the production of a variant of the Primera - the estate, and the facelift for the Micra. The production of these models was part of existing policy and had been planned for the beginning of 1998. The objectives which translated from policy can be seen at the far right of figure 9.1 below.

Figure 9.1 Reconfiguration of the shop floor as translated from mid-term policy



The objectives which translated from the new mid-term policy were managed alongside those objectives which translated according to QCDMS categories as shown ; in effect

some of them could be seen to contribute to these, for example productivity gains would impact upon cost.

The objectives were interlinked. The reduction of lot size required an improvement in efficiency in the pressing operation, which required a reduction in the die set-up time and an increase in the strokes per minute (SPM). The SPM was a measure of the efficiency of the Press denoting the number of strokes and hence the number of parts that could be pressed each minute. The die was a template which gave the part shape, and taken together the two determined the size of the lot for that part from that particular machine:

“Die set-up time determines the minimum lot size because you would never let a Press go down. So if it takes forty minutes to set up a die, the minimum lot size would be forty minutes running at say 10SPM, the minimum lot size is 400. If they can reduce die set- up time they can reduce lot size.” (Engineer)

Changing the shape of the cell layout within the assembly operation was linked to a more efficient use of resources with particular impact upon movement of materials around the shopfloor:

“One of the biggest problems that we have got is the amount of material we are moving about given the number of deliveries that we are making every day. Here (furthest from the despatch area) we may have a cell that has a standard number of parts (SNP) of 45, but it is a common part and NMUK may use 450 a day; that is 10 movements of finished goods. But we may have a cell up here (close to despatch) with a SNP of 400 and we

are moving that once a day. The whole change around is to do with becoming lean and reducing movements.” (Production Manager)

Standard number of parts (SNP) denoted the number of each part in a storage container. The larger the part the fewer that would fit in a container and vice versa. The number of material handling movements was determined by the frequency of use of a particular part in the assembly of the final product at the customer.

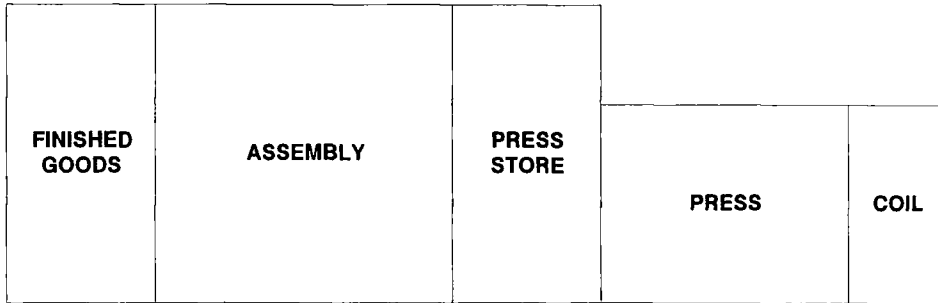
Scale of the change

The annual objective represented major change:

“We put a stake in the ground and said we would not have work in progress stock which is radical to say the least, we are pretty lean, we have only four days stock in the Press Store, which for the industry is very good. We have taken the next step and said we will eliminate this. The offshoots from that are enormous, the material handling aspects, the logistics aspects, we have even encompassed more objectives. We haven’t just said we will relay the shop floor - this has got to have a purpose. We could have stayed at the status quo, we could if we had further business just build an extension, if we didn’t want to improve.” (Production General Manager)

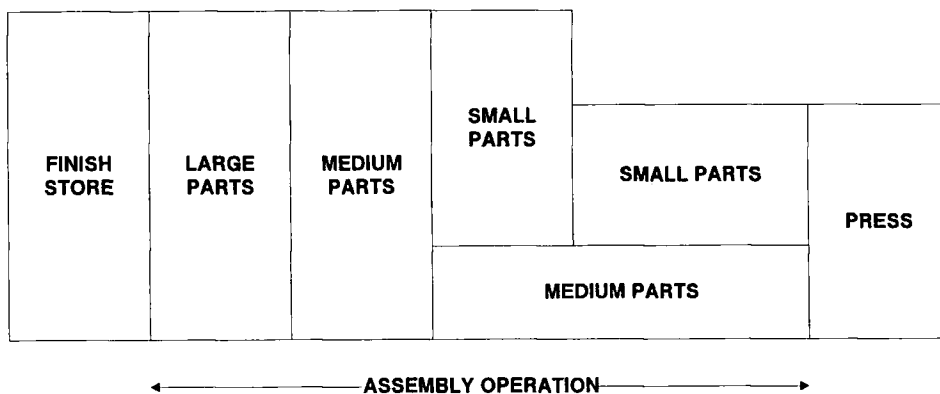
The layout of the shop floor prior to any changes can be seen in figure 9.2 below. Steel coil was stored at one end of the factory from where it was transferred to the pressing operation. Parts were pressed which were then transferred either into a Press Store, or finished goods area. Those in the Press Store required an assembly process and were moved into the Assembly operation and then into the finished goods area.

Figure 9.2 Shopfloor layout prior to change



To achieve the overall objective, part of the plan was to eliminate the Press Store and move parts from Press directly to the cells which required them; this necessitated a change in the factory layout. Initial plans intended to eliminate the Press Store completely, however it was later decided that this was not possible at this time, and so a small extension to the factory was built to 'square off' the 'L', this new part of the factory was to be used as a much reduced Press Store. The flow of parts through the factory was examined and the optimum layout was considered to be that in figure 9.3 below.

Figure 9.3 Shopfloor layout post change



In making the decision to reconfigure the factory layout to optimise the use of space other factors were considered. The Pressing area was taken as given, the cost of relocating Presses was high because of the infrastructure required below ground level. A more efficient use of space was proposed which involved relocating cells in the assembly area according to the SNP, to minimise material handling.

The assembly arrangement up to that time had been based around lines A, B, C, D, E, F and G. The lines would produce parts for a particular model of car, and these lines were later grouped according to zones as discussed in Chapter Six. The reconfiguration of the shopfloor layout meant a significant change to the way in which production was to be organised as this delineation would no longer exist, cells would now be grouped according to material movements on the shop floor.

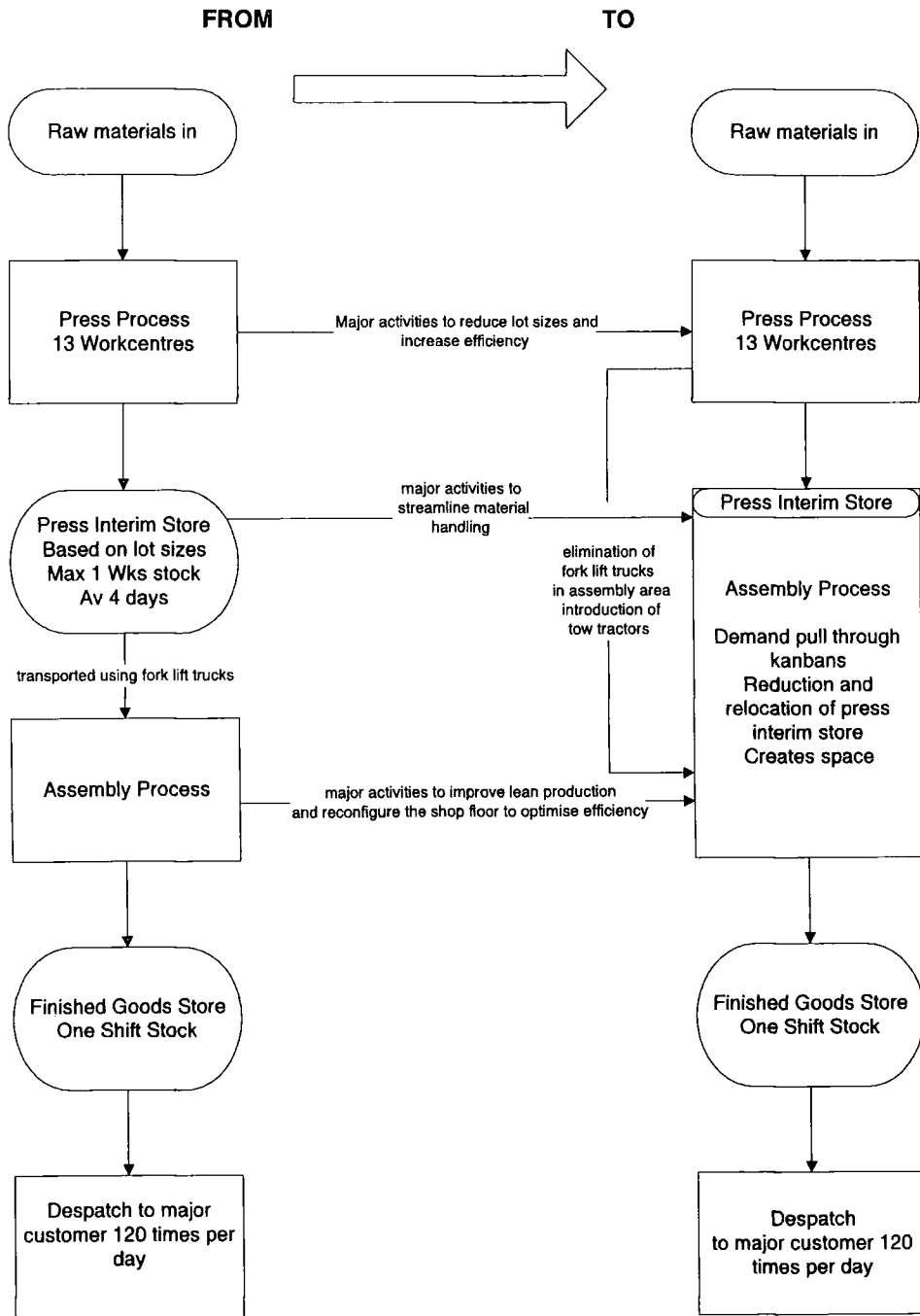
This move further developed the changes discussed in Chapter Six to develop team working through zoning and the creation of autonomous production units. One example of this was the amalgamation of two cells. One had supplied the other with sub-assemblies, which had previously been positioned at opposite ends of the factory. Following the change the new cell was managed as an autonomous unit.

The objective was further translated into targets/means, one of which involved introducing a demand-pull for parts from Assembly to Press through the introduction of a kanban system. Another was the elimination of fork-lift trucks and the introduction of tow tractors, as the efficiencies gained from relocating cells according to part size would

result in a reduction in the number of material handling movements on the factory floor.

This can be seen in figure 9.4 below.

Figure 9.4 Schematic representation of planned changes

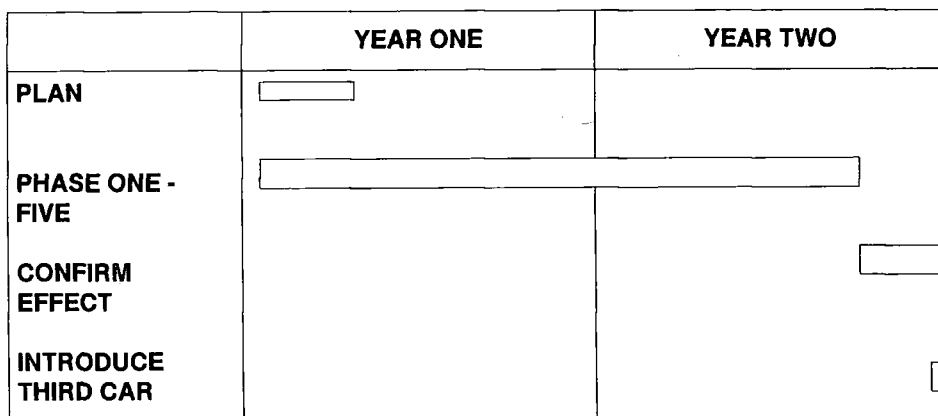


The figure shows the way in which the production process was to be simplified. Activities to reduce lot sizes and increase efficiency, to streamline material handling and improve lean production practices would enable reconfiguration of the shop floor in such a way that the Press Store was minimised and space was created to accommodate model changes and the introduction of the third car. The elimination of Press Store and introduction of kanbans would result in a demand-pull process from the cells, and cells would hold a certain number of parts. The improved efficiency of material handling movements would minimise the need for fork-lift trucks which were to be replaced by tow tractors.

Timetable for the change

The Production General Manager was responsible for managing the objective. The activities to realise the mid-term policy to reduce inventory and change the factory layout were carried out in six phases over two years as can be seen in figure 9.5 below.

Figure 9.5. Timeframe for the reconfiguration of the shop floor



The planning for the change was carried out at the top of the organisation as objectives were translated and agreed between the MD and the General Managers. The objective was stated in broad terms and briefed in March 1997 to the next level managers by the general managers, and then across the company.

Further communications to update staff were carried out via the in-house newspaper 'Press On'. June 1997's edition reports the space-saving exercise which had by this stage already begun in the stores:

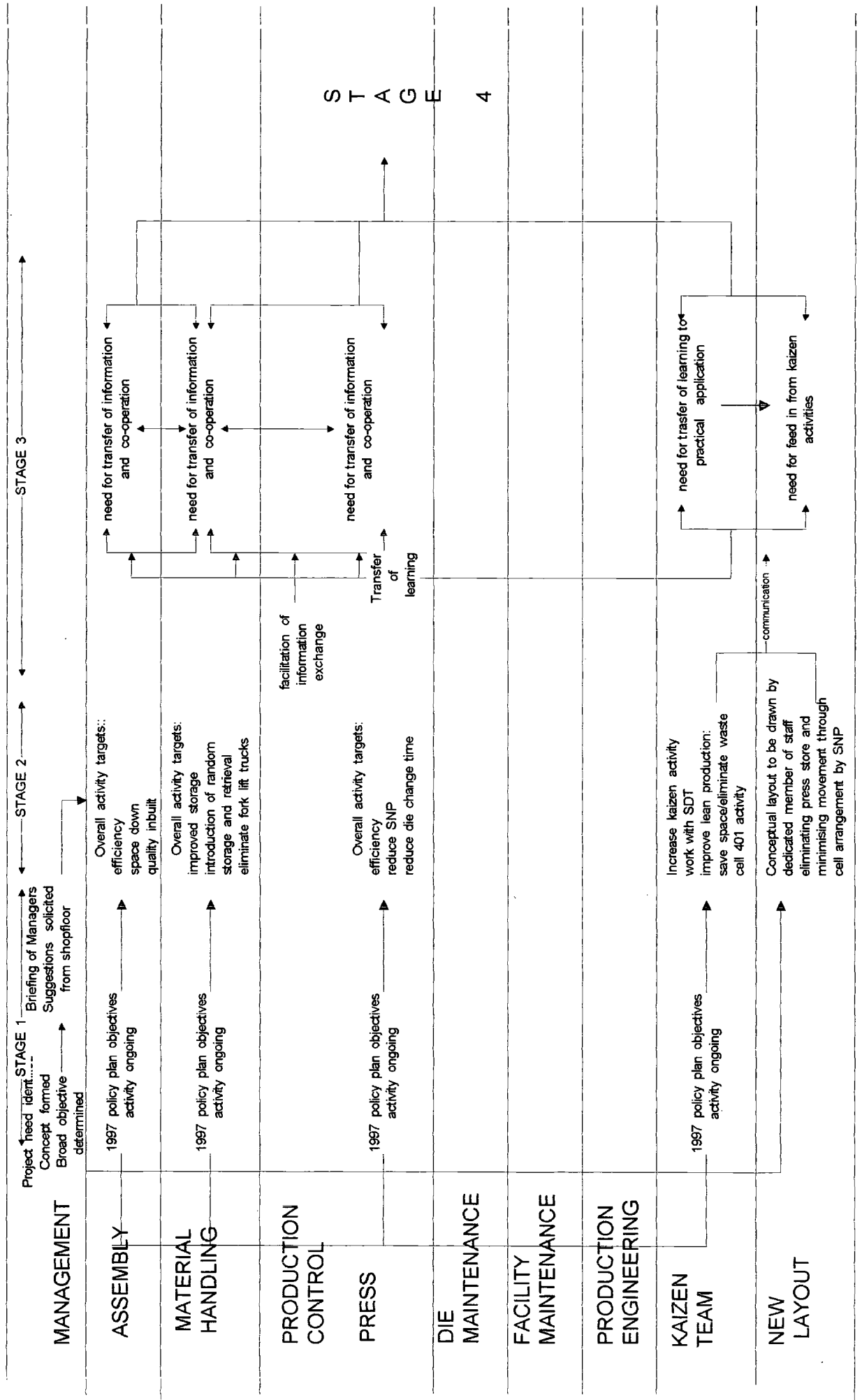
"Over the next two years it is planned to significantly re-organise the shop floor area ensuring maximum use of the space available and introducing improved production efficiencies and streamlining material handling activities",

and later in October 1997:

"Due to the imminent launch of the estate Primera and the Micra facelift, and also the future introduction of the third car, it has become necessary to release a large amount of existing storage space within the current Press Store to accommodate facilities which are now arriving. Material handling have to release the space in an efficient and controlled manner. This will be ongoing 1997/98."

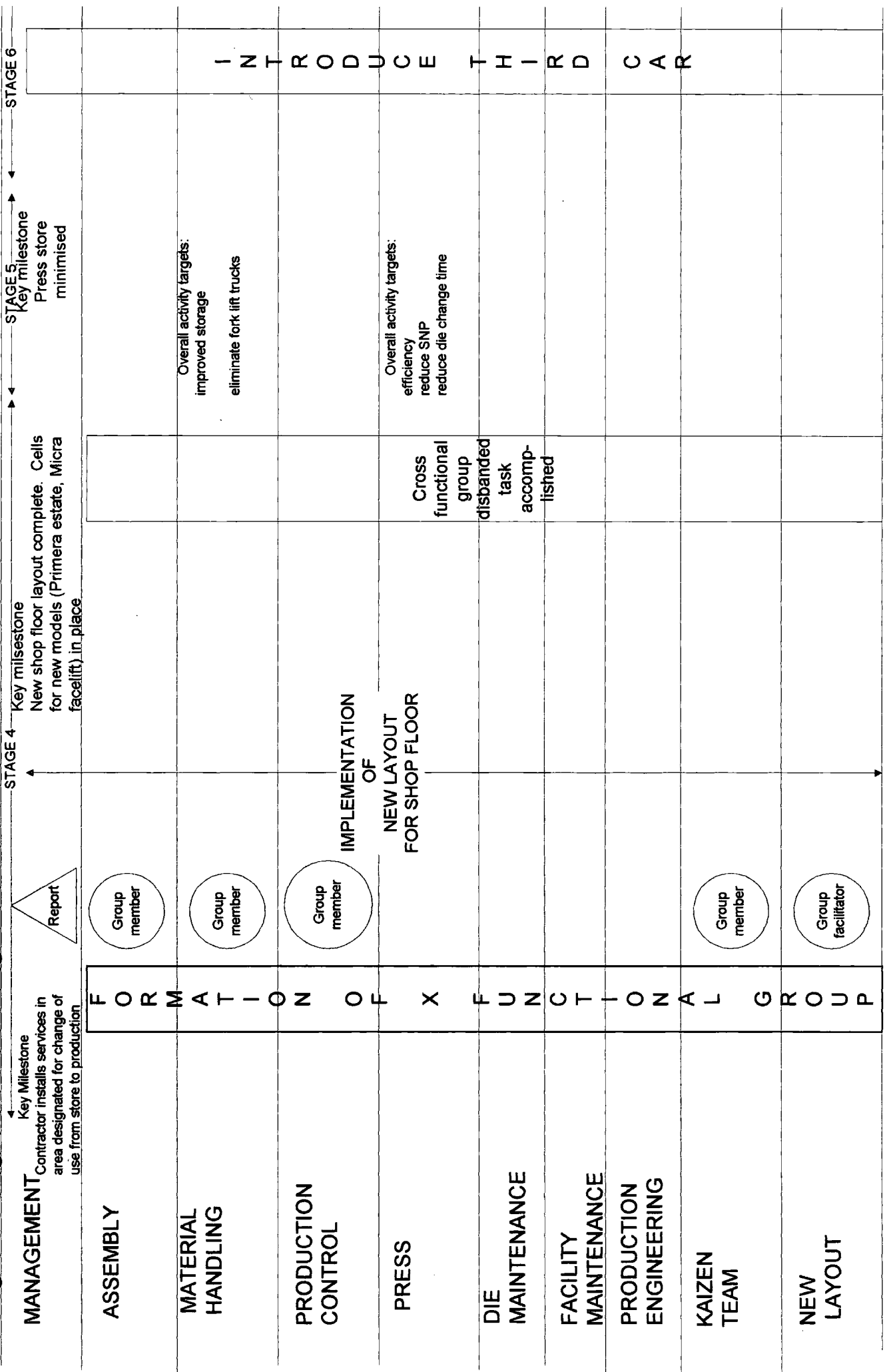
The way in which activities unfolded can be seen in figures 9.6 and 9.7 on the pages that follow. To the left of the figure are those parts of the organisation involved at some stage in objective achievement. Moving from left to right there was progression through a number of stages as identified through the research, and the figure details the departments involved and the timing and nature of that involvement. Each of these stages is explained more fully below.

Figure 9.6 Stage 1-3 of the reconfiguration



S T A G E 4

Figure 9.7 Stage 4-6 of the reconfiguration



Stage One

Stage One relates to the planning element for the objective. There was a recognition of the possibility of large scale change by the General Manager in an interview towards the end of 1995. At the beginning of 1996 there was a suggestion that this change would occur in that year, however 1996 was the year for the launch of a new model, and in view of the associated work load senior management at that time felt major change inappropriate. Because of the necessity of maintaining confidentiality the rationale and nature of the change remained within the domain of senior management. Planning towards the change was obviously ongoing prior to the public announcement in 1997, and the nature of this change illustrates the difficulty of encouraging participation of lower organisational level at this stage of the process.

Within the context of 1997 policy departmental targets/means were translated which resulted in departmental activity plans. Given the nature of the overall objective major change was required, and NMUK practice influenced the nature of the development of lean production at NYEL which would support the change:

"It is at the end of the day very customer-driven, NMUK have a production system called 'The Nissan Way', which is being driven down to us." (Production General Manager)

Production of a third car was a very high profile event, both publicly and within the company. The scale of the change required suggested that every aspect of the operation would have some involvement within this as the policies which flowed from the mid-term policy impacted upon and required something from everybody in the organisation:

"Every department has got policies which tie into that." (Production General Manager)

ALIGNMENT/INTEGRATION**Stage Two**

Stage Two involved all of the key organisational processes of the organisation: Press, Assembly and Material Handling; each of these areas translated targets/means which were specific to them. Deployment occurred as individuals agreed ownership of specific targets/means which related to their department, and where necessary teams were formed to manage the activities to support target achievement.

Deployment was not always hierarchical, as those considered to have most expertise in a particular area were given target ownership. One example of this related to material handling where the supervisor had ownership of a target to achieve fork-lift free zones, and a fork-lift truck driver owned a target which involved space saving:

“One of the fork-lift truck drivers is involved in the relay layout looking at how to free up ‘A’ line, which is the first step of eliminating the Press Store. You are taking out in one go 15% of the work in progress stock, so this driver will sit down and he has a plan, he knows SNP and lot sizes and this ties up with Press shop which is working on lot sizes.”

(Section Manager)

Towards the end of 1996 the Kaizen team was established with special responsibility to encourage Kaizen activity generally, and to disseminate learning from improvement activities which were undertaken, particularly with reference to one particular cell (cell 401) which was used as a model line:

“Because we are going to reconfigure the shop floor they have to have the learning to enable them to do that. So we looked at 401 and decided to use this as a model, it has gone down from a seven man cell to a four man cell and has stabilised production. As

an offshoot we have saved 87 square metres and made it part of kanban. So this has become a learning opportunity, and what we learn here will be applied elsewhere.”

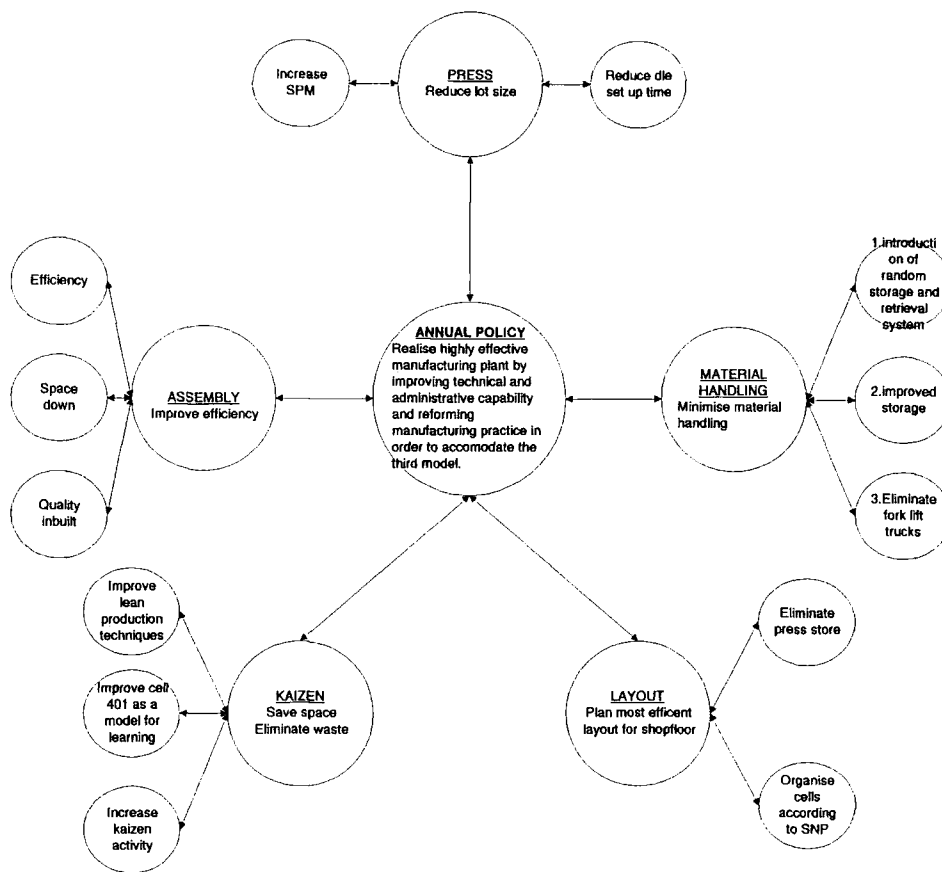
(Section Manager)

The team worked with NMUK's supplier development team (SDT) to improve lean production practices as outlined in Chapter Six. Employees throughout the organisation were asked to submit kaizen suggestions relating to reduction of the space required by each cell and process improvement. TQC themes were selected to support the overall reconfiguration objective.

A Section Manager from Production was seconded from his job having agreed a target to arrive at an ideal conceptual layout of the shop floor which would achieve the objective to eliminate the Press Store and reduce material handling movements through the organisation of cells according to SNP.

The way in which activities were linked and examples of departmental targets/means which translated from the policy objective are shown in figure. 9.8 below.

Figure 9.8 Stage Two: translation of targets/means



The figure shows the way in which activity at this stage remained at a discreet departmental level as targets/means were translated from departmental policy. For Press to reduce lot sizes required an improvement in efficiency through an increase in the SPM for each Press and a reduction in die set-up time. This required further translation as the target to improve Press efficiency was associated with means to achieve this through a process of data based prioritisation. For example a team was established up to examine the issue of scrap fall away; the SPM could be affected if scrap did not fall away cleanly following the pressing of a part, and this would create downtime which would affect Press efficiency.

Managers in Assembly agreed targets which related to efficiency, space saving and quality. Managers in Material handling agreed targets to streamline the movement of material around the shopfloor and improve storage arrangements. The Kaizen team established model cell 401 and examined ways in which bottom up improvement activities could be encouraged and learning could be transferred. The team designated to design the conceptual layout had targets to eliminate the Press Store and organise Assembly in the most efficient way to minimise material movement.

As with Study One there was no defined way in which target ownership was allocated, although recognition was given to the critical role target ownership played in the process:

"You rely on people with expertise." (Production General Manager)

Once ownership of targets had been agreed activity plans were established which stated the target to be achieved and the means through which this would be done. Some targets were quantified (to reduce the amount of space required for cell 401 by 15%) others were timelines (clear 'A line' Press Store by the 1st of June). Prioritisation of means through which targets were to be achieved was data based.

Achievement of the overall objective was vital, and given its customer driven nature there was very little room for negotiation of, or adjustment to, this; all activities were geared towards the launch date for new models. There was, however, still room for flexibility in the nature of the targets and means through which the objective could be achieved:

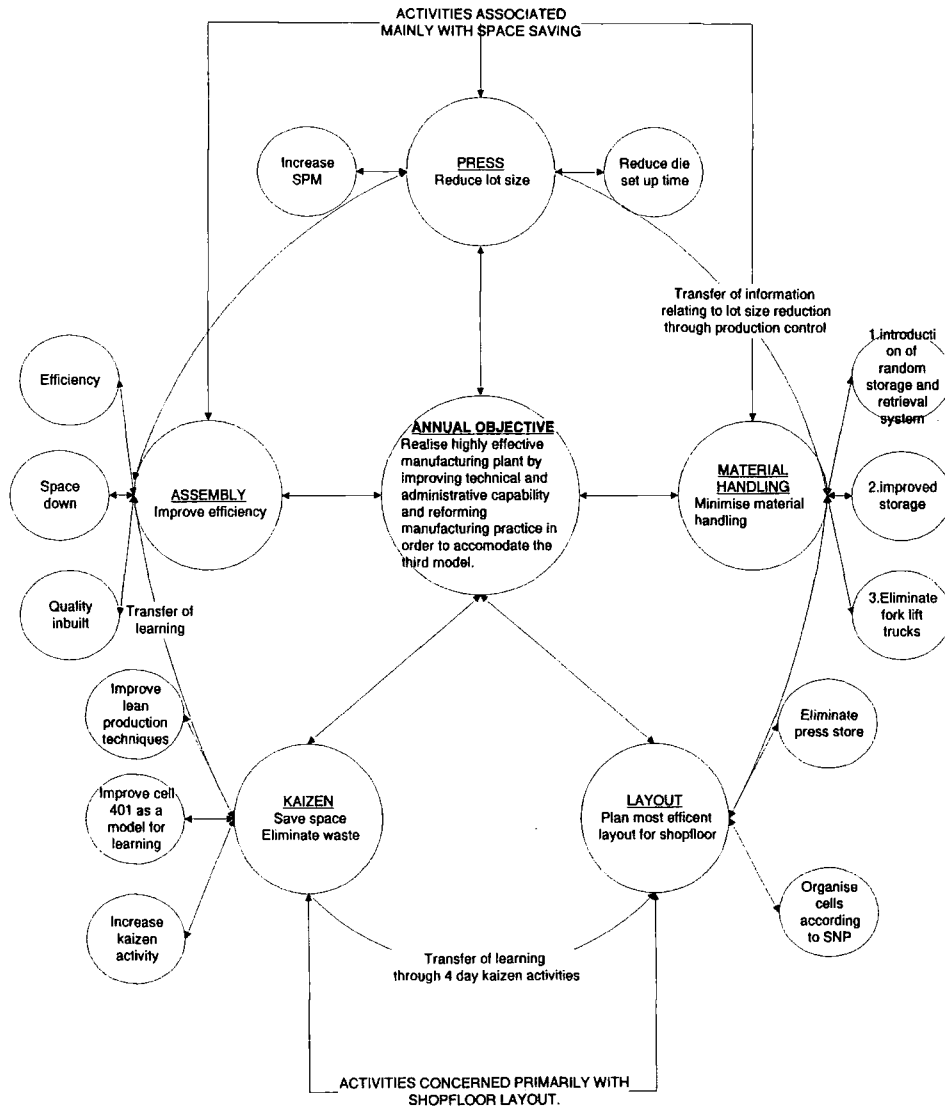
“The MD’s objective is the reconfiguration of the shop floor. I take that, I break that down into departmental milestones, I break it down into certain activities, I will agree targets and target milestones to achieve that policy. Even at the bottom level people are a part of it; these people are actually doing the layouts.” (Production General Manager)

Stage Three

Stage Three was identified as that stage at which progress had reached the point where it was necessary to consult with other departments and co-ordinate activities to transfer learning and information between the processes. This can be seen in figure 9.9 below.

The figure shows the linking of what had previously been discrete departmental activity as co-ordination occurred through informal mechanisms and reporting structures. Information flowed between Press and Material Handling via Production Control to ensure that any decisions made regarding new storage or internal transportation issues took into consideration changes to lot sizes which had been realised or were planned by the pressing operation.

Figure 9.9 Stage three: Interdepartmental information flows



One example of the sort of information flows required related to the need to clear the Press Store associated with A line which resulted in the introduction of a random storage and retrieval system:

“Material handling have come up with a new storage system and at the same time have incorporated lot size reduction, the Press shop were working on that, and have given them the figures which they have incorporated in Assembly, and Material Handling

have identified parts that can go not into Press Store, but straight to the cell.
(Production General Manager)

The new storage system provided an example of the way in which bottom up improvement ideas were incorporated into the process:

“John (the target owner) and I went away and agreed targets and means. He has taken on board a team leader and a fork-lift truck driver, he has come up with a schedule for action. They are introducing a totally new random retrieval system and the person who came up with the idea was a fork-lift truck driver. It worked because he worked in Press Store and knew all of the parts and locations. Now this activity has been filtered across the factory.” (Production General Manager)

Developments made by the Kaizen team were communicated to the assembly operation and were taken into consideration within the plan for the new shopfloor layout. Assembly, Press and Material Handling were involved in those activities which were primarily concerned with optimising use of existing space, while the Kaizen team and the Section Manager managing the new layout were primarily concerned with integrating new learning into activities relating to the new shopfloor layout.

Stage Four

Cross-functional management

Stage Four was identified as the point at which it was necessary to manage the objective through the establishment of a cross-functional team. This followed the installation of

services, which included electricity, water and air, by an outside contractor in the area of the factory designated for a change of use from Press Stores to Assembly:

“We now have it on paper with a plan of the shop floor. There is now a big area freed off and we are looking at moving new and existing cells into there which are high SNP or very low utilisation, it involves Material Handling as well because we are now planning to use the space that they have created. You can now see where separate targets have become a joint target. Prior to this the Press shop has had its own targets, because they have done that it enables Material Handling to relayout the Press Store incorporating random storage retrieval system. They have been working alone on these and what it has achieved is space. Those three departments can now come together to use the space.” (Production General Manager)

The target for the team was to co-ordinate the implementation of the new planned layout, and the target owner was the Section Manager who had been responsible for drawing up the conceptual plan of the shopfloor. Membership of the team comprised representatives of those processes critical to successful target achievement.

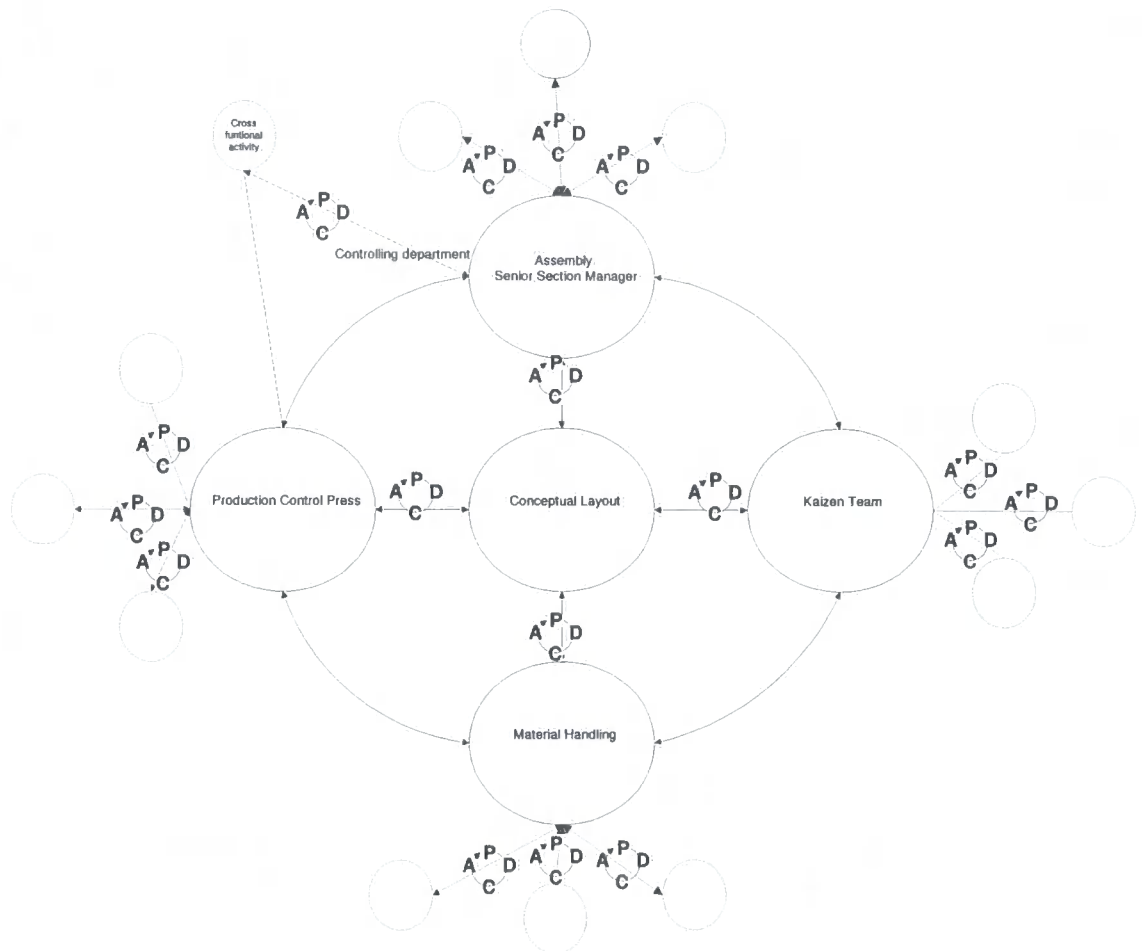
The role of the target owner was to communicate to the other team members what would be required of the departments to which they belonged to ensure that the new layout could be implemented smoothly. He had a plan of the shop floor which had been agreed with the General Manager, and which had taken into account the learning which had been gained from the Kaizen and SDT activities to improve lean production techniques.

“He will be explaining the logic of the moves. The individual representing Production Control for Press will go away from this meeting and know what he will need to stock build based upon the productivity and the number of days it will take to move the cell. ... The representative from Material Handling will change the location from which finished goods are moved to fall in line with the cell move..... He is directing their activities and aligning them.” (Production General Manager)

The way in which alignment of activities occurred can be seen in figure 9.10 below. The solid lines in the diagram represent the cross-functional team which existed for the duration of the objective to implement the new shop floor layout.

The relationships within the team were circular rather than hierarchical, with the focus and direction provided by the Section Manager responsible for the conceptual layout. The dotted lines represent groupings which were transient and dynamic in nature of which there were a varying number at any one point in time. One example of this was the teams which formed when cells were moved or process improvements were made

Figure 9.10 Stage Four: Cross-functional working



Teams were formed as a result of target/means translation or a bottom up improvement idea, and they formed to address a particular improvement and disbanded when this had been achieved. Bottom up improvement ideas were incorporated as process improvements which contributed to a more efficient shop floor layout:

“One of the operators approached me last week and he was talking about certain pieces of equipment, he knew that there was a cell going in there and he wanted to get involved in that work. So I sat down with the team leader, Section Manager and operator and showed them the shop floor plan. I said to the operator you know the process better than I do so you come up with a plan. A week later they came back and said ‘right we

want to do that.'... I have put a notice into Production Control that I want this cell on this date so we can move the cell, do the modifications required, and I will get the kaizen team and the operator involved. He will make it work and he will come up with the ideas to make it better." (Section Manager)

This example highlighted not only the transient nature of the groupings which were departmental or cross-functional, but the degree to which those at lower levels of the organisation were involved.

The existence of the discrete cross-functional team was seen as critical to objective achievement:

"This objective is achieved through prioritisation. Day to day activities are run primarily by people who have day to day responsibility. Quality can't be affected, efficiency and productivity can't be affected, so they are in the hands of the senior Section Manager in Assembly who runs that and he has very little input currently into the new layout. He is informed of the changes because it will become his area of responsibility once it is up and running. Because I prioritise this as critical we then dedicate certain people to it, and they tie up with production." (Section Manager)

This stage concluded towards the end of the first year when the planned moves to re-site enough cells according to SNP created the space which allowed the siting and installation of those cells necessary for production of the variant of the Primera, the estate, and the facelift for the existing Micra. At this stage the implementation of the new shop floor layout was complete, with the exception of one or two minor moves

which would be implemented in the next planning year. The cross-functional team had accomplished its task and it was disbanded:

“At the beginning everybody worked separately. Material handling did their thing and Press shop did theirs and then they all came together. The leader of the group tasked with implementing the shop floor change would say ‘I need that part of the Press Store to be gone by August,’ and Press shop would say ‘that means our lot sizes need to do that,’ and Material Handling would say ‘right to accommodate that I have got to free up x amount of space.’ That was when we needed the cross-functional team, and they came together and created that, so basically they now disband. Material handling now have the major activity to do, eliminate fork lift trucks and eliminate Press Store.. It will all come back together.”

(Production General Manager)

Stage Five

Stage Five was identified as the stage at which individual departments continued to focus upon overall activity targets. Focus in Press continued to rest upon reducing die set-up time and increasing SPM as the drive towards the longer-term objective of reducing lot sizes continued. Material handling continued to focus upon reducing the frequency of movement around the shop floor which would lead to a large reduction in the number of fork-lift trucks and the minimisation of the size of the Press Store. At this stage, because of the constraints of the period of the research, the field research drew to a close. The next major stage for the organisation was the utilisation of the space which had been made available throughout the period of the research to introduce the cells needed to produce the third car.

REVIEW

Activities were driven through the systematic application of the review process. Throughout the different stages as outlined above review was occurring at different levels and frequencies. The cycles of review varied according to the activity undertaken and are denoted in Figures 9.10 and 9.11 by the PDCA cycle. At both a departmental and cross-functional level there was no formal timetable of review, it was as needs dictated and, when the targets had been successfully achieved, the teams disbanded.

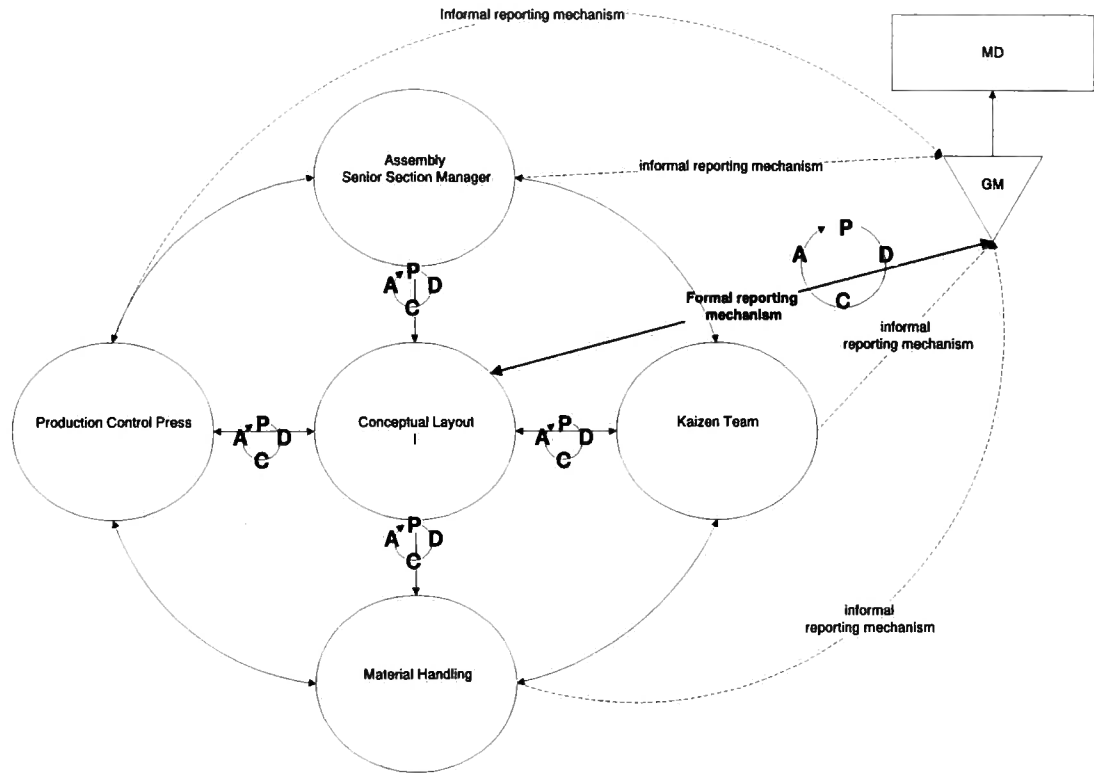
Overall review of progress was carried out by the Production General Manager:

"...basically it is feedback, you are out there, you have got to be out there. You also have regular reviews, in Press shop we have the monthly meeting which tells us everything from die set ups. You know that the infrastructure is there because you are getting the information... every month the data on the schedule is updated and it gives you the status of where we are. In terms of the space reduction we have reviews sometimes three times a month."

The progress of the activities of the cross-functional team were reviewed at a senior level on a fortnightly basis when the MD, Production General Manager, the Section Manager responsible for co-ordination of the layout and a Material Handling representative met for a formal review of progress. Formal documentation was produced by the group in the form of agendas and minutes of meetings through which actions were decided and reviewed. The PDCA cycle was applied at each level of activity.

At the top of the organisation informal reporting links existed because of the proximity of working relationships; these can be seen in figure 9.11 below.

Figure 9.11 Stage 5: Reporting mechanisms



Summary

This study demonstrated the way in which policy had to respond to a change in customer demand by adapting mid-term. Interest in this objective rested in the potential complexity of activities associated with its achievement. The objective represented major change, not only involving the physical re-location of the shop floor layout, but also in the further development of lean production working practices. The timeframe for the objective was determined when policy was established and was two years.

Initial planning was carried out by the senior management of the organisation, but the scale of the change required organisational wide involvement. Management of the objective took a project approach. The objective was managed and reviewed at a senior level, and organisational arrangements for its management were fluid and dictated according to needs at the time. Discussion of the unfolding of the objective gives insight into its dynamic nature and the level and form of involvement of the various areas of the organisation over time.

Because of its dynamic and almost unpredictable path alignment and integration were almost impossible to separate as they were ongoing simultaneously within different parts and at different levels of the organisation. Deployment was not always hierarchical and involved individuals at every level of the organisation at some stage.

The interlinking of targets and means was critical to the management of the activities playing a central part in the management and review process. Target ownership was seen as crucial to success. This study suggested an approach to management which was more about organising than organisation.

The issues raised and the insights gained as a result of this study will be discussed in the following chapter.

CHAPTER TEN

RESEARCH FINDINGS: HOSHIN KANRI

Introduction

This chapter discusses Hoshin Kanri in light of the knowledge gained through the research experience. The conceptual model of Hoshin Kanri as presented in Chapter Four will be used as a guide for the discussion which will explore how far the insights which the research has provided can inform Western practice.

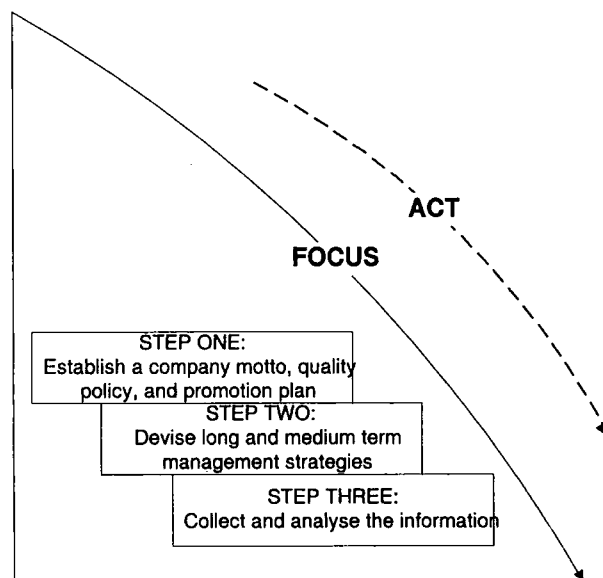
FOCUS**Figure 10.1 The FAIR model: FOCUS**

Figure 10.1 shows the Act stage of the Hoshin Kanri process which focuses organisational effort.

Prioritisation

Central to this stage of the Hoshin Kanri process was the prioritisation necessary to provide the focus for organisational action. This began at the top of the organisation as longer term policy provided a context within which shorter term actions could be determined. The trend in the literature to talk about a 'vital few priorities' has already been noted.

The study found that the number of objectives which flowed from annual policy varied over the term of the research with five being a maximum; this was at the top end of what later literature in the West considered as manageable. In NYEL however this was considered less important than the overall annual policy statement relating to customer and new model expectations and which provided a clear priority over that period.

The research found that this stage of the process remained firmly within the domain of senior management, which begs the question as to how far Hoshin Kanri can be argued to be hierarchical and centralised. This was largely determined by the degree to which senior management specified and dictated action, and highlights the issue noted in the literature (Fukuda 1988) of the difference which exists between East and West regarding the purpose of corporate strategy.

The research found that while senior management established the direction of the organisation they did not set out a clear programme through which this was to be achieved. The establishment of the 24 top level targets by senior management as discussed in Chapter 7 suggested a degree of involvement at a later stage of the process

than would have been anticipated, however as has already been noted this was perceived as a seedbed for germinating new ideas, and managers were able to develop the means through which these targets were to be achieved.

A related issue is the degree to which a balance between working towards an overall strategic direction while maintaining local responsiveness existed; the importance of which is argued by Feurer et al (1995). NYEL operated as an autonomous unit with the interests of the Japanese parent company safeguarded by the presence of the Japanese MD, however the issue of local responsiveness at an organisational level was somewhat blurred by the nature of the relationship which existed between NYEL and its major customer NMUK; there could be no doubt that to some extent the strategies of the two organisations were linked

Within the organisation itself there was evidence to suggest that managers had the freedom to determine priorities for the areas for which they had responsibility in the light of the direction set by senior management through annual policy. At an operational level there was evidence that this was being further developed as the introduction of zoning and reorganisation, followed by the reconfiguration of the shop floor resulted in a production process organised around semi autonomous units as noted in Chapters Six and Nine.

The research suggested that prioritisation was important not only at the top of the organisation, but at every other level; providing an organisational context gave the focus which provided a clear direction. When individuals saw the importance of a particular

organisational priority they used this in turn to establish the priorities which ordered their own work. This was evidenced in the distinction that was made throughout the organisation about targets which were perceived as 'nice to have', as opposed to those which were 'need to have.'

If the link between actions and policy was not always clear there was a perception that the short term operational concerns, which individuals experienced personally on a day to day basis and which impacted upon the way in which they did their jobs, were more important:

"..we are a lot closer to the shop floor, so we know exactly what a lot of the requirements are. We have a lot closer contact with a lot of other departments at our own level and know what the main areas of concern for them are. Although some of the targets are 'nice to have', they are not really 'need to have'. There are a lot more things out there that time could be spent on. At the end of the day when these come down these are the priorities that have been raised." (Engineer)

Providing an organisational context

Bechtell(1995) argued that in providing a context within which organisational action takes place Hoshin Kanri stops strategic planning falling into a black hole. However, providing organisation vision or mission statements is not on its own enough, and the question arises as to how far Hoshin Kanri goes beyond providing static exhortative statements for action. The research suggested that by linking short term action(annual) with longer term intent(mid/long term) an understanding of linkage to top level policy is developed; the direction of organisational action was seen to flow from policy:

"This all ties to the MD's policy for this year, if you look at his policy he has aligned objectives to achieve that policy." (Production Manager)

While the research noted the difficulty of promoting a detailed understanding of top level targets as discussed in Chapter Seven, the importance of providing a broad context for action rested upon the need to raise awareness of strategic priorities at every organisational level. This impacted upon the way in which individuals integrated strategic concerns at an operational level, and reinforced the importance of creating high visibility and transparency for organisational priorities.

One example of this arose in the study reported in Chapter Eight. Raising and maintaining awareness of the priority of the spot weld improvement was critical for its success, because while those involved within the spot weld improvement team could affect the process by implementing change initiatives, it was the cell operators who were in control of the process itself. Giving an understanding of the improvement through the team to the process operators, and promoting an increased awareness of and commitment to the overall target was necessary to focus actions and facilitate objective achievement.

One way in which this was evidenced was the increase in the number of concerns reported once the level of awareness of the improvement had been raised through implementation of those activities which arose as a result of its inclusion within annual policy. However the problems which arose for the organisation in maintaining this level of awareness, as was evidenced by the identification of re-spotted welds in the

second year of the improvement, suggests that the focus stage on its own is not sufficient. Maintaining the priority of an objective depends upon other stages in the process and this will be further discussed later in this chapter.

Breaking away from the status quo

Later Western literature (for example see Babich 1996, Bechtell 1995) talked about the degree of change associated with Hoshin Kanri as breakthrough or step change. This was written of as a level of change which would make a significant impact upon the achievement of the organisation's aspirations. Breakthrough change in a Western sense was associated with making one off structural improvements such as would be achieved through things like business process re-engineering.

Some of the literature sought to divide change into breakthrough and non breakthrough or incremental change, and Babich(1996) proposed a dichotic TQC model where the mission statement translated annually into performance management targets for kaizen, and the vision was used to identify gaps in organisational performance which would be addressed through Hoshin Kanri. The research found that in practice no such distinction was made, the organisation's management philosophy, longer term policy and annual policy were interdependent in providing a context for all improvement, whether that be classed as breakthrough or incremental.

Making the distinction between incremental and breakthrough change in this way was misleading as it failed to capture the way in which Hoshin Kanri focused the activities of the whole organisation to manage all change: Hoshin Kanri was about the

management of the whole organisation. In a Japanese sense the sort of change talked about by Akao was achieved by aligning organisational activity in such a way that everybody contributed. This change signified a break away from the status quo, and to achieve this implied that doing the same thing in an improved way was insufficient; what was required was finding new ways of doing things.

The study discussed in Chapter Nine was evidence of an objective which required major change and provided examples of the way in which working towards this individuals were encouraged to think about different ways of doing things. The study also reinforced the idea that major change could be achieved through the alignment of effort, rather than the sort of dysfunctional change implicit within a Western perspective of 'breakthrough'. One of the ways that this was achieved was through providing a focus which allowed the optimisation of resource use by signalling a clear direction for organisational action.

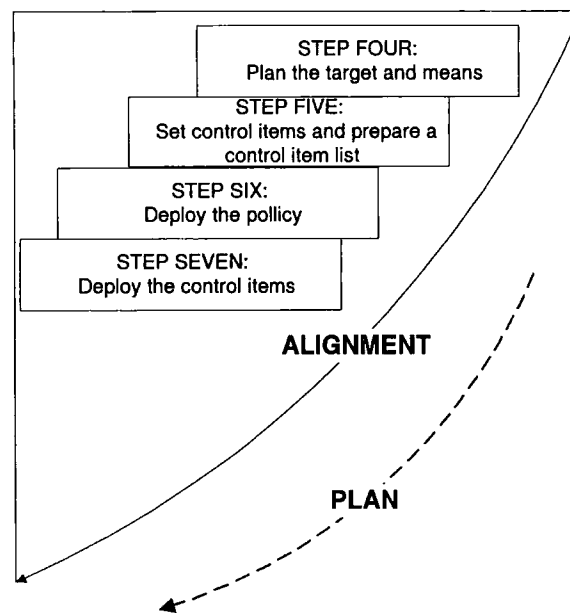
The research suggested that the activities which were undertaken to underpin incremental improvement were reactive and tended to be operationally focused; that is they were the result of an identification of issues which arose as a result of day to day operations. Those activities which were undertaken as a result of policy tended to bring about proactive change, and because they derived from policy were focused upon external as well as internal issues. The research found that for many working on policy related activities the change in terms of their daily work was not seen as breakthrough.

For NYEL this was based upon understanding at any one point in time available organisational resources, and thinking about new ways of using or developing them. This in turn could only be achieved through aligned organisational effort, and was evident in a number of the changes which were discussed in previous chapters, for example the introduction of zoning into the production process. This suggests a dynamic way of thinking about change, and according to NYEL was one of Hoshin Kanri's advantages; it created a culture which was open to continuous change. The scale of this change was found to be major, however the way in which it was presented may suggest a conservative approach to change which would not be recognised by a Western eye. The result of managing for change in such a way is an optimisation or a 'leverage' of organisational resources. It could be argued that it is this approach to resource optimisation that it is at the heart of lean production which was discussed briefly in Chapter Two.

The research found that the focus in NYEL was upon achieving substantial achievement in performance defined in QCDE terms, the achievement of objectives would result from improving operational effectiveness; high levels of performance constituted competitive advantage. The way in which the Hoshin Kanri literature developed in the West when talking about the nature of change probably reflects the problem associated in trying to 'sell' what to a Western eye would suggest almost a conservative approach to change.

Providing a vehicle for learning

The idea that senior management provided a focus through the establishment of policy was significant, but posed the question as to how far this was informed from the bottom up. In terms of strategic management it raised the issue of the thinking-doing dichotomy in traditional strategic planning. As has already been noted Akao suggested that the driving force for Hoshin Kanri was the Check stage of the process, and the research found that longer term policies were informed by looking back at the previous years performance and measurement of the current status of the organisation. The review process will be discussed more fully later in this chapter.

ALIGNMENT**Figure 10.2 The FAIR model: ALIGNMENT**

The plan stage of the cycle aligns organisational action to the priorities which emerged as a result of the focus stage of the cycle.

Co-ordination

It has been noted in the previous section that alignment of organisational effort is the means through which Hoshin Kanri seeks to bring about major change; central to this, according to Akao, was the process of co-ordination. Later literature failed to develop knowledge of what co-ordination meant in practice and how this was evidenced in organisational terms, and this thesis attempts to develop knowledge of this process.

The difficulty for Western practice according to Lillrank is that Western observers often failed to recognise the social interfaces which make up the complexity of processes in Japanese organisations, and this has implications for successful implementation:

“Complexity refers not only to the complexity of the idea itself, but to the number and type of the social interfaces. Tools with rather clear cut applications, such as SQC require little abstraction... organisational arrangements with a high human component such as quality circles and policy management (Hoshin Kanri) require careful packaging before being transferred.” (Lillrank 1995 p975)

As was noted in Chapter Two Akao defines co-ordination as “ discussion, playing catchball and listening”(Akao 1991).

Catchball

In discussing why catchball is used within the context of Japanese practice Kondo(1997) suggests:

It is because the discussion that takes place amongst the people taking part at the various different levels of the organisation deepens their understanding of the policies and enables them to think about both the ‘necessary’ and ‘possibility’ aspects of the

proposed targets. Through this process companies hope to effect a qualitative change in top down mandatory targets turning them into bottom up voluntary targets. I hardly need to repeat that this is an extremely effective way of motivating people to achieve their targets.” (Kondo 1997 p247)

The emphasis upon catchball as a motivational aspect of the process was carried on in the discussion by Richa & Edwards (1992) who argued that one of the major benefits derived from the implementation of Hoshin Kanri is that which arises as a result of achieving consensus:

“We found that the most valuable aspect of policy deployment was the discussion that occurs during the process. This discussion forces different areas of the plant to reach a consensus on the trade-offs inherent in every manufacturing operation. Our experience is that a team that has arrived at a consensus on a particular program is much more likely to be successful in its implementation, because everyone involved has had input into the decision.” (Richa & Edwards 1992 p172)

Peter Drucker(1974) was the first to point out that the Japanese worked to reach consensus about organisational decisions prior to implementation. The difference between the Japanese and Western approaches is that reaching consensus is a consciously managed process which includes *nemawashi* as discussed in Chapter Six.

The research suggested that the catchball process had both a formal and an informal aspect. The formal aspect was that which involved the meeting structure through which policies were presented and targets and means discussed and finally agreed; this process

was outlined in Chapter Six. The outcome of the meetings were agreed policies and associated targets and means which resulted in the raising of supporting documentation which can be seen in the appendices. The informal aspect of catchball equates to the idea of *nemawashi* and took place outside of the meetings when consultation occurred both vertically and horizontally in order to test ideas and draw upon wider experience. The formal catchball phase had a time limit to it in as much as it covered the time period from the translation of annual policy following its presentation by the General Manager in October to the raising of implementation plans which were operationalised towards the end of January. Informal catchball was happening behind and supporting this activity.

Catchball was central to the process of co-ordination in the development and deployment of targets and means, and was the process through which participation at all organisational levels was achieved. But while Hoshin Kanri involves management of the whole organisation how far could catchball be perceived to be hierarchically stratified? This was determined to some extent by the degree to which it allowed those at lower organisational levels to play a part in determining individual targets/means which contributed to annual policy.

The research found that those objectives which translated from policy and had an operational bias such as the spot weld improvement discussed in Chapter Eight allowed little freedom for the determination of individual action by the time they reached a shop floor level. It was inevitable given the nature of the process and the standard operating procedures that applied, that as the targets were deployed the means which resulted were

almost predetermined, and by this stage departmental policy had given way to prescriptive implementation plans. In this instance catchball as a consensus building process did not occur at lower organisational levels. However the research also found that while the involvement of individuals lower down the organisation was restricted because there was little scope for negotiation regarding alternative courses of action, there were other ways that they could contribute to the process.

One way in which lower level participation was encouraged in establishing targets and means at an operational level was through the devolvement of ownership:

“One of the team leaders was interested in getting the motors refurbished and that was all within the press shop budget. So we said: ‘right here is 14K get the motors sorted out’. He is running with that now.”(Engineering Manager)

This was further evidenced by membership of teams which focused upon policy based activities, with all of the responsibility that that entailed, and which was accepted as part of normal work. Catchball was part of the working of these teams in reaching agreement regarding targets/means. Several examples of such teams were evidences as part of the study in Chapter Nine such as the team which had a target to introduce a new form of storage, which resulted in the introduction of a new racking system which incorporated a process of random storage and retrieval.

The research suggests that involvement of individuals at lower organisational levels in the catchball process is determined by the nature of the objective which flows from annual policy. An operationally biased objective as discussed in Chapter Eight because

of the nature of the activity and the existence of standard operating procedures is likely to reduce the scope for discussion regarding alternative courses of action, while the reconfiguration objective in Chapter Nine which required more dynamic management is likely to give much more scope for discussion because there is a greater latitude regarding alternative courses of action.

The research suggested that involvement was seen as an important factor in ensuring success of initiatives:

“What makes this different is involvement, everyone has a copy of the policy. I take the reconfiguration of the shop floor objective, I take that it is broken down into departmental milestones, it is in the policy to get rid of the press store. It is broken down into certain activities, I agree target milestones to achieve that policy. Even at the bottom level people are a part of it, these people are doing the layouts.” (Production General Manager)

One example of this which was noted above was the way in which a fork lift truck driver was seconded from his job for two weeks to plan and implement the random storage and retrieval system which translated from the reconfiguration objective.

The research suggested that involvement was important because it drew upon the expertise of the whole organisation thus facilitating alignment and allowing the achievement of the sort of major change which was discussed above:

“the only way to deal with them (demanding objectives) is to empower people, and essentially Hoshin Kanri should eventually enable that to happen by agreeing with people the targets and the means to carry through the activities.” (Quality Manager)

Involvement in NYEL was encouraged by a latitude in approaching work which reinforced a need to explore 'doing things differently':

"I have never been in a company where you have so much freedom, you can actually change the method in which you work. I always say to them (next line reports), whatever you are doing, if you can find an easier or a quicker way or one which suits you best then develop it. Don't implement it, but let me know what you plan to do and then we can try a pilot scheme or change it"(Section Manager),

and in line with the principles of Deming(1986) promotion of a blame free culture:

"..if you ever make a mistake you don't get penalised for it - things that I have done have never been 100% effective. In the long term they may have come to fruition but there have been no immediate gains, and no one has ever put me down for this."

(Section Manager)

This freedom to improve the way in which work was structured existed at all organisational levels but this had to be managed in a way which ensured that the change optimised resource use and was communicated and adopted by all who were affected by it.

Developing and deploying Targets/Means/Control Items

The studies reported in Chapters Eight and Nine required different organisational responses. The spot weld improvement was operational in nature and the research suggested that improvements tended to be identified reactively. The reconfiguration project was proactive in finding effective ways of meeting customer requirements. The drivers of the two objectives were different, as the spot weld improvement tended to be

operationally driven while the reconfiguration was new model and customer driven. They were both however externally focused and both were derived from policy; targets and means were translated accordingly.

The studies demonstrate differences in the way in which targets and means were translated. The operational focus of the spot weld improvement resulted in the translation of what can be described as closed targets which were achievable through improvements to organisational processes that were recognised and understood, and which were based upon and managed through QCD. This was evidenced in discussion of the co-ordination of targets and means where it was recognised that participation was restricted by the nature of the process itself. The space saving project was an open ended objective in that the ways in which this would be achieved were not recognised at the beginning; the establishment of targets and means was a dynamic and fluid process which was much more about organising than organisation.

This research raised a question regarding the role of co-ordination, including the importance and form of catchball, in the Hoshin Kanri process. Much of the above discussion suggests that it has a critical role to play in alignment by developing consensus and motivation through organisational participation and involvement, and the research supports the importance of this. There is however another aspect to the co-ordination process which the literature has largely overlooked, and that is the importance of interlinking the targets and means which support annual policy. This was hinted at by Kimbler:

“(Hoshin Kanri) provides the missing factor in managing successful activities, in that it provides the two way communication between project and activity detail that is necessary to ensure success.” (Kimbler 1993 p26)

It is this attention to detail that the interlinking of targets and means facilitates by providing an infrastructure through which their management can occur. In discussing the importance of the establishment and deployment of target and means Akao argues that: *“Successful policy deployment depends on proper administration of the system”* (Akao 1991 p49). In a Japanese sense administration refers to the ways and means of management.

The tendency to overlook the interlinking of targets and means and the shift to emphasise employee participation and motivation as outcomes of the co-ordination process began with the publication of the GOAL/QPC report (1989). The way in which the literature was dominated by Hewlett-Packard experience, and the impact this had upon the way in which Hoshin Kanri was talked about has been discussed in Chapter Two. The effect of this was to change the way in which policy was talked about as this generally was replaced by use of the word ‘plan’.

Within the context of Hoshin Kanri ‘policy’ has a particular meaning, stating what is to be achieved and the means through which this will occur. This is in contrast to a Western use of ‘policy’ which would tend towards an understanding based upon a top down directive. This trend was carried through in later Western and TQC literature

which typically focuses upon organisational culture and empowerment rather than management procedures.

Arguing from Japanese experience and in the context of lean working Ishida (1997) suggests that high worker morale and efficient working is not a guarantee of performance; Western commentary ignores how Japanese companies drive progress through objectives. This point is reinforced by Lillrank:

“The management structure for linking strategy to operational improvements and for providing the indirect form of motivation is called Policy Deployment(Hoshin Kanri). It includes organisational arrangements such as the setting of annual improvement targets, their breakdown to specific targets for each unit, education and regular management audits. During the first QC boom in the West this was not understood and therefore overlooked.” (Lillrank 1995 p980)

The importance of the interlinking of targets and means and the organisational arrangements through which they are managed was emphasised in the management of the reconfiguration objective:

“People have clear targets, every activity has clear plans and we review every month so you can pick up anything. When I say review it is either organised through a regular meeting with a certain format, for example if you are saying strategy, we have a monthly strategy meeting. Because you are looking at the long term there will be issues which as time goes on will drop into the short term. When I am saying I am reconfiguring the shop floor, it isn't just because we are doing space saving and kaizen,

it is because we identified a problem two years ago and we knew we had to have the relayout done in the next two years." (Production General Manager)

The research suggested that the nature of this objective as revealed in Chapter Nine demonstrates the importance of the close interlinking of targets and means, and their link to policy:

"At lower levels you are breaking policy down and getting targets, policy is the ultimate aim, that is where you are going." (General Manager)

Given the scale of the objective and its timescale the target and mean setting process was dynamic. Because at the beginning the way in which the overall objective was to be achieved was unclear, and targets and means were established over time as progress unfolded, this close interlinking was essential to the management of the activities.

Cross functional Management

The research suggested that cross functional management was an organisational arrangement (Lillrank 1995) which was important in facilitating alignment of interlinking target and means. As noted in Chapter Two the Hoshin Kanri literature which was influenced by Japanese practice touched upon structural arrangements for those policies and associated targets and means which would require management across internal organisational boundaries.

The suggestion was made by Akao that the need for these structures and the attention paid to cross functional management in Japan reflected a cultural difference between

East and West. Implicit was the assumption that such arrangements would not be necessary within a Western context. As noted above Kano (1993) recognised a difference in cross functional ways of working between East and West.

The research found that cross functional ways of working were seen as critical:

"..once this has been adopted cross functional teams can be utilised to understand all the problems and plan activities to overcome them. The attitude of 'it's his problem and not mine' can and must be removed.' ...Cross functional working also develops people in the ability to perform other functions." (Engineering General Manager)

However there were no special organisational arrangements for alignment of functional policies. The mid-term management targets discussed in Chapter Seven equated to functional policies in as much as they related to medium term aspirations for Quality, Cost, Delivery and Morale/Safety. These were subsequently translated into annual policy and were expressed within the framework of the QCDMS categorisation using the TQC step up sheet. They were further translated and managed through the vertical organisation; one example of the way in which this occurred has been discussed in the spot weld improvement study. This sort of arrangement for management is similar to that described by Kano(1993) and is similar to that of a Japanese organisation.

Anecdotal evidence suggested that there was a move among some Western organisations, particularly those involved in the automotive industry with Japanese parent companies, to develop structures for cross functional management. This included the formation of a TQC steering committee and teams which would be responsible for

determining top level functional policy i.e. those related to QCDE issues and developing and deploying relevant objectives throughout the organisation.

The research suggests that the importance of the organisational arrangements for cross functional management have been largely overlooked in Western practice and this case suggests that this is true of Japanese organisations operating within a Western context. This raises the question as to how far cross functional management for Hoshin Kanri needs to be redefined within a Western context, and highlights an area which requires clarification through further research in developing an understanding of how Japanese practice relating to cross functional management could inform Western practice of Hoshin Kanri.

Annual policy and the business plan

Akao(1991) raises the issue of the nature of the relationship between annual policy and the business plan. The research found that as a result of the interlinking of targets and means through translation from policy the resource requirements necessary to achieve targets were quantified; resources included financial requirements, man hours etc.

According to Akao agreement of policy related activities should be carried out prior to business planning and the establishment of budgets. This ensured that the need for the organisation to achieve longer term policies was not restricted by short term financial considerations. Short term activities were managed within the context of long term policy. This runs contrary to the financially driven short term perspective of Western industry and is in line with the Japanese attitude towards long term investment noted in Chapter Six.

The research found that in line with Akao policy came first:

“That basically is the first step - from that we can set budgets as to what our expenditure is going to be, and that relates to the business plan where we pick up what our expenditure, income and profit is going to be by the end of the year.” (General Manager)

The activities which underpinned Hoshin Kanri made the business plan achievable.

There was however a paradox in the research findings. Although there was a recognition that major change such as the reconfiguration study would require resources which were reflected in financial planning of the organisation:

“We submit budgets based upon plans, so the reconfiguration of the shop floor is going to have costs, you assess the cost looking at the policy. We submit budgets based upon policy and then they have to be agreed” (Production General Manager),

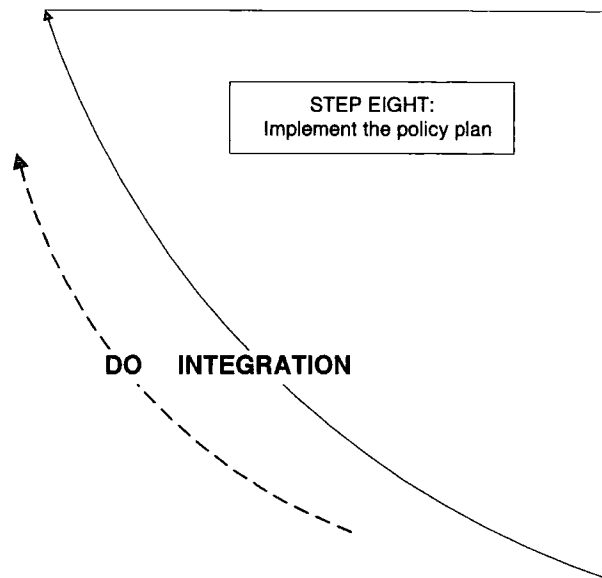
which suggested that policy came prior to financial planning. It was still the case that budget constraints could limit available courses of action:

“- there could still be a budget constraint, so it could be a case of within the policy and the subsequent budget constraint what can we achieve.” (Production General Manager)

The research found evidence that suggested where budget constraints for policy based activity existed, it encouraged individuals to consider new ways of doing things rather than narrowing the options available. This suggests that in this case Hoshin Kanri did not suppress innovative activity.

INTEGRATION

Figure 10.3 The FAIR model: INTEGRATION



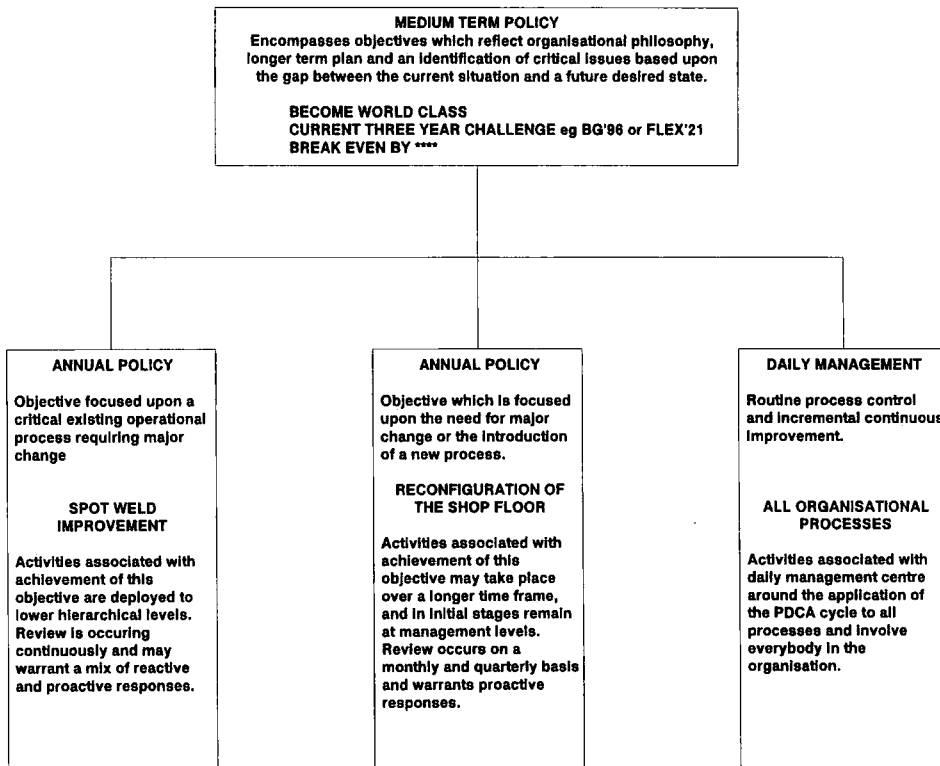
The DO stage of the cycle integrates longer term strategic concerns which were translated through the alignment stage of the cycle with the day to day work of the organisation

As noted in the review of the literature in Chapter Two this stage of Hoshin Kanri was largely overlooked. The literature generally followed Akao in assuming that the emphasis upon gaining consensus and the close interlinking of target and means would ensure that implementation would necessarily follow.

The literature raised questions regarding the different sorts of targets to be integrated in daily work, and there was a suggestion that they could be delineated into policy based departmental targets, cross functional targets and daily management targets. The research suggested that in practice this delineation is not clear because of the absence of

organisational arrangements for alignment of cross functional targets which resulted in a vertical translation process. The research studies suggested that a conceptual delineation could be made which is outlined in figure 10.4 below.

Figure 10.4 Categorisation of objectives from Annual policy



The research found that a distinction could be drawn between those objectives which were operationally focused such as the spot weld improvement, and those which focused upon difficult to define major change or the introduction of new processes such as the reconfiguration of the shop floor. The spot weld improvement focused improvement upon a critical operational process where the boundaries for activities were fairly predictable, the reconfiguration of the shop floor focused upon a need for change which was complex and unpredictable. One of the issues for the research was to

clarify how the activities which flowed from these objectives were managed alongside of the routine processes of the organisation.

The research found that where the needs of a policy were complex and the means for achieving the targets uncertain, as was the case in the reconfiguration of the shop floor, a project led approach was used. The management of this objective was dynamic as targets were open and ways of organising towards them evolved. Research suggested that this objective, as an organisational imperative, was the sort of objective which had to be achieved out of necessity as argued by Nemoto(1987).

The critical issue was the way in which the objectives identified in figure 10.4 could be managed operationally to ensure that strategic priorities were not crowded out under the pressure of daily working, and the research suggested that there were a number of factors which influenced this.

Review

The research found that central to the integration stage of Hoshin Kanri was the PDCA control or management cycle. The check stage of the PDCA cycle acted as a driver for the integration process by providing information which informed progress and allowed reprioritisation of activities on a continuous basis. The understanding of control in Western literature relates to a need to monitor strategic progress and ensure the implementation of strategic plans, and suggests a static view of the concept which is contrary to the dynamic learning based approach provided by the application of PDCA

in Hoshin Kanri. There is acknowledgement that there has been little research in the use of strategic control systems:

"..the research that has been carried out suggests that despite the arguments in favour of strategic control systems, in practice few companies have yet made much progress with the developments and use of formal or explicit control systems." (Goold & Quinn 1990 p46)

Knowledge of the application of the PDCA cycle goes some way to informing practice and highlights the importance of the dynamic nature of the process.

The importance of review of activities at an operational level was evident in both of the studies reported in this thesis. Review in this sense was not a static concept, it required the full turning of the PDCA cycle, and this was evidenced in the second year of the spot weld improvement when only two of the scheduled meetings associated with the objective were held. While it was argued that the review process was carried on outside of the meetings this was based upon the fact that information was still being collated and circulated, it was not however being used to determine future activities; review in this sense became static and the opportunity for in depth problems solving was lost.

In the case of the spot weld improvement review was action centred in that it was the basis upon which corrective action was taken. In the case of the reconfiguration of the shop floor review was proactive because the dynamic nature of the objective required the provision of the information which informed the process through which future activities unfolded over time.

Cross functional ways of working

The research noted the absence of organisational arrangements for the alignment of functional policy. Cross functional ways of working were important however to the successful achievement of policy based objectives as was found in the case of the spot weld improvement. At the integration stage of Hoshin Kanri this was evidenced by management of targets and means through the establishment of cross functional teams.

The research found that the way in which these teams worked affected the priority given by individuals to associated activities in daily work. It was recognised in the discussion regarding focus that providing clear priorities and organisational context for individuals at lower organisational levels was necessary but not sufficient. The integration stage of Hoshin Kanri in providing the organisational structures through which activities can be managed provides the missing link.

Discussion of the spot weld improvement in Chapter Seven revealed that the degree of involvement of team members in the meetings, the communication of results, the action taken following the review of targets and adherence to the meeting schedule influenced whether the objective was perceived to be 'flavour of the month.' This in turn affected the priority given to related activities in daily work.

Target ownership

The research found that target ownership had a key role to play in ensuring that agreed activities were carried through because it provided organisational visibility and lines of accountability. This on its own was insufficient however, earlier discussion suggests

there was a need for individuals to understand the importance of their contribution to the organisational effort.

The degree to which providing this focus deterred opportunistic ways of working by providing a clear guideline for action remains open to question, as contrary to the principles underlying Hoshin Kanri as proposed by King (King 1989) which re-inforced Deming's TQC principle (Deming 1986), the research found that there was a link between target achievement and performance appraisal. The remuneration which accompanied this was not generally considered important by organisational members:

"I do not look at it to achieve an extra 2/3% or whatever that I have to get this done. My outlook is that if it needs to be done then I have to do it, at the end of the year it is nice to get an extra few per cent but it is not the end of the world." (Engineer)

The link of achievement with performance appraisal is common in a Western context, and its link with policy based targets is therefore unsurprising. While contrary to Deming's (1986) principles this practice of linking performance with remuneration is not uncommon within a Japanese context either. Dunphy's (1986) history of Japanese enterprise stresses the importance of linking objectives to performance management, which in turn links to production targets. As production targets link to continuous incremental improvement this begs the question as to how far achievement of policy based targets is rewarded in the context of Japanese practice. This highlights another area for future research in determining how far Japanese practice can inform understanding of the means through which policy based targets are prioritised in daily management

The way in which activities relating to targets were integrated with day to day work was determined at an individual level, and depended upon the way in which their priority was understood:

"..it is down to experience and knowing what can wait. There are two jobs we have going now, if I do not make them a priority every day then we will not make the new car. So with a soft issue like training the maintenance technicians that obviously falls behind. Reduction of weld spatter is nice to have - making the front end of a car is a must have. It is all down to experience really." (Engineer)

Where individual contribution to objective achievement was in a supporting role only, input was much more difficult to assess. It was suggested that where individuals felt that the objective had been imposed and they were not in full agreement with the priority it had been given i.e. it was a 'nice to have' rather than a 'need to have', it was possible to avoid working towards this:

"If I had a mind not to do it I could have pushed it to one side, but I like to see things done and finished. As projects come up like that, some of them do fall by the way side - one of the particular sayings is 'flavour of the month', but if I am given a specific job and I can see where it is needed then I always like to see it through." (Engineer)

The research found that the priority accorded to targets differed between individuals:

"Sometimes one section manager will put something a higher priority than the other, - one will see it as a 'need to have' and the other will see it as a 'nice to have', it is just down to opinion and individuality"(Engineer),

and this highlights the importance of the continuous process of review to ensure that proactive management of targets is occurring.

Daily management

Daily management was necessary if short term concerns were not to take precedence. As policy filtered down through the organisational levels it became short term and operational, and if the activity was already a part of daily work, such as the spot weld improvement, it was not always recognised as strategic. This was seen to be the case when the decision was made to bring forward production of the Primera Estate as outlined in Chapter Six. Timeframes were condensed and the short term activities which resulted became pressing, and took precedence over other organisational activities.

In this instance the re-prioritisation that was occurring within the organisation was not well understood, as was evidenced by the perception held that the spot weld improvement had 'slipped' because the meeting schedule had fallen away because other strategic concerns had become more pressing:

"Yes that improvement has definitely slipped, it was nice before the new model launch."

(Engineer)

What was of importance was the way in activities towards the improvement were picked back up again once the new model was launched.

The research found that there were at times conflict between short term operational concerns and longer term objectives:

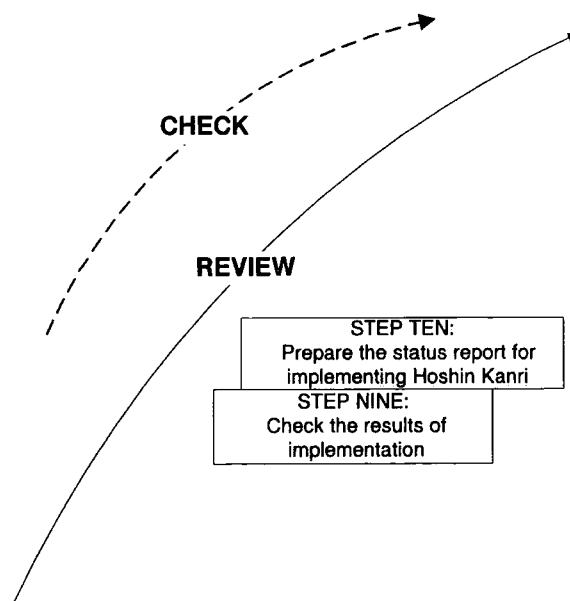
"From an engineering point of view the biggest task is to get the new model out . From the role that I do, although the company's aim is to get the new model out successfully, I have still got to control and maintain the existing machinery. To that extent there have

been quite a few times when the engineers have said 'I need support' and I have been unable to give it because my priorities have been different." (Section Manager)

The research suggested that two things were important at this stage, the preceding alignment stage and continuous review through the application of the PDCA cycle. The preceding stage ensured that individuals were clear about what they had to do, and the process of review ensured that in the face of change it was continuously being assessed.

REVIEW

Figure 10.5 The FAIR model: REVIEW



The check stage of the cycle drives the annual Hoshin Kanri process.

Annual review

Review as applied at the level of annual policy was the means through which the focus stage of the process was informed in a way which involved a bottom up flow of

information. Akao(1991) suggested that this was the stage which drove Hoshin Kanri by creating an awareness of the organisation's current capabilities; this was the foundation from which decisions regarding future aspirations were made.

The research found that the review process was regarded as important at this stage of the cycle and as was discussed in Chapter Seven was the foundation upon which policy for the following year was built. The process involved everyone in as much as information regarding progress was rolled up allowing learning from the bottom of the organisation to inform the policy which would become the focus for the next years activities. This required constant review of organisational progress using performance measurements which were linked and relevant to the way in which the organisation measured its success. This was evident in the application of review at all organisational levels and the use of the common language which resulted through application of the tools of TQC and categorisation according to QCDMS principles.

Responsiveness

The research found that the application of the review process was important in reprioritising activities and resources in the face of change. One of the advantages of the process for NYEL was the ability to know at any one point in time its status relative to current policy. This enabled the company to deal with the unforeseen which could occur at any time during the annual cycle when resources and management time had to be diverted to deal with a special situation.

The extent to which the systematic nature of Hoshin Kanri could result in a lack of organisational flexibility was judged by the ability of the organisation to respond in the face of change. The continuous cycle of review was perceived to be the means through which information could be rolled quickly up the organisation to enable management to determine the scope and scale of response to change. Some of the issues which arose were policy based, such as the need to amend mid-term policy in light of the decision by NMUK to produce the third car at its Sunderland operation; the implications for which were witnessed as a result of the reconfiguration study in Chapter Nine. Others were operational such as the unforeseen demand conditions experienced throughout the research which required an increase in the number of temporary staff and the introduction of a third shift.

The research suggested that Hoshin Kanri did not eliminate the problems/issues raised by short term dramatic change, but knowledge achieved through collection and analysis of data through the application of the PDCA cycle assisted the conscious management of their consequences. Response to change could therefore be integrated within a longer time frame. The length of the adjustment process and the ability of the organisation to respond depended upon a number of factors which were not always within the organisation's ability to control, for example the ability to recruit temporary staff with suitable skills was dependent upon the labour pool available in the area.

The extent to which Hoshin Kanri reconciled a need for providing organisational stability through focus upon key organisational policies with a need to change continuously was determined by the effectiveness of the review process. The research

found that one of the perceived advantages to the organisation of Hoshin Kanri was the creation of a culture which was open to continuous change and an organisational self awareness of current and potential capability. These two factors taken together enabled the organisation to manage proactively in the face of change, rather than be forced to manage reactively.

The research did not find any evidence to suggest that the 'Presidential diagnosis' based around Japanese practice which was given prominence in the literature was operative. NYEL did not follow practice reported anecdotally in other organisations of applying self assessment models. That is not to say that there were not developments of Hoshin Kanri over time, but these appeared to be driven from within the organisation as there was a recognition through use of the way in which the process could be improved.

Developments of Hoshin Kanri

The research found that differences existed across the organisation in terms of practice. This was particularly the case in the development and deployment of targets/means, and was hinted at in the spot weld improvement in Chapter Eight; for example within the quality department involvement in the catchball process in the establishment of targets and means occurred at lower organisational levels. This increased devolvement of responsibility was also evident in the engineering department in the second year of the research, ownership of the sort of targets which had previously remained at the level of Engineering Manager was devolved to Engineers; for example a target to reduce electricity consumption had been devolved, as had responsibility for a target associated with improvement of the carbon di-oxide welding process.

The cross functional approach to major improvements which had been used for the first time in the spot weld improvement as noted in Chapter Eight was held to be very effective, and as a result this approach was fostered with other major improvements which translated from policy in subsequent years. There was no evidence to suggest that at this stage this would develop into the establishment of the discrete functional committees which anecdotal evidence suggests are a future development for cross functional ways of working in the West.

The organisational restructuring which occurred over the life of the research as outlined in Chapter Six impacted upon the development of Hoshin Kanri within the company. First of all it impacted upon the spot weld process because as a result of this there was a change of team members, secondly there was a sense that people lost focus as they went through a period of adjusting to new responsibilities, and thirdly the mis-understandings which were apparent as a result of the introduction of zoning created the possibility of parochial behaviour, and to some extent undermined cross functional relationships and ways of working.

As a result of the organisational restructure responsibilities at the top of the organisation were divided across the three General Managers which made ownership of the annual Hoshin Kanri process less clear; previously the General Manager had driven the process. The MD issued company policy for the year from which each of the General Managers determined annual policy for their areas which they then developed and deployed. This raised the question as to the extent to which the success of Hoshin Kanri was impacted upon by clear ownership of the process. The research found that production and

engineering areas were continuing to manage policy using Hoshin Kanri, this was evidenced in the production area by its use in the reconfiguration of the shop floor, and in the engineering department through the spot weld improvement.

There was a perception however that alignment at the top of the organisation was not as successful as it had been in previous years. This perception was likely to be the result of the apparent mis-understanding which arose as a result of the re-organisation regarding the move to ensure that production related activities were the driver for all other organisational activities as discussed in Chapter Six.

The research found that two issues arose as a result of the structural changes which were impacting upon relationships within the organisation, and had the potential to impact upon the alignment stage of Hoshin Kanri. The first issue related to personalities as the organisation had with the second change discussed in Chapter Six effectively replaced one section manager with another from a different part of the operation; interviews revealed that this had created bad feeling in the engineering department.

The second issue related to the apparent lack of cross functional communication between the production department and the engineering department which resulted in a situation in which the production zones and engineering zones were no longer the same. Although in practice the impact of this was at an operational level it highlighted divisions at a management level which were created because there was a lack of understanding of the rationale for the changes.

Hoshin Kanri results

The research found that the results achieved from the development of Hoshin Kanri were not uniform across the company; there was a major disparity between the pressing and assembly operations. In the first year of the research Assembly had achieved a 60% improvement measured according to QCD as a result of focus upon three objectives, in the same period Press had achieved only a 6% improvement. The completely different processes result in a large difference in the scale of change which can be expected from the two different operations, however for the years in question the pressing operation did not achieve targets associated with policy.

The research showed that the success of the reconfiguration objective was largely dependent upon the ability of the pressing operation to achieve major change. This change was driven through the close interlinking of the targets and means associated with Hoshin Kanri and was discussed in Chapter Nine. The results achieved up to the end of the research period suggested that this approach was producing the desired results. This reinforces the earlier finding which suggests that across the organisation there was a difference in the development of the Hoshin Kanri process. It also highlights the importance to the process of the interlinking of policy based targets and means.

The General Manager made claims for the success of Hoshin Kanri suggesting that there was a substantial financial saving associated with the reconfiguration objective. The development of efficiencies and the space saved as a consequence of this resulted in a need to finance a much smaller extension to the building than would otherwise have

been the case. Similarly in the case of the spot weld improvement major improvements had been made in quality and associated issues. The award of the accolade of "Most Improved Supplier" by the major customer NMUK was reportedly the result of the improvement gained through the application of Hoshin Kanri.

Summary

This chapter set out to explore and answer some of the issues raised throughout the course of the research, and fulfils one of the contributions of the thesis in clarifying Hoshin Kanri within a Western context. Using the FAIR model presented in Chapter Four as a tool for guiding the research and subsequent analysis each stage of the process was explored.

Exploration of the focus stage of Hoshin Kanri suggested that the role of top management in establishing broad direction rather than a detailed programme for action was akin to the Japanese understanding of the nature of corporate strategy. The research confirmed the importance of prioritisation in providing clear direction for organisational action, and has given some insight into its importance in providing a level of awareness which ensures that individual action flows from and is aligned to policy. Annual policy as the focus from which activities flowed was given greater emphasis than the need for the 'Vital Few Priorities' suggested in the Western literature. Providing a context within which individuals understand and situate their work was found to be important in sustaining awareness of priorities at every organisational level. The research highlighted examples of the difficulties which could arise if this awareness was not maintained. The research found that the change implied by 'breaking away from the status quo' was

achieved by aligning organisational activity in such a way that everybody contributed. This may appear to a Western eye a conservative approach to change, and is in contrast to the emphasis found in the Western literature upon 'Breakthrough change'.

Exploration of the alignment stage of Hoshin Kanri highlighted the importance of the co-ordination process, and has given insight into the concept of catchball as a process through which participation occurs in the translation of policy based targets and means. The research suggests that the co-ordination process goes beyond a need for participation and involvement and emphasises the importance of management procedures in the development of interlinking targets and means. The emphasis upon participation and involvement in the Western literature has largely obscured the importance of these management procedures if this interlinking is to occur.

The research found that differences existed in the organisational responses required to manage some policies, and found that where the needs of policy were complex a project based approach was used. Differences which existed in the nature of the targets which translated from policy affected the level of involvement in the establishment of targets and means at lower organisational levels; the research found that this was inevitable given the operational bias of such targets. The absence of cross functional arrangements for the alignment of functional policies was noted and this highlights an area requiring further research in order to redefine cross functional management within a Western context.

Exploration of the integration stage of Hoshin Kanri found that this stage provided the structures through which activities in daily work were managed in a way which ensured that awareness of the organisational priorities which supported the strategic direction of the company were maintained. The alignment which occurred throughout the previous stage ensured that everybody was clear about what they had to do. The integration of activities relating to policy based targets with day to day work depended upon daily management through the continuous application of the PDCA cycle at an operational level. This was necessary if short term concerns were not to crowd out strategic imperatives. The turning of the PDCA cycle constantly informed progress allowing a managed reprioritisation of activities. Integration was facilitated by cross functional ways of working as the involvement of individuals in activities which related to policy based targets was encouraged through membership of cross functional teams. Lines of accountability were provided through target ownership and contrary to the principles espoused in the Hoshin Kanri literature there was found to be a link between this and performance appraisals, but this was not found to have a significant impact at an individual level. The efficacy of linking targets to remuneration highlights an area for further research to establish how Japanese practice may inform practice within a Western context. The absence of detail in the Hoshin Kanri literature generally regarding this stage of the process suggests that this is an area requiring further investigation in order to determine how far Japanese practice can inform understanding of the means through which policy based targets are prioritised in daily management.

Exploration of the review stage of Hoshin Kanri found that this was the stage of Hoshin Kanri which drove the whole cycle providing a bottom up flow of information

regarding current capabilities upon which future actions should be based. The periodic review which occurred throughout the cycle was found to be important in allowing the organisation to manage proactively in the face of emerging situations. The application of the process of review was the means through which the management of the whole organisation in achieving policy could be assessed.

The FAIR model has provided a framework to guide the research and analysis, and while each stage has been discussed independently the discussion itself has highlighted the interdependence which exists between the stages and the importance of recognising this for the management of the whole organisation. This has implications for the discussion in the next chapter which will seek to determine how far knowledge of Hoshin Kanri can inform thinking in the area of strategic management.

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**CHAPTER ELEVEN:
RESEARCH FINDINGS: STRATEGIC MANAGEMENT****Introduction**

The FAIR model presented in Chapter Four and used guide research and analysis throughout this thesis will be used to guide the discussion in this chapter. Discussion in Chapter Four highlighted the gap in the strategic management literature regarding how strategy is managed within the context of the organisation, and the lack of attention paid in the Hoshin Kanri literature to the implementation stage of the process. This Chapter will seek to ascertain the extent to which knowledge of Hoshin Kanri gained through this thesis can inform recent thinking in strategic management, and give insight into and develop the new management models as proposed by Hamel & Prahalad and Bartlett & Ghoshal in Chapter Three.

The new models of management refocus organisational action in such a way that what is required is a managing framework based around process. The studies presented in the previous chapters, particularly Chapter Nine suggest a way of managing based around organising rather than organisation. Organisational arrangements for the achievement of strategy were fluid and dynamic and were not limited by prescriptive organisational forms. This transient constantly evolving organisational arrangement provides insight into the way in which managing frameworks based around an understanding of processes are operationalised.

FOCUS

The focus stage of Hoshin Kanri provides a context within which organisational priorities are signalled thus raising organisational awareness and in turn providing a context within which individuals can understand their work; all of which is considered to be important if the necessary degree of change implied by a 'break away from the status quo' is to be achieved.

In discussion of their management model Hamel & Prahalad proposed the concept of strategic intent as outlined in Chapter Three, and defined this as 'having an ambition out of proportion with available resources.' The research found that this did not correspond to the understanding of change which underpins Hoshin Kanri. Hoshin Kanri is concerned not so much with reaching the unattainable implied by the concept of strategic intent, but with aligning all organisational resources in such a way that concerted actions brings a managed and achievable change. Such change was not necessarily the headline dramatic change Western organisations generally seek which may have dysfunctional effects, but was the sort of major change which was based around a need to 'break away from the status quo'; this required thinking about doing things in a different way.

For NYEL this was based upon understanding at any one point in time available organisational resources, and thinking about new ways of using or developing them. This in turn could only be achieved through aligned organisational effort, and was evident in a number of the changes which were

discussed in previous chapters, for example the introduction of zoning into the production process. What this suggests is a dynamic way of thinking about change, and according to NYEL was one of Hoshin Kanri's advantages; it created a way of working which was open to continuous change. The scale of this change was found to be major, however the way in which it was presented may suggest a conservative approach which would not be recognised by a Western eye.

The result of managing for change in such a way equates to the idea presented by Hamel & Prahalad of an optimisation or a 'leverage' of organisational resources, but the insight provided by this research suggests that there is a difference in emphasis. This difference rests upon the capability that Hoshin Kanri provides in enabling an organisation to be more responsive to its environment through the application of the tools of TQC and by providing the organisational arrangements which make feedback and learning more effective, thus allowing proactive management in the face of change.

Strategic intent according to Hamel & Prahalad(1990) is more than exhortation, it requires an active management process. As has already been noted the research gives insight into the way in which Hoshin Kanri goes beyond an exhortative statement to provide organisational arrangements through which a broad statement of purpose can be translated into meaningful activities which are then operationalised. Linked with the concept of strategic intent the authors argued there is a need to develop core competences which

support this, and which themselves depend for development upon 'a corporate wide strategic architecture' (Hamel & Prahalad 1991).

The model proposed by Bartlett & Ghoshal(1994) shifts the emphasis away from the notion of core competences to a need to understand the organisation in terms of a portfolio of processes, where it is the role of senior and middle managers to link diverse skills and resources to support strategy. The literature discussed in Chapter Two revealed that in providing a focus for a 'break away from the status quo' Hoshin Kanri's aim was an improvement of the 'overall control system', which refers to improving every aspect of organisational management. This raises the question as to how Hoshin Kanri, which promotes the idea of organisational self awareness linked with an external focus provided by a way of managing based upon quality, could identify or be argued to be an organisational core competence, or the extent to which it provided a structure through which diverse skills and resources were effectively managed to support strategy.

Discussion in previous chapters suggested that management processes such as Hoshin Kanri were difficult to recognise and transfer because of the nature of the complex social interaction upon which they are based (Lillrank 1995). Implicit within this is the notion that Hoshin Kanri would not be easily replicated; a prerequisite for a core competence. Akao(1991) however argues that Hoshin Kanri itself does not have a unique form in as much as it is context dependent, but this itself demands a recognition that it is based upon

the principles of TQC. Pettigrew & Whipp(1991) argue that the capability to carry through strategic change and transform it through use is an intangible asset; discussion of Hoshin Kanri suggests that it can provide just that capability. The research suggests that Hoshin Kanri provides the organisational capability through which competences can be identified and developed, and provides insight into the form that the 'strategic architecture' upon which the development of competence depends. Some insight is given into the organisational arrangements necessary to facilitate the effective management of organisational skills and resources which the authors argue are necessary in the new models of management.

Porter's (1991, 1996) attempts to clarify strategy in the face of the changes in the environment in which organisations are operating, presents strategy as a static concept. His argument that operational effectiveness is not the means through which competitive advantage is gained, and is thus not strategy, is based upon the belief that management processes such as TQM can be copied, but real strategy should be unique. It was through the strategic management of all aspect of the firm that NYEL improved the operational effectiveness from which competitive advantage was gained, perhaps more importantly it managed resources in a such a way that ensured consistency with strategy, and allowed the organisation to manage proactively in the face of change. This suggests according to Pilkington's (1998) argument in Chapter Three that NYEL follow the practice of Japanese companies in aligning production systems to corporate strategy.

While the research has drawn a contrast between the understanding of the scale of change implicit in the concept of strategic intent and that which relates to Hoshin Kanri similarities were to be found in the roles of senior management when articulating the strategic direction implicit in the concept of strategic intent. Bartlett and Ghoshal(1994) talk about this in terms of institutional purpose. According to the model proposed by these authors importance rests upon the way in which top management shape institutional purpose, thus providing a context within which strategy makes sense to all employees. This corresponds to the way in which purpose is understood within the context of Hoshin Kanri, which itself equates to that proposed by Fukuda(1988) as providing an overall direction rather than a detailed program of events.

Shaping institutional purpose on its own however was found to be insufficient. The research provides insight into the process which supports purpose through the development and management of closely interlinked targets and means. The research found that shaping institutional purpose went beyond a statement of strategic intent, and that while top management were responsible for shaping overall strategic direction and communicating this throughout the organisation, maintaining the awareness of organisational priorities became the task of anybody involved in the management of a policy based target. The way in which target owners managed associated activities affected the degree of priority placed upon it: this has been noted to be the case in the study of the spot weld improvement. Through the active management of such targets

awareness of organisational priorities was maintained, and organisational purpose was given meaning for individuals at lower organisational levels.

ALIGNMENT

The alignment stage of Hoshin Kanri is important in ensuring that organisational activities are focused. Hamel & Prahalad talk about a need to develop organisational consistency across organisational levels, but implicit is the suggestion that this is a horizontal process: *“Emphasis rests upon consistency at a corporate/business unit level through a shared allegiance to a particular strategic intent; at a business/functional level through allegiance to intermediate term goals or challenges, with lower level employees encouraged to invent how these goals will be achieved.”* (Hamel & Prahalad 1989 p19)

The research informs this model by suggesting that the authors present a partial view of the alignment process. What has been overlooked is the importance of the vertical co-ordination process which was managed alongside of horizontal co-ordination and was found to be critical in the achievement of the sort of organisational consistency that the authors suggest is necessary to the model that they propose.

Bartlett & Ghoshal(1994) talk about top management’s role in creating an environment for co-operation, and the need for a growth of vertical and horizontal networks to allow information exchange. The research found that co-ordination within the context of Hoshin Kanri goes beyond the notion of

information flows and co-operative ventures to activities which are based upon agreed ownership of interlinking policy based targets at all organisational levels. The research suggested that the co-ordination stage of Hoshin Kanri was one which required proactive management and organisational arrangements to facilitate this. Both Hamel & Prahalad and Bartlett & Ghoshal propose models which stress the need to achieve co-operation and organisational consistency, but fail to recognise the necessary organisational arrangements to achieve this. The alignment stage of Hoshin Kanri as discussed earlier in this chapter informs the model by providing insights into the form that these organisational arrangements may take in practice.

Within the context of organisational purpose policy is the foundation from which targets and means are developed and interlinked through the process of co-ordination, which included the catchball process. Catchball was found to operate at both a formal and informal level and encouraged a participative form of management; participation and involvement while important were found on their own to be insufficient. The emphasis in the literature upon the purely motivational aspects of the co-ordination process has to a large extent obscured the importance of the close interlinking of policy based targets and means which facilitates an attention to detail and provides an infrastructure through which their management can occur. This ensures that not only is strategy aligned but it provides the means through which it is managed in daily work.

Cross functional management was an organisational arrangement found to be critical not only in the alignment stage of the process but also in the management of targets in such a way which ensured that strategic priorities were not crowded out by the expediency of day to day management. The research suggests that the importance of the arrangement for cross functional management have been largely overlooked in Western practice.

The research findings inform the work of Pettigrew & Whipp (1991) as discussed in Chapter Three who recognised the necessity of breaking strategic intentions down into actionable pieces and allocating targets across the organisation, but gave little insight into organisational arrangements which would facilitate alignment of the activities which flowed from the targets.

INTEGRATION

The integration stage of the cycle relates to the process of managing strategic concerns alongside of daily work. Discussion of the strategic management literature in Chapter Three revealed a gap in knowledge relating to how organisations manage strategy in such a way that it connects to operations (Pettigrew & Whipp 1991, Reid 1989). According to Akao (1991), Hoshin Kanri's unique intention is the integration of an entire organisation's daily activities with its long term goals. Short term activities are themselves determined and managed within the context of long term plans. The research found that the integration stage was that stage of the cycle which was most difficult to identify as by this point activities which flowed from strategy had

become part of daily work, and it was at times difficult to distinguish between the preceding alignment stage.

In giving insight into this stage of the cycle the research provides insight into how strategy and operation connect. The findings suggest that management through FAIR necessitates the full turning of the PDCA cycle upon which it is based, as the stages are interdependent and one stage on its own is necessary but not sufficient. This was evident in earlier discussion which suggested that focusing organisational effort was necessary but not sufficient to the integration of strategic priorities into daily working at an operational level. The research suggests that integration of strategic concerns depends upon the preceding alignment stage through which interlinked targets and means are developed, and active management through a continuous review process based upon the application of the PDCA cycle, and for some objectives a cross functional team approach. Target ownership provided clear lines of accountability, and while performance measurement was associated with this the research suggested that it did not have a major impact upon target achievement.

Earlier discussion has revealed that objectives which flowed from policy required different organisational responses dependent upon their nature; the research identified a project led approach to objective management where needs of policy were complex as in the case of the reconfiguration objective.

The model of management proposed by Bartlett and Ghoshal (Chapter Three p66) redefines the role of the individual within the organisation calling for systems, policies and procedures that support a focus on people. This research provides insight into the organisation of strategic planning efforts which connect strategy to operations in a way that is participative. The research suggests that the close interlinking of policy based targets and means in the alignment stage of the process, followed by their integration in the daily management of the organisation to bring about a degree of change which necessitates involvement by everyone provides insight into how this may be achieved.

This suggests that Hoshin Kanri provides a framework for a participative way of working at all organisational levels, which goes beyond the emphasis which is placed upon the role of senior management in creating organisational consistency in the new models of management. The research suggests that Hoshin Kanri deliberately uses policy to manage strategic priorities in daily management, the interlinking of mid term management targets through translation into annual targets and then QCDMS targets which apply to different aspects of the operation gives an indication of the way in which Hoshin Kanri connects strategy to operations.

REVIEW

The strategic management literature generally overlooks the importance of review to the management of strategy. It is the process of review which

provides bottom up feedback upon which future decisions can be made, and in this sense it facilitates organisational learning.

As discussed in Chapter Three Mintzberg focused upon the difference which existed between intended and realised strategy, arguing that somewhere within the organisational black box within which intended strategy was implemented, there was a transformation process from which realised strategy emerged. The need to understand what was occurring within this transformation process was recognised by Pettigrew & Whipp (1991) as noted in previous discussion. The studies presented in this research suggest that Hoshin Kanri deliberately manages what Mintzberg would call emergent strategy, and it does this by continuously turning the PDCA cycle at every level of the organisation thus constantly informing the decision making process.

As has already been noted in Chapter Three Bartlett & Ghoshal(1994) argued that there was a need to move away from the formal control systems associated with strategic planning because they were unable to facilitate an organisational response to rapid change. The research gives insight into the importance of the overall periodic review of annual policy in allowing a response to emergent issues by providing the sort of organisational knowledge and awareness which informed both those decisions which had to be made in the face of changing situations, and those upon which future policy rested. This was seen to be the case when the introduction of the new car at its Sunderland operation was announced by NMUK, and NYEL had to assess and

manage the implications of that decision. This resulted in a change to mid term policy, and the way in which some of the implications of that policy were operationalised are the focus of the study in Chapter Nine. What was of importance in this instance was the way in which the activities which flowed from this change to policy were integrated with the ongoing activities of the organisation, and the subsequent reprioritisation which occurred. This was evidenced in the way in which the spot weld improvement was reprioritised in the light of changing demand conditions; the study suggests that Hoshin Kanri provides a way of managing which enables it to proactively deal with changing situations.

The idea that the review process in Hoshin Kanri is central to informing intended strategy and managing its emergent outcomes goes some way to addressing the questions posed by the work of Pettigrew & Whipp in providing an example of a process of management through which intentions are implemented and transformed over time. In facilitating a managed response to change Hoshin Kanri was found to reconcile the need to provide organisational stability with a need to change continuously.

Hoshin Kanri and Management by objectives

The issue has been raised in previous discussion as to the extent to which Hoshin Kanri can be associated with a hierarchical and centralised form of management which rests upon the idea of command and control. This arises because of the tendency in the Hoshin Kanri literature to draw a distinction

between Hoshin Kanri and Management by Objectives(MBO) (for example see Akao 1991, Babich 1996, Bechtell 1995). The rationale for this rests upon the argument by some commentators that it is the foundation from which Hoshin Kanri developed.

MBO had its origins in the USA with Du Pont and later General Motors, and was a process whereby senior managers set objectives for their subordinates based upon the principle that objectives were mutually agreed and individual performance was judged according to successful achievement. Peter Drucker(1955) was a leading exponent of MBO and saw it as a process through which managers could agree objectives with their superiors, and the means through which these would be achieved was determined by the individual managers themselves.

Humble, one of the key writers in this area, suggested that:

“Management by Objective is a dynamic system which seeks to integrate the company’s need to clarify and achieve its profit and growth goals with the manager’s need to contribute and develop himself.” (1970 p1)

In reality what emerged over time was a process whereby senior managers delegated objectives to subordinate managers who then determined how to achieve them; this process was carried out largely through the vertical organisation.

According to Fukuda(1988) Japanese managers have been practising a participative form of MBO for many years, but Akao(1991) argues that development of Hoshin Kanri reflected a change in the way organisations were managed:

“Management by objectives was created and promoted aggressively as a means to overcome the difficulties American businesses faced in the 1950’s as a result of a slumping economy and an intensification of competition.... both Hoshin Kanri and management by objectives can be regarded as products of their times, each responding to the specific needs of those times.....It was deemed necessary to establish a unique, comprehensive system that would incorporate the advantages of management by objectives while becoming a part of TQC.” (Akao 1991 p174)

This view is re-inforced by Ishikawa:

“... there is a danger that top executives will simply state objectives and policy and then do no more than exhort people to try harder, falling into the trap of managing by exhortation rather than scientifically. That is why the concept of management by objectives, once fashionable in the United States, has now been discredited.” (Ishikawa 1990 p426)

What was missing from MBO was the largely collaborative process of co-ordination in the establishment of means coupled with the continuous application the PDCA cycle at all organisational levels which this research suggests is central to Hoshin Kanri. Furthermore there is a difference between

Hoshin Kanri and MBO in the changing perception of where responsibility rests for individual contribution to organisational success. MBO is predicated on a need to 'control' individual action, Hoshin Kanri rests upon a requirement for individuals to take an active part in the process and thus control their own activities through the self management of work. This feature of Hoshin Kanri is seen as a necessary way of working within the new management model proposed by Bartlett and Ghoshal.

Akao(1991) argues that the key difference between Hoshin Kanri and MBO as noted in Chapter Two is the distinction which has been drawn between control items which measure results and those that measure the process; MBO is management by results, Hoshin Kanri is management by process. The close interlinking of target and means throughout the integration and alignment stage, and their management through the application of the PDCA cycle of review, were found to be important in differentiating policy deployment from other processes such as management by objectives.

Summary

This chapter has used the FAIR model presented in Chapter Four to explore how far knowledge of Hoshin Kanri presented in the previous chapter can inform current thinking within the strategic management literature. There is an acknowledged gap in the literature regarding the management of strategy within the context of the organisation, and this research provides insight into how strategy is managed at an operational level.

The research found a difference in the understanding of the change which underpins Hoshin Kanri and that implied within the concept of 'strategic intent' as proposed by Hamel & Prahalad(1991). The degree of change implied by the notion of 'strategic intent' is akin to that which later Western Hoshin Kanri literature talked of as 'Breakthrough change', and which as discussion in Chapter Ten found did not correspond to the understanding of change in practice.

According the new management models (Chapter Three pp61,66) achieving an organisation's strategic intent requires the development of core competences. While it is acknowledged that the form Hoshin Kanri takes is specific to an organisation, its foundation upon TQC principles suggests that its potential for replication would not give it the qualifying uniqueness necessary for recognition as a core competence. The research suggested however that Hoshin Kanri was an organisational capability which provided a foundation for the identification and development of core competences. The development of core competences rested upon 'strategic architecture', but the form that this architecture may take was left unexplained, although the authors stressed the need within the organisation for consistency and co-operation.

The understanding gained through the exploration of the alignment and integration stages of FAIR provided insight into this by developing an understanding of the organisational arrangements required for the development and subsequent deployment of targets and means. The research

suggested that co-ordination required pro-active management and interlinking of policy based targets and means through the process of catchball and cross functional ways of working. While participation and involvement were important, of equal importance were the organisational arrangements necessary for development and deployment of targets and means. The integration of strategic concerns into daily work necessitated the clarification of individual activities which resulted from the preceding alignment stage, and the application of the PDCA cycle of review at every organisational level. In providing a framework for a participative way of working at every organisational level knowledge of the alignment and integration stage of Hoshin Kanri develops the work of Hamel & Prahalad and Bartlett & Ghoshal by recognising the need to extend organisational activity beyond the top management's role creating organisational consistency and co-operation.

There is a gap in the strategic management literature regarding the importance of review in the management of strategy. The emphasis upon a need for formal control systems has tended to rest upon a static understanding of the process, and Hamel & Prahalad called for a move away from this approach. The findings presented a dynamic view of review which informed organisational actions through a bottom up process which facilitated learning. The organisational self awareness which resulted from the review stage of the cycle allowed the organisation to manage proactively in the face of change and provided understanding of the way in which strategic intentions were implemented and transformed over time. This suggested that the emergent

strategy which resulted did so through an informed and managed process, thus addressing some of the questions raised by the work of Pettigrew & Whipp, Reid and Henry Mintzberg.

There has been a great deal of emphasis in the Western literature upon the degree of correspondence between Hoshin Kanri and Management by Objectives; much of this can be attributed to Hewlett-Packard influence and its representation of Hoshin Kanri as 'turbo charged MBO'. The research found that in practice significant differences existed between the development of MBO and the practice of Hoshin Kanri which rests upon an understanding of Hoshin Kanri as management of processes rather than results.

The insight provided through this research has provided substance to the models proposed and has thus developed the work of Hamel & Prahalad and Ghoshal & Bartlett by giving insight into the form that organisational arrangements may take to allow the management of strategy at a daily operational level.

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CHAPTER TWELVE:**CONCLUSIONS**

This chapter will draw upon previous discussion and research findings to explore the implications of Hoshin Kanri for management theory and practice.

Outside of Japan the significance of Hoshin Kanri has gone largely unreported. The dearth of academic and research based literature in this area has necessarily resulted in a concentration in this work upon prescriptive sources. While the strategic management literature generally acknowledges the gap in understanding that exists regarding the way in which organisations manage strategy, it has to date failed to identify and develop knowledge of Hoshin Kanri as one means of filling this gap. One of the contributions of this thesis is to give insight into this, by exploring how strategy is linked with operations, through clarification of the Hoshin Kanri process within a Western context. The NYEL case study presented provides important insights into how strategy is managed in daily operations, and highlights some of the main issues for management and theory.

Hoshin Kanri development.

The research suggests that development of Hoshin Kanri in Japan, began with a need for the optimisation of organisational resources in the face of major challenges for Japanese companies competing in the global market (Akao 1991). The adoption of Hoshin Kanri in the West has been influenced by the awareness of the process gained by multi-national organisations through subsidiaries operating in Japan, and the growth in the number of Japanese organisations operating in the West. There has been no identified

academic research to date to assess the spread of Hoshin Kanri adoption, or the degree to which it has been successfully implemented.

This research found that rather than being the result of the one off implementation of a pre-existing framework, Hoshin Kanri developed over time at NYEL. While the form the process took was specific to the organisation, there was evidence to suggest that this was influenced both by the major customer and by Toyota. Hoshin Kanri was perceived as a natural progression of the way of working which had resulted from the implementation of TQM within the organisation.

Implications of Hoshin Kanri for organisational management

The implementation of Hoshin Kanri has implications for organisational management. Top level decisions must be based upon an understanding of how an organisation wide business process should be managed; if policy is to drive operations in a manageable way, it is important that top level managers understand the whole picture. This way of working requires that senior management articulate and communicate a clear direction for the organisation. A management style linked to individualism and short term performance does not sit easily with a need for precedence of cross functional concerns over department and unit concerns if Hoshin Kanri is to be effective.

It is a feature of current Western thinking about organisational management that the determination of policy, and the ways it is used to drive process and performance, is more exhortative than deliberate. This exhortative tendency is implicit in debates that argue employees should be able to understand an organisation's direction and purpose so they can develop and manage their own strategy, including its supporting targets and

means; a progressive and facilitating leadership with a visionary purpose that continually aims to renew and stretch organisation effort, encourage innovation and change through the empowerment of people are important parts of this tendency.

The works of Prahalad and Hamel (1990, 1994), and Bartlett and Ghoshal (1994, 1995), previously discussed in this thesis have been influential in the development of this way of thinking, however, as noted, there has been an emphasis upon the delegation and devolvement of authority in the strategy process, and a failure to develop the ideas of facilitating the link between top management goals and daily management. Factors which have affected the development of this link, and which are of relevance to Western managers, include the difference between East and West in the understanding of the purpose of corporate strategy, and the broader more encompassing nature of policy which translates from this (Fukuda 1988).

A linked issue is the contrast between the sort of dysfunctional change which Western management anticipate is necessary to bring about major results, and the apparent conservative change which results in the breakthrough results associated with Hoshin Kanri. This has implications for the way in which management both think about, and manage, organisational change; the case study suggests that breakthrough results can be achieved through the alignment of resources focused upon a number of improvement initiatives which would be considered to be operationally based and part of 'business as usual'.

The understanding of Hoshin Kanri as an organisation wide process for managing top level policy through participation in the strategic management process, has implications

for the way in which people are viewed and managed. Building upon TQM's approach to management, human resource ideas were central to the excellence literature of the 1980s (Bowen & Lawler 1992), Hoshin Kanri requires an extension of those ideas.

While the prime focus of this thesis is not people management issues, these have proved to have had a formative influence in the understanding of Hoshin Kanri in the West. Two streams of literature have been identified, one coming out of Japan which is based upon experience (for example see Akao 1991), and the other coming out of America which is largely consultancy led and has been strongly influenced by Hewlett-Packard (for example see Bechtell 1995, 1996). In general the US based accounts of Hoshin Kanri focus upon organisational culture and employee empowerment rather than the importance of policy in providing an interlinking system which bridges the gap between the short and long term in strategic management. The trend in the literature to emphasise the purely motivational aspects of Hoshin Kanri, has to a large extent obscured the importance of this close interlinking of policy based targets and means, which facilitates an attention to detail and provides an infrastructure through which their management occurs. This ensures that not only is strategy aligned, but it provides the means through which it is managed in daily work.

The case study presented in this research suggests that Hoshin Kanri involves close collaboration and a cross functional way of working, and represents a different approach to management in Western organisations, where planning and the deployment of policy are considered as segmented approaches, methodologies and tools. The participatory nature of Hoshin Kanri in determining, deploying and managing objectives has raised issues which are of general relevance to Western management and which go beyond

exhortation; the style of senior managers, the management of the review process, a need for focus upon critical issues and the degree to which those at lower organisational levels can be involved in the catchball process are all significant.

The foundations for Hoshin Kanri

What was evidenced in NYEL was Hoshin Kanri as a form of organisation wide management which was grounded in lean working and TQM. The research suggests that lean working as an operating philosophy is important in providing a context within which Hoshin Kanri can be effective; in practice the case study suggested that this was not about reducing existing resources, but managing change through their optimisation.

PDCA conditioned process management was associated with TQM, and was understood as an important foundation for improvement. Hoshin Kanri requires this process view of TQM, which gives a common approach to review and problem solving and the setting of priorities. Another key defining part of Hoshin Kanri is catchball, linked to the broader concept of nemawashi. In Japan nemawashi is a uniquely distinguishing attribute of organisation life, and is a process of consensus building that develops understanding about what is a right course of action for a particular policy. This form of informal networking was evident in NYEL, particularly at a middle management level prior to formal meetings. It was used as a means of sounding out opinion and gaining co-operation for courses of action. In Western organisations informal communications do help prepare the way for formal decisions, however they are considered to be beyond managing, in the sense as in Hoshin Kanri, that they can be facilitated to align agreement.

Is Hoshin Kanri different?

The research suggests that Hoshin Kanri is a development of TQM as typically practised within a Western organisation. TQM provided the foundation for Hoshin Kanri and was, in practice, daily management, which provided a flexible way of working that differs from conventional Western forms of quality management as a very process based form of activity. Hoshin Kanri is a necessary extension to TQM, acting as a strategic and complementary arm for operationally focused Kaizen.

Hoshin Kanri takes TQM further because it can be used to provide the necessary external focus for breakthrough change, and makes internal processes across the organisation respond quickly and in a concerted way. TQM's insistence on process management fits well with the idea that strategic management should be a managed process, where attention is given to the 'how' of achieving something as well as to the 'what' of the strategy being achieved.

Hoshin Kanri has been confused with a form of MBO that is so routinised and ingrained in Japanese practice that it is not recognised as significantly different by Western observers. MBO as it developed in the West came to be used to measure the performance of subordinates, where targets were typically determined as numerical goals set by superiors for their subordinates, in a way that meant that it was the latter who had their performance reviewed, and not progress towards objective achievement. This approach to management did not sit well with the underlying principles for TQM proposed by Deming (1986).

Hoshin Kanri is a process which measures objective achievement through process measurement rather than results, it sets out to achieve process improvement and measures the process itself rather than the objective owner. Hoshin Kanri through catchball and nemawashi, and in combination with the discipline brought to problem solving by TQM, makes the process of the development and deployment of targets and means subtly different to MBO. Furthermore, where MBO is predicated on a need to 'control' individual action, Hoshin Kanri rests upon a requirement for individuals to self manage their work.

Does Hoshin Kanri have universal applicability?

Hoshin Kanri's origins rest firmly within the manufacturing sector, however consultancy and prescriptive literature suggest that in America at least, Hoshin Kanri has been adopted in the service sector, particularly in the provision of health care (for example Kennedy 1994). There is a need to identify practical examples of Hoshin Kanri within the service sector in the West to explore the relevance and the form the process may take within different contexts, and to explore further the factors which affect implementation and development of the process.

This study presents an exemplar of Hoshin Kanri as operative in a Japanese company in the UK, but it is impossible to know how well Hoshin Kanri has transferred from a Japanese to a Western context. The emphasis in this work upon Akao's text in attempting to construct a framework for extending knowledge and understanding of Hoshin Kanri highlights a limitation of the thesis in ignoring the cultural issues which may remain unrecognised from a Western viewpoint. The question needs to be raised as to the extent to which Japanese management in general, and Hoshin Kanri in particular,

is culturally distinctive. The issues associated with cultural difference between East and West flag up further potential research questions related to those human resource practices which are the 'treasures' of Japanese management practice, i.e. lifetime employment, recruitment and promotion dependent upon seniority and single union representation, and their impact upon Hoshin Kanri development and implementation in the West.

Further questions which have fallen outside of the scope of this work include the need to explore the impact upon the Hoshin Kanri process of Japanese organisations who are not applying Japanese human resource practices when operating within a Western context. Previous experience in the West with TQM suggests that organisations had difficulty in both understanding and implementing this Japanese approach to management (for example see Wilkinson et al 1997, Wilkinson and Witcher 1991, Witcher 1995). There are views that the transfer of management innovations from Japan has not proved to be culturally specific, and that the specifically Japanese 'treasures' have not proved necessary to Japanisation (Morris and Wilkinson 1995). The research suggests that in the case organisation Hoshin Kanri developed to meet the needs of the organisation and the context within which it was operating. This is in line with the understanding that Hoshin Kanri should be developed in an organisationally specific way (Akao 1991), and suggests that as a way of managing it can be adopted by Western organisations. That is not to say that organisations would not experience difficulties in the development and implementation of Hoshin Kanri. Generally this processed based approach to organisation management with a foundation based upon TQM which requires good cross functional management, and a managed multi-layered process of

review may prove to be difficult for managers used to a conventional Western background.

The Japanese ability to integrate mutually supporting and complementary approaches and to combine people based (soft) and control based (hard) practices (Pascale and Athos 1982), is another important difference between East and West. Hoshin Kanri constitutes an organisation wide process for managing such complementarities in a holistic way. The question of the degree to which Hoshin Kanri is dependent upon elements that are uniquely Japanese like Nemawashi, is a moot one. While TQM and catchball are foundations for Hoshin Kanri, the research suggests that these are not culturally specific to the Japanese, as those companies in the UK who are developing Hoshin Kanri as a way of managing are almost entirely managed by Western managers. This is a key area and is a recommendation for future research, as knowledge of Hoshin Kanri practice in Japan could significantly inform Western practice, particularly the need to develop understanding of the way in which cross functional policies are managed and the organisational arrangements which exist to facilitate this, and the impact upon the process of performance management through the linking of individual target achievement with pay.

Hoshin Kanri and Strategic Management

The development of the Hoshin Kanri process within NYEL was the result of a recognition by top management of a need to align organisational resources to focus upon customers' needs, and to ensure that the resulting initiatives were integrated with the day to day operation of the organisation. The FAIR model used as a guide to this research has developed the three stage approach to management by giving prominence

to the importance of the integration of strategic and daily concerns at an operational level, moving away from the tendency that was identified in both the strategic management and Hoshin Kanri literature to largely ignore this part of the process.

The NYEL case study suggests that management through FAIR necessitates the full turning of the PDCA cycle upon which it is based, as the stages are interdependent and one stage on its own is necessary but not sufficient. This gives insight into the critical nature of management of this stage of the process to the management of strategy as a whole.

Hoshin Kanri deliberately uses policy to manage strategic priorities in daily management, and the case study suggests that it is the investigation and solving of issues that is key, as policy issues require investigation in order to suggest the means through which policy can be achieved. The responsiveness which the application of the review process facilitates suggests a process through which emergent issues can be proactively managed, thus giving insight into the way in which strategic intentions can be implemented and informed over time.

The research presented in this thesis extends the management models presented by Hamel and Prahalad and Bartlett and Ghoshal in Chapter Three by giving them substance, and providing insight into the organisational arrangements necessary to manage strategy in operations. The results achieved by NYEL suggest that development of Hoshin Kanri had contributed towards organisational success. This was particularly evident in the differences in the degree to which objectives had been achieved across those areas of the organisation where there was a disparity in Hoshin Kanri

development. The research suggests that Hoshin Kanri as a systematic approach to organisation wide management provides the link between the long and the short term in the management of strategy for the organisation, and provides a means through which an organisation can manage its resources proactively in the face of change.

The knowledge of Hoshin Kanri developed throughout this thesis has implications for the different approaches to strategic management which are current in the literature. Porter's view of competitive strategy argues that strategy is about making choices, which requires that organisations focus upon those activities at which they excel. Operational effectiveness, which Porter suggests brought some Japanese organisations competitive success, is not strategy. Operational effectiveness can be copied and overtaken by competitors, but real strategy is about establishing a uniqueness that cannot be imitated (Porter et al 2000). The research suggests that Hoshin Kanri helps organisations manage well, but while Porter argues that operational effectiveness is necessary but not sufficient, Hoshin Kanri provides a framework through which operational effectiveness becomes strategic; a link between operations and strategy which is difficult to make in practice. In fact Porter has little to say about the type of management that is required for co-ordination and making strategic trade offs. Limiting thinking about strategy to making decisions about competing choices, means that frameworks such as Hoshin Kanri can be overlooked; the academic literature to date suggests that this has certainly been the case.

An ongoing debate within the strategic management literature centres upon the way in which management of organisational resources provides a source of competitive advantage. Current thinking within the resource based view of strategy remains focused

upon, and heavily influenced by, the ideas of Bartlett and Ghoshal, and Hamel and Prahalad. Competitive advantage is gained by the way in which organisations seek to combine resources in order to develop unique capabilities. Barney, writing within the context of the resource based view notes that: *“Some have suggested that the ability to implement strategies is, itself, a resource that can be a source of sustained strategic advantage...it has also been suggested that implementation depends on resources that are not themselves sources of sustained advantage but, rather, are strategic complements to the other valuable, rare, costly to imitate, and non-substitutable resources controlled by a firm.”* (Barney 2001 p54)

Barney recognises the failure of many Western organisations to successfully implement strategies, and supports the view that emphasis in Western organisations rests upon exhortation rather than management. In practice the success of Japanese organisations, witnessed by commentators such as Bartlett and Ghoshal, and Hamel and Prahalad, has depended not upon the exhortation looked for and apparent to the Western observer, but on management processes which have supported this. Within the resource based view, Hoshin Kanri, which manages, co-ordinates and reviews those resources which are necessary to support the achievement of strategic objectives, has remained largely unrecognised. Barney's work raises the question as to how far the Hoshin Kanri process may be seen as a source of sustained strategic advantage.

The link between the resource based view and the debate about whether management approaches which Porter deems as bringing operational effectiveness, such as TQM or Hoshin Kanri, are really strategy or not, rests upon the extent to which such approaches to management provide a capability which is difficult to imitate. Given the recognition

which exists generally within the strategic management literature of the difficulty organisations experience implementing strategy, Hoshin Kanri, by providing a framework through which strategy can be implemented and refined in response to changes in the competitive environment, is arguably a process which would bring competitive advantage to the implementing organisation.

Another school of thought current in the literature argues that focus should rest upon the management of the whole organisation; how do organisational activities complement each other? Complementarities refer to the potential for mutually reinforcing effects when one or more business practices are joined together. Practices are complementary when doing more of one increases the returns to doing more of another (Whittington et al 1999). Research by Pettigrew suggests that European and Japanese organisations are adopting new ways of organising (Pettigrew et al 2000). This reinforces the findings of this research which suggest that the cross functional management structures developed to facilitate the Hoshin Kanri process is a way of working which speaks of organising, rather than organisation.

Hoshin Kanri is about the management of the whole organisation, and fluidity and responsiveness are achieved through daily management which seeks to integrate organisational activities. By highlighting the importance of cross functional management in the development of an organisational form which facilitates the management and alignment of resources, this research further informs this approach to strategic management by suggesting a way through which Whittington's complementarity may be achieved.

Knowledge of the Hoshin Kanri process adds to the debate current in each of the approaches to strategic management discussed above. More generally there is a trend in the literature towards a convergence of these three approaches, and the discussion recognises overlapping and links between them. Further areas for research could include: an investigation of the structures required for cross functional management within Hoshin Kanri, providing a comparative view of Hoshin Kanri within a Japanese context; the impact of changing human resource practices in Japan upon Hoshin Kanri as a way of managing the whole organisation; the culturally specific aspects of Hoshin Kanri and their impact upon the transferability of Hoshin Kanri to a Western context; the implementation of Hoshin Kanri within a service sector environment.

This thesis provides an insight into a process which has to date remained unexplored from an academic perspective. The need for further research has been highlighted in order to build upon and develop this knowledge. The contribution to the current debate in the strategic management literature has been outlined and areas for further investigation suggested. Perhaps the most valuable contribution of further research in this area would be to explore how far the Hoshin Kanri process can be recognised as a capability which not only adds value, but develops an organisational way of working that is difficult to imitate.

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REFLEXIVE ACCOUNT OF THE RESEARCH

Introduction

The qualitative nature of the research undertaken as part of this thesis requires an understanding of the role of the researcher within the research process. Reflexivity is about an explicit recognition of the impact of the research process on the research situation.

Taking a contextual perspective recognises the influence that the situation has on behaviour and that behaviour has on situations. The whole organisational situation is formative in explaining specific processes and behaviours. Context and behaviour are interdependent. Employees are participants in the research, the part that the researcher plays is not an uninvolved bystander observing organisational action, the researcher is a social being who has an impact on the behaviour of those around them. The research process is conceptualised as a social process which is heavily influenced by the choices made by the researcher as the research progresses. (Cassell & Symon 1994)

Reflexive account of the research

The nature of Hoshin Kanri makes it difficult to explore without open access to a practising organisation, and it took time to win that necessary trust. This necessitated building relationships over a long time frame, within this research this extended over a two year period.

The design of the research methodology largely determined the involvement of the organisational actors. Interviews were carried out following significant meetings and although attendance at the meetings would have been preferable senior management were not amenable to this for reasons of confidentiality. Given the nature of the process under investigation, dealing as it did with issues relating to corporate governance and strategy, it was unsurprising, and not without precedent, that the issue of access would arise.

The senior management team generally co-operated throughout the research process, although as demand conditions changed, access became more problematic as availability of time proved a major constraint. Over the research period problems arose because members of the senior management team left to take up employment with other organisations. This created access problems making it difficult to resolve particular issues which arose that required clarification following the cessation of their employment with NYEL.

The gatekeeper to the organisation was the Engineering General Manager with whom a good relationship was formed over time. He was happy to be part of the research because he was instrumental in developing Hoshin Kanri in the organisation and was keen to promote its use. He was very keen to promote a positive image of the company, but towards the middle of the research period as structural changes were implemented which affected his area of responsibility he began to question the way in which the company was developing. Within an interview situation he preferred interviews to remain untaped, and over time as trust was developed he was much more likely to be

forthcoming. Towards the end of the research period he left the company to take up a more senior position outside of the automotive industry, and at this point access to the organisation through the Production General Manager tailed off.

The Production General Manager while apparently amenable to inclusion within the research in initial stages prior to his promotion, proved more difficult to gain access to following from that. It is difficult to know whether this was as a result of a change in attitude towards the research study or quite simply the impact of the increased pressures which resulted from the extra responsibility. He was much more comfortable within the interview situation if he could remain with a structured presentation which may have been prepared for a meeting with either internal personnel or those from Nissan Motors UK (NMUK). As with the Engineering General Manager, he presented a very positive company image, but unlike him, he was not prepared to acknowledge at any time that the company may be experiencing any problems as a result of the changes which occurred throughout the period of the research.

The periods of structural change which are detailed in Chapter Six impacted upon interviews, this was particularly the case with the engineers who were affected by the changes. This influenced the perception that the engineers had of the level of involvement that they had in the decision making processes within the company. Once this issue had been identified, in order to gain some balance of views, the initial interviews which were held with those concerned remained open as the majority of those involved wished to talk about the changes and the way in which this affected them to someone whom they appeared to feel was an objective outsider. There was then a

follow up interview which allowed time for the initial reaction to the changes to have lessened.

Given the scale and ongoing nature of the changes to the organisational structure there was an impact upon a number of those involved in the research. The Engineering Manager's perception was that he had effectively been moved down a layer following the appointment of an extra general manager and the change in the delineation of responsibility between production and engineering. He viewed the changes that were occurring at that time negatively, and his conclusion was that they signified a change in company culture as the priorities for the organisation were shifting as the management of people became far less important than it had been previously. This was apparent in his view of the changed role that he had in the decision making process. He left the company three quarters of the way through the research following an approach by another automotive supply company. As spot weld objective owner this impacted upon both the progress of the improvement and the research itself. His view was that involvement in the research had provided him with a valuable management development opportunity, and prior to leaving the company he requested an interim report of research findings so he could use this to assist him in his management role.

This was not the only example of the way in which those involved in the research used the process as a way of developing individually and improving the process itself within their own areas of responsibility. A further example is provided by the Section Manager from the Quality Department, who implemented a new briefing system for his staff following research involvement.

Access to individuals was open in that there was no attempt to restrict who was involved. This was particularly evident in the case of the Quality Technician who was a member of the spot weld improvement team in its second year. He was prepared to question the company's approach to everything, was viewed as a rebel, appeared to be constantly the subject of disciplinary action and was quite happy to share his views. His identification of the incident of respotting of welds in the second year of the research provided valuable insight into the process; his role could almost be seen to be that of *agent provocateur*. As a result of some follow up after the research period was complete it was found that he had been promoted to the position of Team Leader.

All of those involved were willing to co-operate in the research and have interviews taped. There were only a few instances where those involved wished to make comments off the record, for the most part individuals were quite willing to respond openly to any enquiries and have their responses reported on.

The demand conditions over the period of the research reported in Chapter Six, and the constant organisational changes created access problems over time. There was also a loss of personnel at the top of the organisation and by the end of the research period of the original management team only the Production General Manager remained.

The research design proved to be an appropriate approach to addressing the research aims. The limitations of adopting such an approach have been explored within Chapter Five. The advantage of the approach rested in the way in which it provided direction by leading the research process in such a way that it gave order to the research as it

unfolded over time, allowing changes to be made in direction if and when necessary. It provided valuable and at times unexpected insights into the process under investigation.

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APPENDICES

- A1 NYEL Research Participants: Organisational Actors**
- A2 BG 96 Challenge Results**
- A3 Annual Policy & TQC Step Up Sheet**
- A4 Engineering Department's Annual Policy & Supporting Documentation**
- A5 Departmental Activity Schedules & Associated Review Documents**
- A6 Daily Management Rapid Response Sheet**
- A7 NYEL's Ten Step TQC Story**
- A8 Cross Functional Team Target: Documentation**
- A9 Spot Weld Improvement: Sample Minutes & Supporting Documentation**
- A10 Policy & Planning Documentation: Reconfiguration Objective**
- A11 Planning Documentation: Conceptual Layout Cross Functional Team**
- A12 Planning Documentation for a Bottom Up Improvement: The Reconfiguration Objective**

This appendices presents copies of a sample of the working documentation through which the Hoshin Kanri process was managed within NYEL.

The ordering of the appendices sets out to take the reader through the process by beginning with an example of one of the mid term challenges through which NYEL managed medium term strategy. This follows with detail from annual policy at a general level, which is then taken down a level of detail to departmental policy and associated documents, until by Appendix Six the reader can see the documentation the organisation uses to respond to operational problems at a daily level, and the steps through which improvements are managed via the Ten Step TQC Story.

Appendices Eight to Twelve give examples of some of the documentation and detail of the improvements which formed part of the studies in Chapters Eight and Nine, following the ordering of the studies in the main body of the thesis.

APPENDIX ONE

NYEL

**RESEARCH PARTICIPANTS:
ORGANISATIONAL ACTORS**

ORGANISATIONAL ACTORS WHO PARTICIPATED IN THE RESEARCH

Engineering General Manager

Engineering Manager

Maintenance Section Manager

Press Shop Engineer

Die/Tooling Engineer

Engineer Zone 1

Engineer Zone 2

Engineer Zone 3

Production General Manager

Section Manager Zone 1

Section Manager Zone 2

Section Manager Zone 3

Section Manager: Conceptual layout team

Team Leader Zone 1

Team Leader Zone 2

Team Leader Material Handling

Fork lift truck driver

Operator Zone 1

Operator Zone 2

Quality Manager

Section Manager Quality Assurance

Quality Technician

APPENDIX TWO

BG 96 CHALLENGE RESULTS



"BG 96"

4 YEAR STRATEGY PLAN

No.	Item	Measure	1992	1993	1994	1995	1996	Result 1996	Remarks			
1	CUSTOMER PPM	EC	A		3	2	1	0	TOTAL 65 PPM A, B & C	MAJOR IMPROVEMENT 1994 304 PPM 1995 99 PPM 1996 65 PPM		
		AB		40	20	10	5					
		ABC		200	100	30	15	10				
	DC	A		3	2	1	0					
		AB	PPM		40	20	10	5				
		ABC		1000	100	30	15	10				
	IHL	A					4					
AB						90						
ABC						300						
2	WARRANTY	NO CLAIM	120	120	100	80	80	1	DESIGN CONCERN			
3	INTERNAL PPM PRESS	Scrap	BUILD %	0.5	0.3	0.2	0.15	0.2	0.0012			
		Rework	BUILD %	2.6	1.8	1.5	1.2	1.5	0.0062			
	INTERNAL PPM ASSY	Scrap	BUILD %	1.0	0.9	0.8	0.5	0.8	0.00072			
		Rework	BUILD %	0.5	0.5	0.4	0.3	0.4	0.00065			
4	SUPPLIER PPM	PPM	200	100	30	15	10	200 +	NOT ALL SUPPLIERS			
5	TQC (DAPS)	Press	NO	24	24	24	24	39 (1996)	NEW MODEL INTRO. DURING 1996 REDUCED NUMBER OF ONGOING PRESENTATIONS			
		Assy	NO	24	24	924	24					
		Eng	NO	8	8	6	6					
		Mat Han	NO	6	6	12	12					
		Admin	NO	24	24	24	24					
6	CONTROL SYSTEM	TYPE	Change Control Rework	Helmsman Stock Rec 98% SNP	BS5750 to ISO 9000	Planning System (Prodn)	Data Capture	All Achieved	DATA CAPTURE COMMENCED 1996			
7	PRODUCTIVITY IMPROVEMENT	%		10	10	10	Best Group	22%	11% MANPOWER REDUCTION + 11% VOLUME INCREASE			
8	PRESS EFFICIENCY % MAX SPM	TRF	1200	%	55	70.3	75.5	79.5	81.5	65%	PREVIOUS BEST 73%, NEW MODEL LAUNCH FLUCTUATES RESULTS MAJOR AREA FOR IMPROVEMENT	
			350	%	60	73	78.4	82.4	84	68.8%		
			200	%	39	55.5	60.6	63.8	65.6	72.2%		
		BLK	400	%	30	40.6	43.4	45.5	46.9	37.1%		
			200	%	37	50	53.5	56.1	57.8	37.4%		
			120	%	36	50	53	56	59	45%		
9	ASSEMBLY EFFICIENCY (MAN)	EC	%	70	80	90	95	97	83%			
		DC	%	70	80	90	95	97	85%			
		EQ	%	-	-	-	-	85	78%			
10	AUTOMATION ASSY	TOTAL	%	-	6	2	2	2	10			
11	DELIVERY SYSTEMS											
12	BODY SHOP SUPPLY	%					100%	95% +	ESTIMATED (NOT INCL NMUK PRESS)			
13	STOCKING POLICY	COIL	Off Site	DAYS	30	10	5	5	5	12 DAYS	STEEL USAGE INCR. TO 5000 TONNES/MTH LOCALISATION ACTIVITY WITH PARTS INC IN LOCAL SUPPLIERS	
			On Site	DAYS	4	2	1.5	1	1	TOTAL		
		KD	Off Site	DAYS	50	35	30	29	28	18.9 DAYS		
			On Site	HOURS	24	12	6	4	2	TOTAL		
		LOCAL PARTS	Parts	DAYS	5	3	2	1	1	3.3 DAYS		
			Press	HOURS	78	78	36	36	36	132 HOURS		5.5 DAYS
			Assy	HOURS	36	36	12	12	12	55.2 HOURS		2.3 DAYS
14	PROCESS UTILISATION	EC	%	68	70	72	72.5	-	95%			
		DC	%	66.5	69	71	72	72.5				
		EQ	%	-	-	-	-	69				
15	SUPPLIER RATIONALISATION	NO	550	320	-	-	-	320				
16	OVERHEADS - MANPOWER		552	556	524	509	500	495	RED IN MANPOWER (PERMANENT STAFF)			
17	SICKNESS	%	3	3	3	3	3	2.2%				
	LABOUR TURNOVER	%	5	5	5	5	5	1%				
	ACCIDENTS	%	3	3	2	2	1	2.5%	AUG 96 INC. HEAR MISS			

APPENDIX THREE

ANNUAL POLICY & TQC STEP UP SHEET

1996 MANAGEMENT POLICY

The EQ car launch is the activity for the entire company and without the successful launch of EQ, NYEL cannot claim any justification for its existence. Bearing this in mind, the following policy has been laid down.

1. Continue both the quality improvement activity and the productivity improvement activity utilising kaizen as the driving force.
2. Acknowledging that the EQ launch is of the utmost priority, then the whole company should combine its efforts to stabilise the EQ production as early as possible.
3. Promote comprehensive rationalisation in order to establish the company with a strong constitution, making it leaner and more cost competitive in the market.
4. The target amount of the rationalisation through productivity improvement and total cost reduction activity is 4 % of the total turnover, so as to ensure the early elimination of cumulative loss.

SLOGAN

Combining the wisdom of each employee, establish a leaner, wasteless company.

1996 MANAGEMENT TASKS AND TARGET

The main tasks and aims for 1996 are as follows :-

1. Early Launch of EQ Car

Target : Raise its productivity to the level of the existing model within two months after SOP.

Successful launch of new model in a short period of time relies on the early stabilisation of quality performance.

Also it is the close liaison among all departments at all levels, which enables such tasks as installing or productionising dies and facilities, or allocation and education of manpower in the shortest period of time and at the lowest possible cost.

The company must ensure that the advantage of present experience is reflected in the future models.

2. Reduction of total cost.

Target : Cost reduction by 4% of overall turnover.

Employ bold ideas to check all spending items and reduce total cost.
(Complete control of budget).

3. Effective utilisation of manpower.

Target : Reduce labour cost
: Reduce number of men to allow additional business to be accommodated without increasing headcount

Direct area :

Not only continue kaizen activity as it is but also add another dimension to kaizen activity in the Press Shop.

Operate more than one press at a time, decrease manpower requirement for palletising and quality check.

Assembly must carry out 'output control' and allocate its manpower more effectively in accordance with workload fluctuation. Also Assembly should decrease its manpower.

Semi-direct (Die/Facility Maintenance, Material Handling etc) :

Decrease manpower through improving such areas as skill levels, productivity, autonomous maintenance, material handling method within NYEL and line side delivery to NMUK.

In-Direct

Decrease manpower through such means as enlarging individual's responsibilities by improving skills and reducing control items.

4. Press

Eliminate downtime of large presses.
Target : 1200 TS TRF downtime percentage to be 11%/year (50% of 1995).

Elimination of downtime of 1200 TS TRF, will be achieved not only through improvements in quality, productivity and safety, but also by promotion of kaizen in dies, ancillary equipment, machinery and management to gain customer confidence in NYEL's delivery.

5. Overall activity targets

Customer concerns	10 PPM
Productivity Improvement	10%
Failed Delivery	0 cases
Accidents	10 cases
Rationalisation	4% of turnover

1996 MANAGEMENT POLICY

The launch of EQ car will be prime objective for 1996.

Achieving high levels of quality and productivity is paramount to the company business.

1. Early stabilisation of EQ.
2. Improvement in quality throughout :
 - a) In process
 - b) In people
3. Prepare company for replacement models (including service parts).
4. Prepare company for leaner production.
5. Kaizen activity promotion (using philosophies of T.Q.C.)
6. Plan Do-Check-Action to be adopted for all activities with more control.

MANAGEMENT TARGETS

1.	Ordinary profit rate	6%
2.	Customer Concern Rate	10 PPM
3.	Short Deliveries	Zero
4.	Productivity Improvement	10%
5.	Rationalisation of Turnover	4%

1996 OBJECTIVES

1) QUALITY

- o Drive improvement as weld failure X-functionally.

2) COST

- o Drive press improvements through downtime awareness (X-functionally).
- o Assy Kaizen (minimum temp.)
(quick kaizen EQ)
- o Material Utilisation
 - 1) EQ blank size reduction
 - 2) Use of scrap at suppliers
- o Automation ----> investment cost
- o Resource to other suppliers
- o Part X part monitor
 - * Material
 - * Productivity

FOR PRESS & ASSY

- o Assy checking system/method
- o Localisation Steel/Parts

3) LAYOUT

- o No press store
- o Spotweld by 120 BLK
- o Space upwards

4) OTHERS

1. Review responsibility/structure for new model
2. Design capability
3. WEQ/M Model Launch/Trial/Plan/EC Service
4. Develop press part suppliers
5. N.V.Q. development of people
6. Aluminium Trials

TQC STEP UP SHEET

ACTIVITY PLAN	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	WHO
POLICY	⊕						H IIDA
CURRENT CONDITION							B COBB
COUNTERMEASURES							B COBB/MGR
ACTIVITY PLANS) MGRS
CASCADE THROUGH)
APPRAISALS							TOTAL CO.
SUPERVISION BRIEF							MANAGERS
PLANT BRIEF							B COBB
MONITOR (MONTHLY)							H IIDA

	BG (1996)													
	94.AV	95.AV	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TARGETS														
PLANT PPM	314	28	50	45	40	35	30	30	25	20	20	15	10	10
ACTUAL	305	118												
INTERNAL PPM	7637	3950	5000	4500	4000	3500	3000	3000	3000	2500	2500	2000	2000	2000
ACTUAL	7848	7749												
INT. OCCURRENCE	142	114	100	80	75	70	55	50	45	40	35	30	25	20
ACTUAL	156	163												
CUS OCCURRENCE	56	27	40	30	25	22	20	20	20	20	15	15	10	10
ACTUAL	54	49												
1200 TRF NO. 1	66.3	78	65	67	69	72	75	76	76	77	79	80	80	80
ACTUAL	66.7	61												
1200 TRF NO. 2	67.5	78	70	72	73	74	75	76	76	77	79	80	80	80
ACTUAL	66.6	65												
1200 TRF NO. 3	72.1	78	70	72	73	74	75	76	76	77	79	80	80	80
ACTUAL	70.4	64												
350 TRF NO. 1 & 2	78.64	83	75	76	77	79	80	80	81	81	82	83	84	85
ACTUAL	78.8	74												
200 TRF NO. 1 & 2	65.9	69	67	68	69	69	69	70	70	71	71	71	72	72
ACTUAL	66.4	66												
400 BL NO. 1	37.1	42	35	36	39	40	40	41	42	43	43	44	45	46
ACTUAL	37.1	34												
400 BL NO. 2	37.1	42	38	39	40	41	42	43	44	44	45	46	47	48
ACTUAL	37.1	37												
200 BL NO. 1 & 2	44.36	54	44	45	46	47	48	49	50	51	52	53	54	55
ACTUAL	44.3	43												
120 BL NO. 1 & 2	50.9	54	45	46	47	48	49	50	51	52	53	54	55	56
ACTUAL	47.3	45												
EC & DC	65	77	79	79	80	81	81	82	83	83	83	84	84	85
ACTUAL	73	78												

1) **THEME**
1996 ACTIVITY PLAN (BG96)
FOR QUALITY, COST & DELIVERY

2) **REASON**
NYEL REQUIRÉ TO IMPROVE BUSINESS IN QUALITY & COST TO ACHIEVE PROFIT & ALLEVIATE ACCUMULATIVE LOSS. IN ADDITION, A NEW MODEL IS LAUNCHED AND WE MUST UNDERSTAND PREVIOUS CONCERNS TO ENSURE THAT RE-OCCURRENCE DOES NOT HAPPEN.

3) **TARGET**
1996 MANAGEMENT POLICY
The launch of EQ car will be prime objective for 1996.
Achieving high levels of quality & productivity is paramount to the company business.

- 1) Early stabilisation of EQ
- 2) Improvement in quality throughout :
 - a) In process
 - b) In people
- 3) Prepare company for replacement models (including service parts)
- 4) Prepare company for leaner production
- 5) Kaizen activity promotion (using philosophies of T.Q.C.)
- 6) Plan Do-Check-Action to be adopted for all activities with more control

MANAGEMENT TARGETS

- 1) Ordinary profit rate 6%
- 2) Customer Concern Rate 10 PPM
- 3) Short Deliveries Zero
- 4) Productivity Improvement 10%
- 5) Rationalisation of Turnover 4%

TQC STEP UP SHEET



**CURRENT SITUATION
PRODUCTION ENGINEERING POLICY (RESULTS)
CUSTOMER**

(NISSAN)

	THIRD QUARTER		
	1994	1995 TARGET	ACTUAL
Q	69	80	86.52
C	67.8	70	62.22
D	95.8	97	97.04
D	56	60	59.52
M	66.2	70	60.25

QUALITY

AREA	1994	1995 TARGET	ACTUAL
CUSTOMER PPM	307	10	AVG. 118.2 (BEST 33)
INTERNAL PPM	8700	3000	AVG. 7749 (BEST 4826)
PRESS	4300	1800	7672 (BEST 5773)
ASSY	3400	1200	3872 (BEST 2599)

COST

	1994	1995 TARGET	1995 ACTUAL
MATERIAL UTILISATION	64.74%	69%	65.12% (BEST 66.78)
PRESS EFFICIENCY	71%	80%	66.43%
TRF AVG	44.80%	53%	40.05%
BLK AVG			
ASSY EFFICIENCY	67%	76%	78.08%

DELIVERY CONCERNS

	1994	1995 PLAN	1995 ACTUAL
CUSTOMER STOPS	*	Zero	Zero
SHORTAGES IN STOCK	*	*	Av/Mth 54* Occurrences

* New Data

SAFETY

	1994	1995 PLAN	1995 ACTUAL
ACCIDENTS	345*	REPORTABLE 20 (296)*	REPORTABLE 10 # 270#

Data Jan - Sept
* All accidents major & minor

TQC STEP UP SHEET



CURRENT SITUATION PRESS (1200 TRF)

	1994	1995
INCORRECT FORM	54	55
SPLITS	27	28
TRIM ±	26	30

DATA JAN - OCT DATA JAN - SEP

ACTIVITY

- o ZERO PROCESS CONCERN PART MEETING
- o DIE CHECK (NO. OF DEFECTS MORE THAN 100/LOT)
- o FIRST/MIDDLE/LAST - STRENGTHEN CONTROL
- o NEXT DAY/RUN CHECK OFF PARTS
- o PROCESS ANALYSIS RE-OCCURRENCE

6% DETERIORATION → NOT EFFECTIVE

ASSY

	1994	1995
MISSING PARTS	111	48
DIMENSIONAL ACCURACY	87	46
WELD FAILURE	53	8

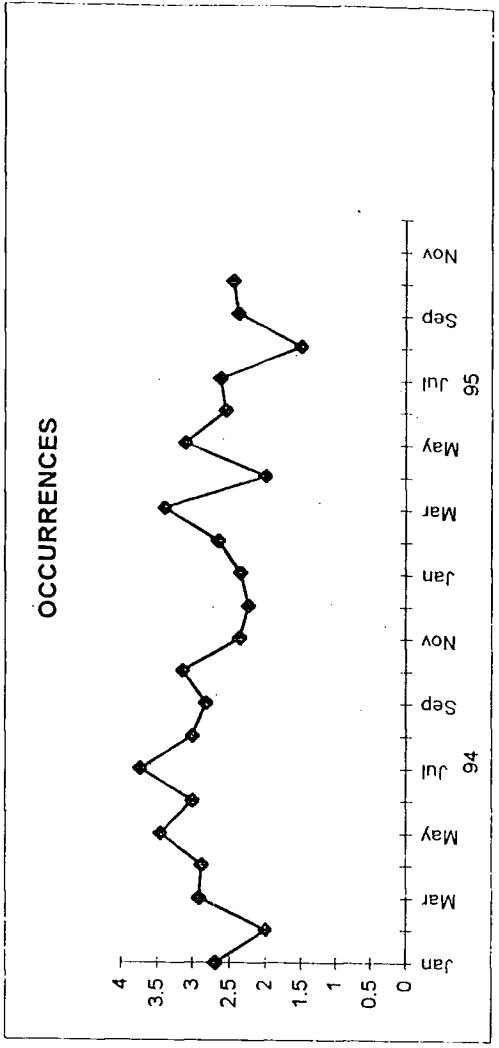
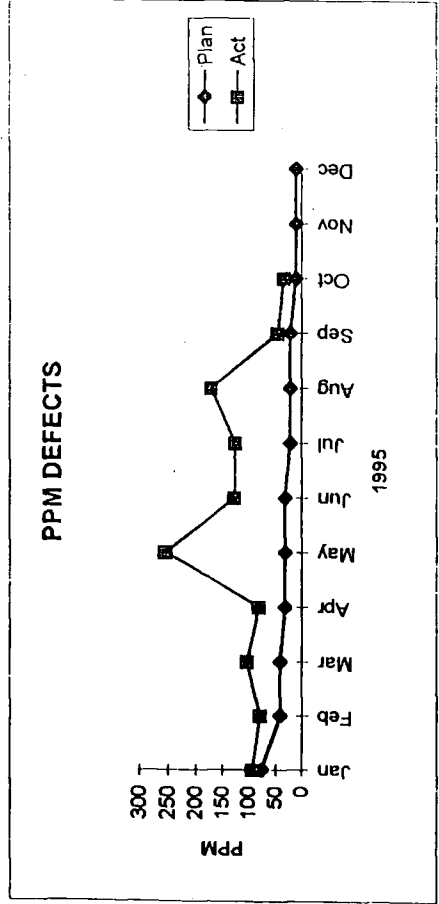
DATA JAN - OCT DATA JAN - SEP

ACTIVITY

- o CROSS FUNCTIONAL WELD FAILURE ACTIVITY
- o CROSS FUNCTIONAL PROBLEM/COUNTERMEASURE ACTIVITY DAILY AT CELL
- o MAJOR 5S' ACTIVITY

RESULT

60% IMPROVEMENT → EFFECTIVE



TQC STEP UP SHEET

COSTS

MATERIAL UTILISATION	1994	1995
JANUARY	67.35	62.51
FEBRUARY	63.38	64.66
MARCH	64.00	65.4
APRIL	63.68	65.49
MAY	67.05	63.48
JUNE	64.06	66.26
JULY	64.12	66.5
AUGUST	66.70	65.0
SEPTEMBER	63.86	66.78
OCTOBER	-65.13	-
NOVEMBER	-62.85	-
DECEMBER		
AVERAGE	64.91	65.12

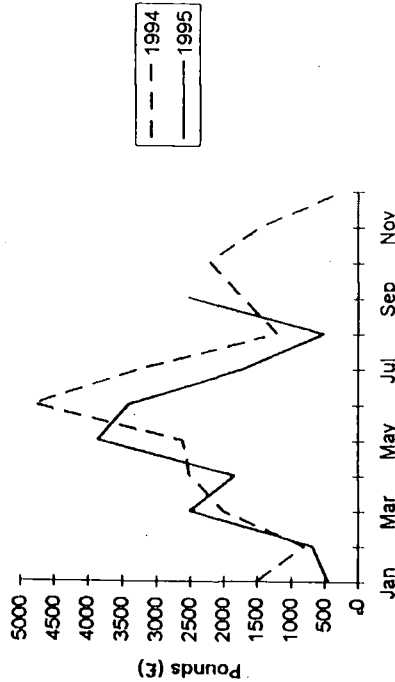
ACTION

- o SCRAP, REWORK REDUCTION
- o COIL TIP END UTILISATION
- o BLANK PITCH/WIDTH REDUCTION
- o TEAR DOWN FREQUENCY
- o NON DESTRUCTIVE METHODS

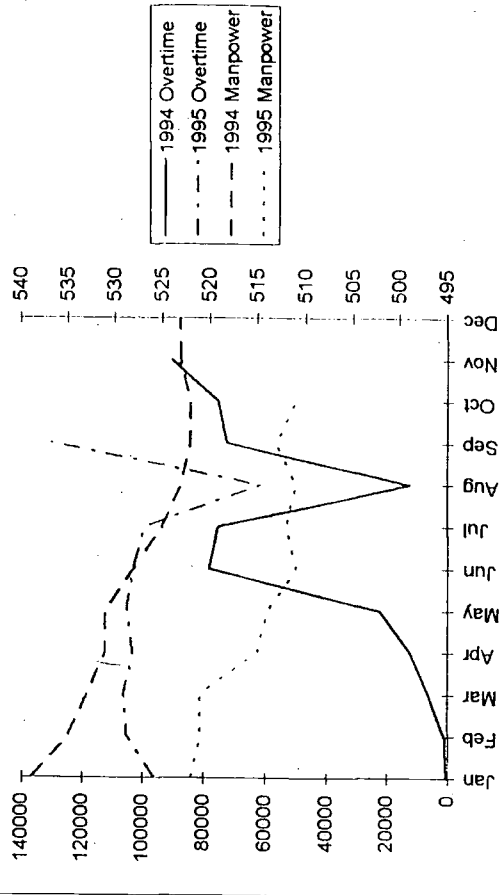
RESULT

- o 0.33% IMPROVEMENT
- o NOT EFFECTIVE

COST AT CUSTOMER



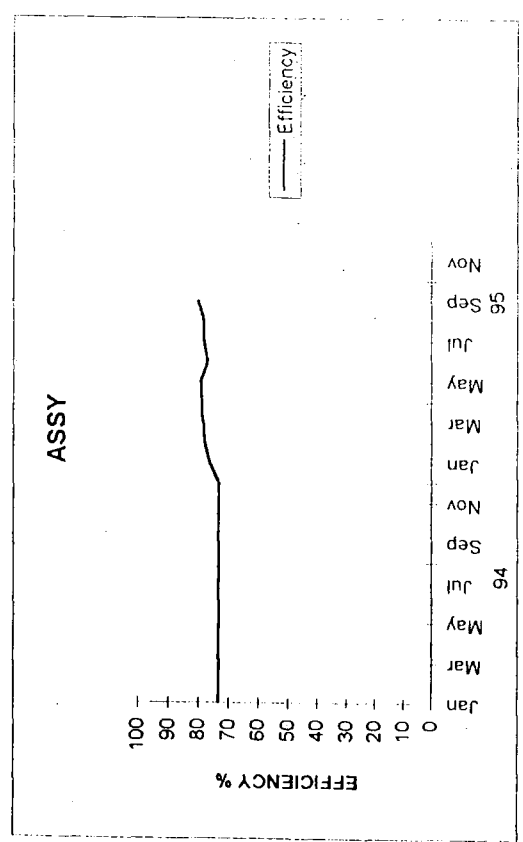
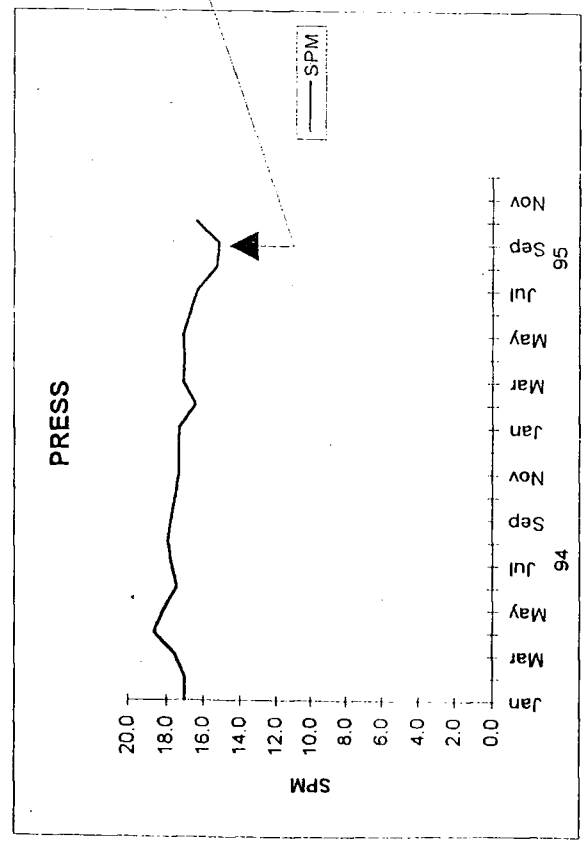
ALTHOUGH MAJOR
IMPROVEMENT IN PPM
ONLY MARGINAL
IMPROVEMENT AT
OFF SITE ACTIVITY



TQC STEP UP SHEET



COST (CONTINUED)



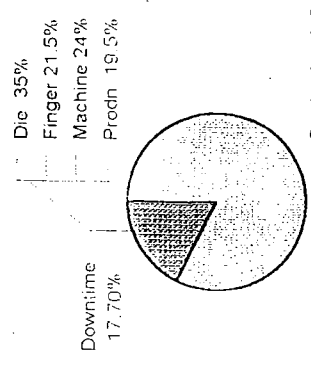
ACTIVITY

- o MACHINE PM'S
- o DIE CHECK LOW SPM
- o DOWNTIME ANALYSIS
- o PRESS CHECKS
- o PALLETISER MAKING

NOT EFFECTIVE

DOWNTIME

1994 (Jan - Oct)



Production & Die Change

82.30%

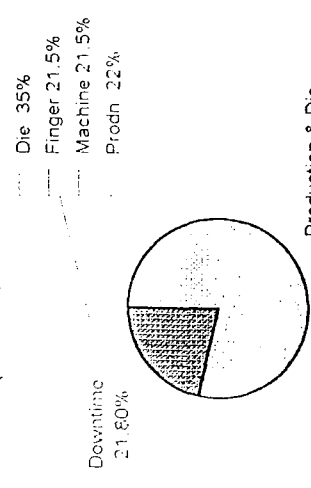
ACTIVITY

- o ESTABLISH MEASUREMENT SYSTEM
- o VISUAL CONTROLS/OWNERSHIP
- o DOWNTIME SYSTEM
- o KAIZEN
- o EFFICIENCY MEETINGS
- o ROBOT SPEED
- o TQC (ALL LEVELS)

EFFECTIVE

KAIZEN MEETING STARTS

1995 (Jan - Oct)



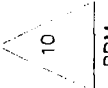
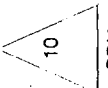
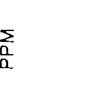
Production & Die Change

78.20%



TQC STEP UP SHEET

ACTIVITY PLAN
QUALITY

TARGET	ITEM	GRAHAM FLEMING	KIMURA MACKAY CRUDDACE	MORI	CAMBROOK	GRAY	HATA	COBB	ACTIVITIES
 10 PPM	WELD FAILURE	<input type="radio"/>			<input checked="" type="radio"/>	<input type="radio"/>			<input type="radio"/> MAINTAIN X-FUNCTION METHOD <input type="radio"/> CASCADE TO ALL STAFF OWNERSHIP <input type="radio"/> SET TARGET FOR 1996
	PARTS MISSING	<input checked="" type="radio"/>		<input type="radio"/>		<input type="radio"/>			<input type="radio"/> ESTABLISH ACTIVITY PLAN <input type="radio"/> CASCADE TO ALL LEVELS AS PART OF APPRAISALS
	INCORRECT ASSY	<input checked="" type="radio"/>		<input type="radio"/>		<input type="radio"/>			<input type="radio"/> ESTABLISH ACTIVITY PLAN <input type="radio"/> CASCADE TO ALL LEVELS AS PART OF APPRAISALS
 10 PPM	SPATTER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>			<input type="radio"/> COLLECT DATA. ESTABLISH TARGET <input type="radio"/> FORMAT CROSS FUNCTIONAL ACTIVITY
	NEW MODEL CONTROL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/> ESTABLISH STRUCTURE AND ROLES OF RELEVANT DEPARTMENT
	SPLITS		<input checked="" type="radio"/>						<input type="radio"/> MAINTAIN DRAW CONDITION <input type="radio"/> ENSURE MATCHING OF SUBSEQUENT DIES
	FORM ERRORS		<input checked="" type="radio"/>			<input type="radio"/>			<input type="radio"/> REGULAR CLINICS TO MONITOR DETERIORATION OF PARTS
	BURRS		<input checked="" type="radio"/>						<input type="radio"/> CRITICAL PART ANALYSIS
 10 PPM	DIE REFURBISH PLAN		<input checked="" type="radio"/>			<input type="radio"/>	<input type="radio"/>		<input type="radio"/> MAINTAIN REFURBISH PLAN ON CRITICAL PARTS
	PROCESS (SETTING) CONTROLS		<input checked="" type="radio"/>						<input type="radio"/> SETTING OF PRESS DATA NOT FORMALISED
	OPEN DIE POLICY (COUNTERMEASURE)		<input checked="" type="radio"/>			<input type="radio"/>	<input type="radio"/>		<input type="radio"/> FOR QUALITY CONCERNS ESTABLISH OPEN DIE POLICY WITH CROSS FUNCTIONAL COUNTERMEASURE ACTIVITY

A S S Y

P R E S S

APPENDIX FOUR

ENGINEERING DEPARTMENT'S ANNUAL POLICY & SUPPORTING DOCUMENTATION

STEP 1 - THEME

Establish Activity Plans to Achieve
Company Policy in Q.C.D.M.S. for 1997

POLICY 1997

- Profit Rate 7%
- Customer Defect 5 PPM
- Delivery Zero Missed
- Productivity 10%
- Safety Zero Accidents
- TCRA 5 % of Turnover

- o Smooth Launch of New Products
- o Maintain TQC Development of Staff

TIMING PLAN

Current Situation
Objectives
Brief Engineering
Dept. Plans
Individual Plans

October	November	December	January
██████████	⊕	██████████	↑

TARGETS/OBJECTIVES

TARGETS/OBJECTIVES	Int.		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	PPM	Ext.	4000	3800	3600	3400	3200	3000	3000	2800	2500	2250	2100	2000
1) QUALITY IMPROVE			40	35	35	30	30	30	25	25	15	10	10	5
	Daily OCC	Ext.	3	3	3	3	3	2	2	2	2	1	1	1
	Machine Eff.	Int.	65%	67%	69%	70%	72%	74%	75%	76%	77%	78%	79%	80%
2) COST	Assy		81%	82%	82%	83%	83%	84%	84%	85%	86%	87%	87%	88%
	Rework %/Co.		5	4	4	4	3	3	3	2	2	2	1	1
3) NEW MODEL LAUNCH	Die		Trials		USA	Trial					T1		SOP	
	Press		Trial			E2				↑				T1
4) SHOP FLOOR AUTOMATIC DATA TRANSFER	Assy		Trial							↑				
5) INTRODUCTION TO CAD/CAM			Develop							↑				
6) INCREASE SUPPLIER BASE			↓							↑				
7) IN-HOUSE PROTOTYPE PREP.			↓							↑				↑

ENGINEERING

- Press**
- Pursue both easy-to-produce process & new processing method
 - Early stabilisation of newly launched parts - carry out kaizen and follow-up activities for concern items by co-ordinating with other depts.
 - Develop part (product) manufacturing know-how
 - Timely completion of tuning of tools (reduce forming concerns)

Assembly

- Expedite E-plan.
- Support SD Activity
- Countermeasures for current model's problems
- Preparation of ~~██████~~ and ~~██████~~ (Manufacture high efficiency cells)
- Improve facility reliability (reduce machine downtime)
- Promote smaller cells
- Increase & establish in-house jig making capability

Quality

- Improve standard of Pre-Production quality assurance activity (Establish quality before volume production)
 - Satisfy customer's quality requirement as early as possible
 - Prioritise quality improvement during T1 & T2 stages
- Reduce quality concern of volume production parts (quality built in process)
 - Reduce process quality concerns
 - Reduce customer quality concerns
- Reinforce goods-in quality checks (quality of purchased items)

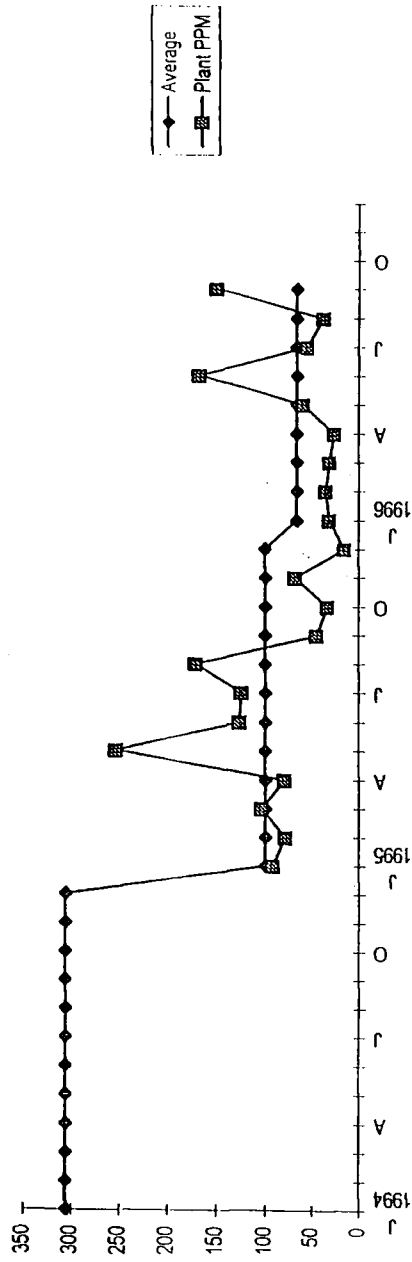
(1) Ball park figures open to negotiation with next level managers

1996 ACTIVITY

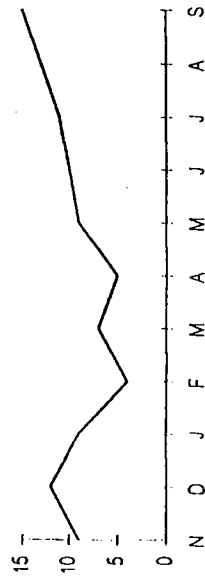
Focus	Assy	Press
Weld Failure		Splits
Parts Missing		Form Errors
Spatter		Burrs
Incorrect Assy		Process Control
New Model Control		Countermeasure Activity

Cross Functional Activity Cascade

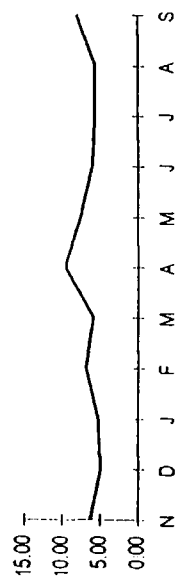
PLANT PPM



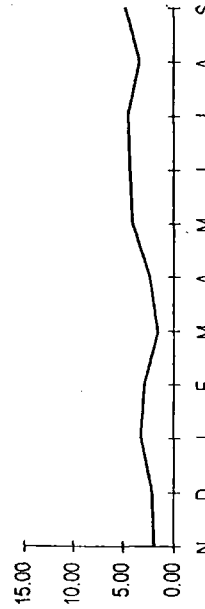
RE-OCCURRENCES



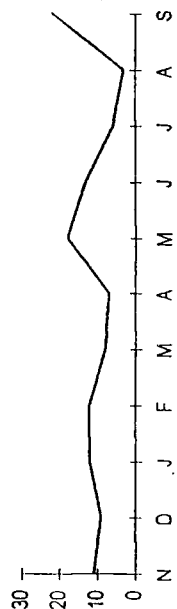
INTERNAL



CUSTOMER OCCURRENCE



SUPPLIER/OTHERS



RESULT

PPM	94	95	96 (to date)
	304	99	65
			34% imp.

RE-OCCURRENCE

Deterioration at New Model Launch (Not Necessarily New Model Parts)

CUSTOMER OCCURRENCE

Deterioration at New Model Launch
85% Assy 1 Off Concerns
67% Press 1 Off Concerns

INTERNAL OCCURRENCES

Stable no improvement.

SUPPLIERS

Sporadic, major concerns with majority re-occurrence

GENERAL

No Improvement in Occurrences (PPM only improved) Large Amount of 1 off Incidents

CURRENT SITUATION QUALITY

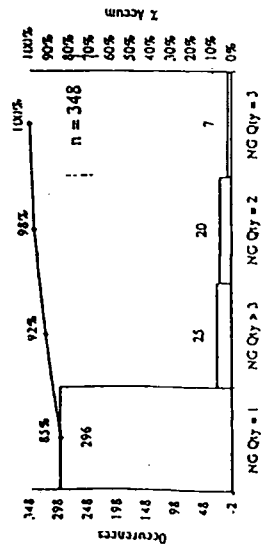
Customer Concern Analysis 1996

Main Production Areas Analysis

Assembly Analysis by NG Qty per NCMAR

NG Qty	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Sub Totals
1	30	27	13	17	41	49	42	31	40				296
2	5	3	1	2	1	1	1	1	3				20
3	2	1	2	0	1	1	0	0	0				7
>3	3	2	2	1	4	6	2	1	5				25
Totals=>	40	35	17	21	50	57	45	33	48				348

Categorization of NG Qty's Assembly

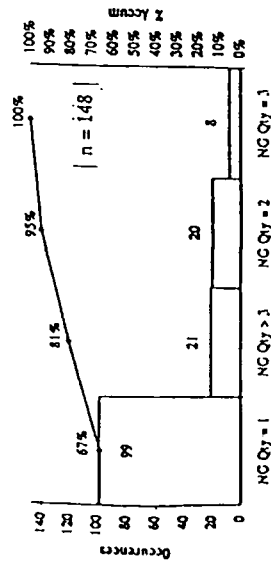


Press

Analysis by NG Qty per NCMAR

NG Qty	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Sub Totals
1	9	4	4	13	14	16	20	6	11				99
2	2	2	1	2	1	2	3	0	3				20
3	1	0	0	0	3	1	0	2	0				8
>3	2	1	1	0	6	2	2	2	5				21
Totals=>	14	8	6	17	24	21	27	10	21				148

Categorization of NG Qty's Assembly



MAIN AREAS TARGETED 1996

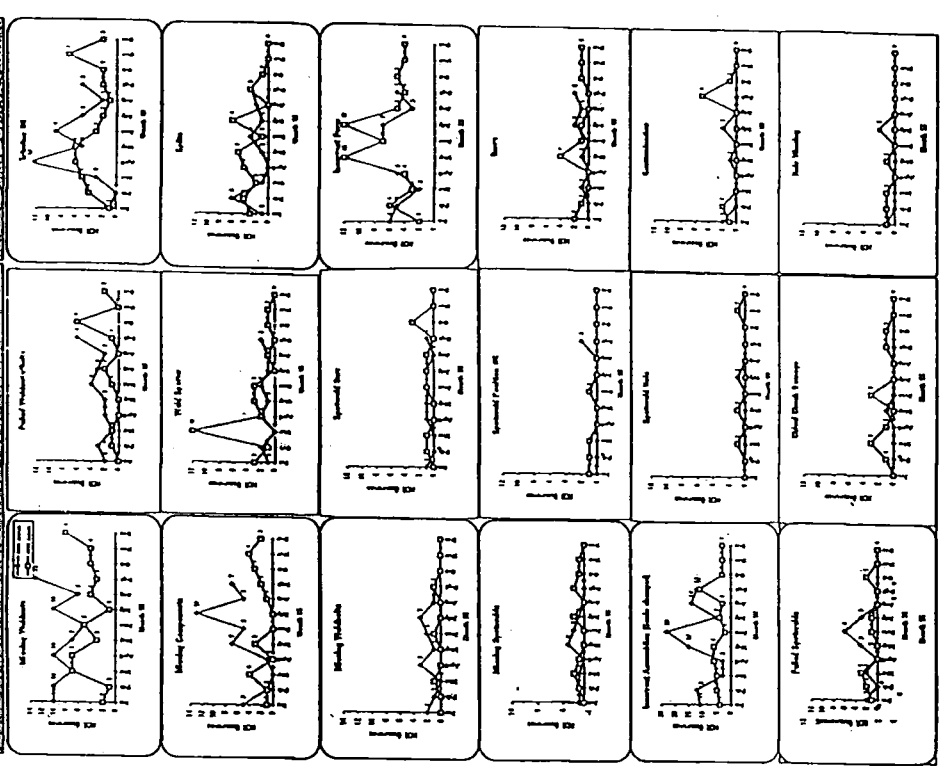
- 1) Missing Parts (nuts etc)
- 2) Incorrect Assemblies
- 3) Failed Spot Welds
- 4) Failed Mig Welds
- 5) Splits

RESULT

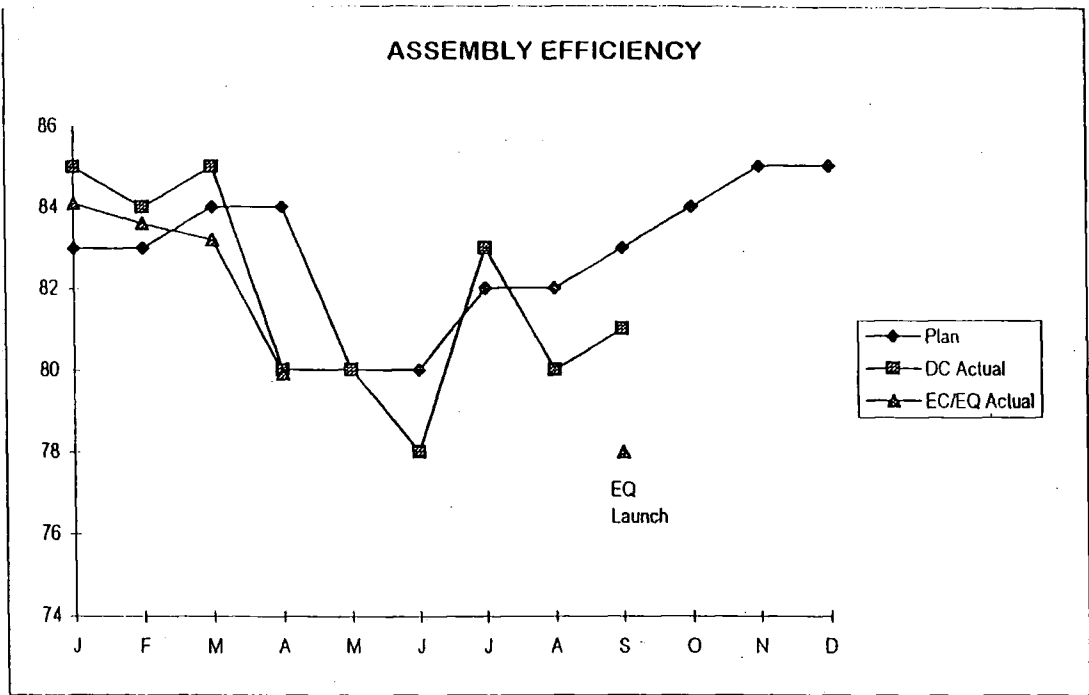
- 6) Incorrect Form
- 7) Trim Line N.G.
- 8) Control of New Materials
- 9) Control of Rework
- 10) Carry Over Parts to New Model



Decrease in high volume of defect arriving at customer. No major improvement in number of concerns or type of concern reduction.



ASSEMBLY



EQ ASSY

	TACT TIME ACHIEVEMENT			
	SOP + 180	SOP + 90	SOP PLAN	ACTUAL
ROBOT CELL	100%	85%	70%	91%
OTHERS	100%	85%	70%	93%

EQ LAUNCH

Good activity regarding delivery & trials from Japan.

Poor control of trials using carry over facilities from EC (Temp process required, facilities not available at SOP)

Activity regarding new in-house facility developing well

REWORK

High level of rework following late change requests prior to SOP

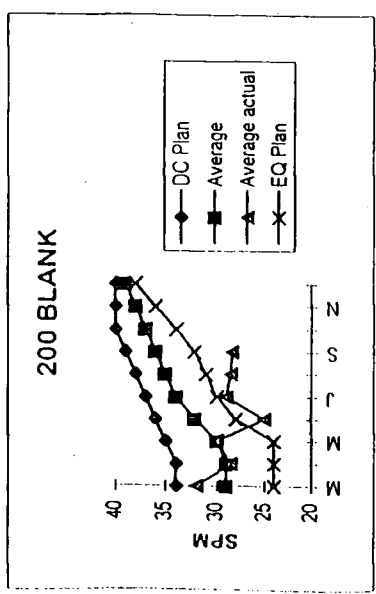
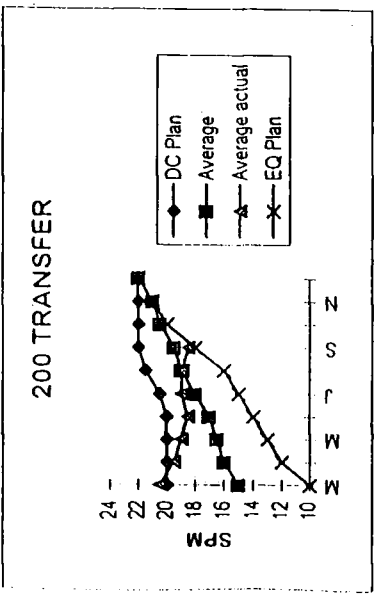
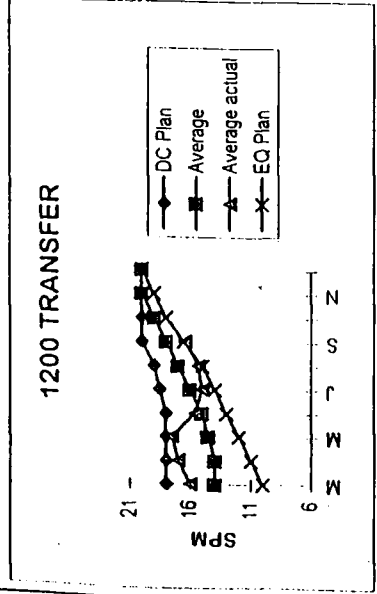
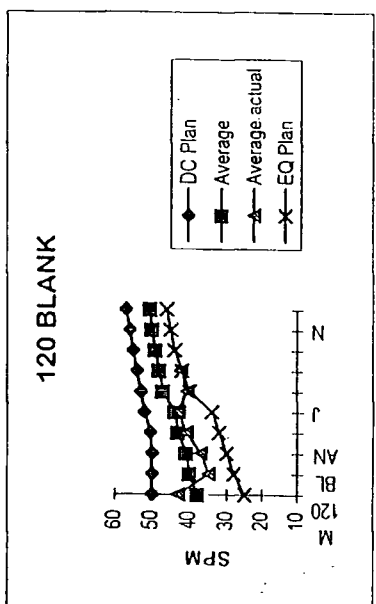
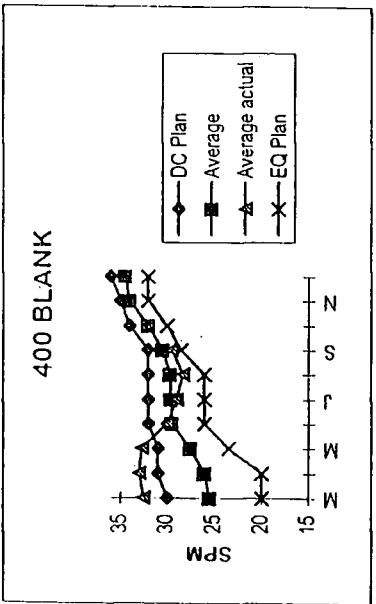
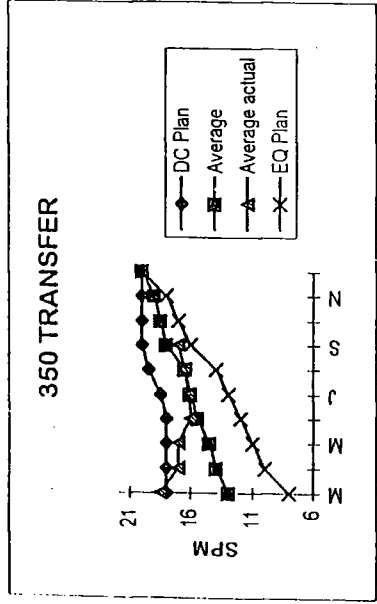
SPACE SAVING

Good activity on space generation
No expansion for new model

PRESS	HANDOVER			SET SPM	
	SOP + 180	SOP + 90	ACTUAL	PLAN	ACTUAL
1200 TRF	100%	85%	82%	21.2	23.1
350 TRF	100%	85%	85%	22.18	22.6
200 TRF	100%	85%	74%	25.6	27.4
400 BLK	100%	85%	94%	46.5	51.4
200 BLK	100%	85%	94%	44.2	45
120 BLK	100%	85%	89%	55	59.6
TOTAL	100%	85%	86.30%		

Press performance SPM better than plan.

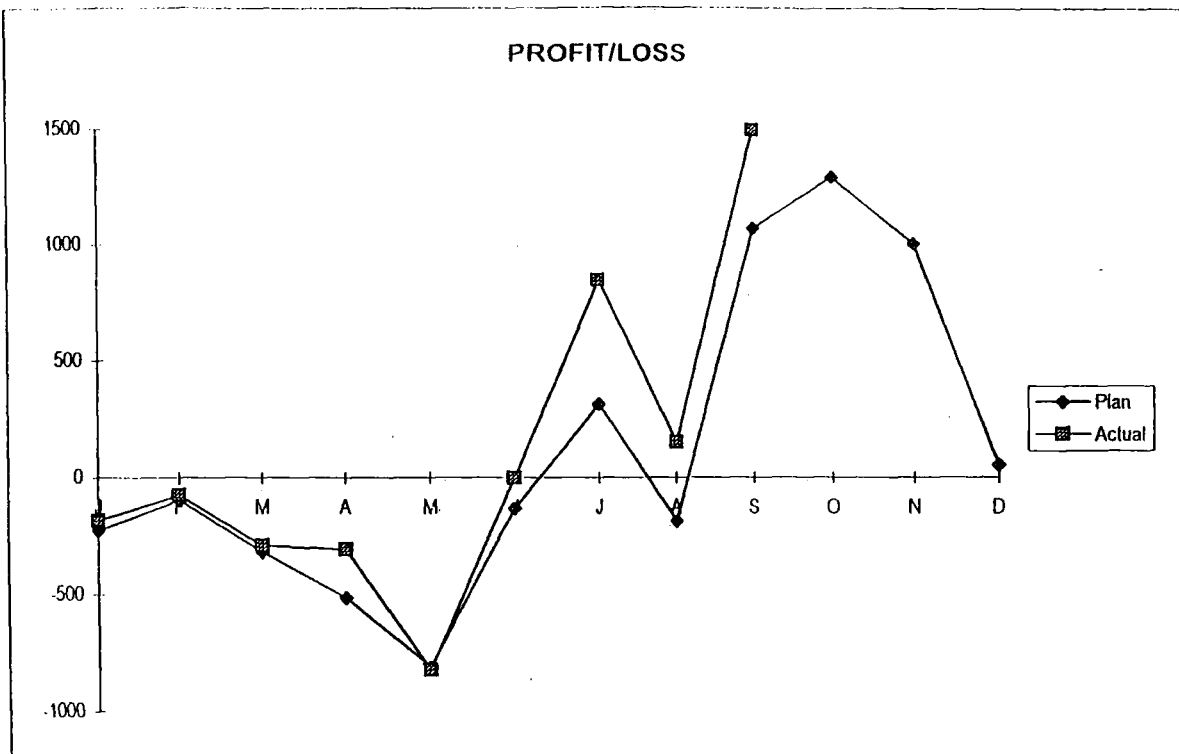
Not implementing permanent "engineered" countermeasures. Good development of component not die (productivity).



EQ LAUNCH

DIE CONCERNS

COST REDUCTION



TCRA

Material Improvement in material price & EQ size Plan v Actual.

Manpower Engineering improvement in fact time (plan V actual) & new Assy method = 16.5 men.

Others Total TCRA to date = £680K.
Projected for 1996 £1.5 million.

Remarks Largely due to volume increases and rationalisation of labour, yen rate, interest rate & steel price
Ratifying Plan v Actual quotation information rather than actual plan-do-check-action activity.
Savings in not contracting out EQ installation and unpacking accounted for percentage of costs.

- Areas of Waste**
- o High rework costs and control of rework.
 - o Support to NMUK in stock checking and acceptance of concern, e.g. Eng. Mtg. Brkt/Guard Bars
 - o Quality check methods and production of scrap.
 - o High cost in Die Maintenance, re-occurring concerns. No route cause analysis at Engineering level.

ENGINEERING POLICY

QUALITY

		B.C.			
		A.G.	E.C.	T.H.	OTHERS
Assy	Analysis of all customer concerns and ratification of NCR reply	●			
1					
2	Jig Maintenance "quality" schedule	●	○		Jig Maintenance
3	Weld "failure" activity to control weld conditions	○	●		Maintenance Production Quality
4	Missing Part Activity Nuts Bolts Parts	●			Production
5	Incorrect Assy audit inspection	●			
6	Line Stop quality defect control	●			Production
7	Scrap Analysis	●	○		Production
8	Rework method location	●			Production
Press	Countermeasure activity for continual concern (Rework & non conformance)	●		○	Production
1					
2	Die Maintenance "clean & check" activity part by part timing plan based on : 1) No strokes 2) Material Type 3) Quality Issues	●			Die Maintenance
3	Burr Analysis Reduction	●		○	Die Maintenance
4	Splits (material analysis activity)	●			Production Control
5	Rework Method Location	●			Production
Supplier	Rework reduction activity	●		○	
1					
2	Incoming goods confirmation	●			
3	Supplier NCR reduction	●			
4	Supplier System Improvement	●			Purchase

COST

		B.C.			
		A.G.	E.C.	T.H.	OTHERS
1	Reduction in response to customer activity	●			
2	Rework reduction	●	○	○	Die/Jig Maint.
3	SPM Up Activity		○	●	
4	Overtime Rationalisation	●	●	●	
5	Assy Automation (Low Cost)		●		
6	Press Automation (Low Cost)		○		Production
7	New Model Trial Time		●	●	Prod. Control
8	Material Revisions a) Size b) Spec			●	Prod. Control Purchase
9	Automatic Data Transfer a) Press b) Assy		●		Production/ Prod. Control
10	Facility Downtime Reduction		●		Production Maintenance

NEW PROJECTS

		B.C.			
		A.G.	E.C.	T.H.	OTHERS
1	Minimise Investment in Capital Equipt.		●		
2	Cost Reduction in Vendor Tooling (In-house where practical)		●	●	
3	Timely tooling arrival and trial planning		●	●	
4	Target Setting for Handover Press Assy	●	●	●	
5	Dictate Trials	●	●	●	Prod. Control
6	Handover Good Die & Jig with advice and development of Production Staff		●	●	Production
7	Plan-Do-Action Activity Throughout	●	●	●	Production/ Maintenance
8	F.M.E.A. to be utilised at planning stage	●	○	○	
9	Handwork Control/Car	●			
OTHERS					
1	Increase supplier base	●		●	Purchase
2	Develop CAD/CAM system	○	○	●	ISD
3	Promote Prototype Part Manufacture in-house	●		○	
4	Service Capacity Study		●		Maintenance
5	Material Handling Reduction		●		Material Handling Production
6	S.D.T. Activity Support	○	○		Production
7.	φS 9000 IMPROVEMENT	⊙	○	○	Acc.

APPENDIX FIVE

DEPARTMENTAL ACTIVITY SCHEDULES & ASSOCIATED REVIEW DOCUMENTS

ASSEMBLY DEPARTMENT SCHEDULE 1996 (ASSEMBLY DEPARTMENT)

ACTIVITY	MAJOR TASKS	METHOD	OCPPM	OCPPM	TARGET	NO.	PPM	J	F	M	A	M	J	J	A	S	O	N	D	ACTION	CONTROL POINT						
			1994	1995																							
QUALITY	EXTERNAL QUALITY	i) MISSING COMPONENT ANALYSIS PART BY PART INVESTIGATION TO HIGHLIGHT TRENDS CLUSTER POINTS ii) CONTINUE WELD FAILURE PROJECT iii) INCORRECT ASSEMBLY ANALYSIS BY ALLOCATED SM- COUNTERMEAS- SURE APPROVAL iv) SPATTER INIATIVE AS PART OF CROSS FUNCTIONAL ACTIVITY v) DAILY OPERATIONAL RESPONSE MEETING vi) POKE YOKE ANALYSIS	29/307	21/39																	P.L.S.S	PLAN (OCC) X NO. WORK D.					
			29/307	21/39																				TOTAL REJECT X 1000000			
			29/307	21/39																				TOTAL PARTS SHIPPED			
			29/307	21/39																							
			29/307	21/39																							
			29/307	21/39																							
			29/307	21/39																							
			29/307	21/39																							
			29/307	21/39																							
			29/307	21/39																							
QUALITY	INTERNAL QUALITY	i) ASSESSMENT QUALITY SYSTEM PPM ii) IDENTIFY HIGHEST PPM PART NO. iii) HISTORICAL DATA iv) CHECK METHOD N.D.T v) CONTINUE WELD FAILURE STRATE- GY vi) TRAINING OF TEMPORARY STAFF vii) ISO 9002 PROCEDURES FOR E.Q viii) POKE YOKE ANALYSIS HIGHLIGHT REQUIREMENTS SCHEDULE ACTIVITY	48/7428	15/3714																			PLAN (OCC) X NO. WORK D.				
			48/7428	15/3714																				TOTAL REJECT X 1000000			
			48/7428	15/3714																					TOTAL PARTS		
			48/7428	15/3714																							
			48/7428	15/3714																							
			48/7428	15/3714																							
			48/7428	15/3714																							
			48/7428	15/3714																							
			48/7428	15/3714																							
			48/7428	15/3714																							
COST	EFFICIENCY	i) MAINTAIN E.C EFFICIENCY (JAN-MAY) ii) INCREASE D.C EFFICIENCY IN LINE WITH TARGET iii) RAPID INCREASE OF E.Q EFF iv) SET ADDITIONAL MEASUREMENT SYSTEM E.G. Parts Per Man Spots Per Man	67%	77%																			ACTUAL APH X 100				
			67%	77%																				PLANNED APH			
			67%	77%																							
			67%	77%																							
			67%	77%																							
			67%	77%																							
			67%	77%																							
			67%	77%																							
			67%	77%																							
			67%	77%																							
COST	OVERTIME REDUCTION	i) ALLOCATE BUDGETS PER SEC / MANAGER ii) MONTHLY VARIANCE REPORT A) UTILISATION O/T B) MANPOWER O/T iii) MAINTAIN PROGRESSIVE O/T iv) SET BUDGET REDUCTION TAR- GET.	29380	29380																			BUDGET ALLOCATION				
			29380	29380																					V		
			29380	29380																					ACTUAL SPEND		
			29380	29380																							
			29380	29380																							
			29380	29380																							
			29380	29380																							
			29380	29380																							
			29380	29380																							
			29380	29380																							

THIS IS A METHOD FOR TQM

DEPARTMENT OF DEFENSE																								
ACTIVITY	MAJOR TASKS	METHOD	1994	1995	TARGET	J	F	M	A	M	J	J	A	S	O	N	D	ACTION	CONTROL POINT					
					PRD	PRD																		
PROJECT SCHEDULING & DOWNTIME SYSTEM	(i) CONFIRM NEW SYSTEM FORMAT (ii) AID SOFTWARE DESIGN (iii) ALLOCATE PILOT LINE FOR TRIAL PURPOSES (iv) DESIGN TRAINING PACK (v) IMPLEMENT SYSTEM	(i) CORE TEAM TO BE SET UP TO AGREE FORMATS (ii) FORMAT SCHEDULES TO REQUIRED FORMAT E.G TIME PER SNP ROBOT TIMES (iii) ANALYSE FEEDBACK REVIEW (iv) INSTRUCT TEAM LEADER/SEC MAN ON USE OF SYSTEM																	SS	PROJECT MEETING ACTION MONITORING				
																						SS		
																							SS	
																							SS	
PROJECT E.C. SERVICE	(i) IDENTIFY SERVICE AREA (ii) IDENTIFY LAYOUT REQ' (iii) PRODUCE AREA FOR SERVICE PRODUCTION (iv) AGREE SCHEDULE FORMAT	(i) DRAFT FINAL SHOPFLOOR LAYOUT (ii) IDENTIFY .PART NO.S (iii) CLARIFY SERVICES REQ... (iv) ALLOCATE STORAGE OF JIGS (v) POSITION FACILITIES (vi) ENSURE ALL PAPERWORK IS TRANSFERRED, AND ANY NEW IS DESIGNED																			D.M	PROJECT MEETING ACTION MONITORING		
																							D.M	
																								D.M
																								D.M

1996 ACTIVITY PLANS

COPY

H IIDA

B COBB

H SUGIMURA

G BAINES

L BLAKE

B FLEMING

G GRAHAM

A GRAY

T HATA

K HENDERSON

K KIMURA

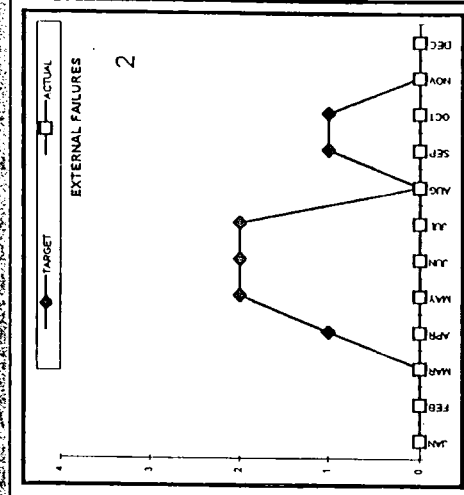
C MACKAY

S MORI

TARGET	ITEM	M. FISKE	M. HENSON	J. JOLLIE	P. MOSS	T. UNDERWOOD	S. WYLLIE	ACTIVITIES	WHEN
EQ Stabilisation (Cont'd)	Training of Maint. Department	<input type="radio"/>		<input checked="" type="radio"/>				Ensure all Maint. Techs. have had training on EQ - new equipment - Make matrix of Maint Techs/ training items and maintain	May-96 Nov-95
	Spares/Documentation	<input type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>			- Ensure adequate spares are available & stored prior to SOP - Ensure software package is available for reference/maint. of all EQ drawings	Apr-96 Feb-96
	Handover of Cells to Production	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	- Ensure relevant paperwork & snagging items are complete to allow handover to Prod. Dept. - Make schedule	Jun-96 Nov-95
Post SOP Activities	Robot Speed Ups	<input checked="" type="radio"/> (new EQ Robots)		<input type="radio"/>	<input checked="" type="radio"/> (Cover EC Robots)		<input type="radio"/>	- Improve efficiency by speed up of EQ Robots - Make schedule	Aug - Dec-96 Nov-95
	Automation		<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	- Make Schedule - Allocate Budget - Implement Schedule	Nov-95 Nov-95 Aug-Dec 96
	Downtime Reporting System	<input checked="" type="radio"/>					<input type="radio"/>	- Set Targets (breakdowns/time per shift) etc.	Jan-96
	Palletiser (Press Shop)	<input type="radio"/>			<input type="radio"/>		<input checked="" type="radio"/>	- Design & manuf. of automated systems in Press Shop (Palletising/P Shop Waffles)	Aug - Dec-96
	Spotweld at Press (Automated Cells @ 120 PRG)	<input type="radio"/>				<input type="radio"/>	<input checked="" type="radio"/>	- Feasibility Study - Prepare Costings - Make Plan - Implement Plan	Jan/Mar 96 Apr-96 Apr-96 Aug - Dec-96

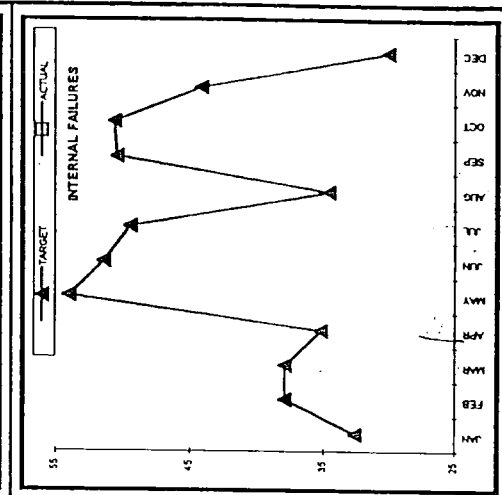
SUBJECT: CONTROL ITEM PERFORMANCE REMARKS WHEN ACTIVITY

EXTERNAL WELD FAILURE REDUCTION	1995		1996	
	ACT.	TGT	ACT.	TGT
TARGET SAME AS 1995 (DUE TO EQ S.O.P.)	1	0	0	0
1995 ACT=9	2	0	0	0
1996 TGT=9	3	0	0	0
1996 TARGET TO DATE = 0	0	1	0	0
1996 ACTUAL TO DATE = 0	0	2	0	0
JAN. RESULT	1	2	0	0
BUDGET Y.I.D.	1	2	0	0
BELOW BUDGET FOR 1996	0	0	0	0
	1	1	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0



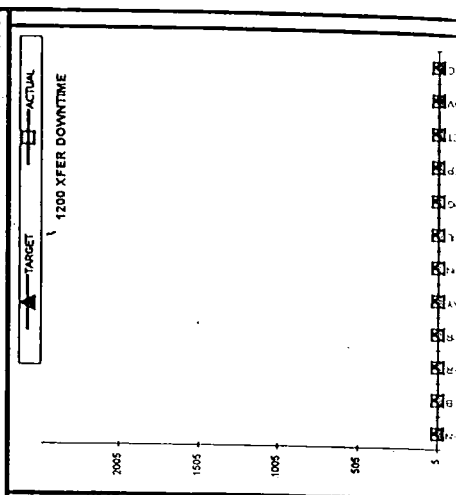
TARGET
ACTUAL

INTERNAL WELD FAILURE REDUCTION	1995		1996	
	ACT.	TGT	ACT.	TGT
TARGET IS HIGHER THAN 1995 DUE TO E.Q. DC TARGET IS 5% REDUCTION	51	33	0	0
1995 ACT=401	57	38	0	0
1996 TGT=508	41	38	0	0
1996 TARGET TO DATE = 0	45	35	0	0
1996 ACTUAL TO DATE = 0	20	54	0	0
BUDGET Y.I.D.	42	51	0	0
BELOW BUDGET FOR 1996	28	49	0	0
	8	35	0	0
	30	50	0	0
	38	51	0	0
	18	44	0	0
	30	30	0	0



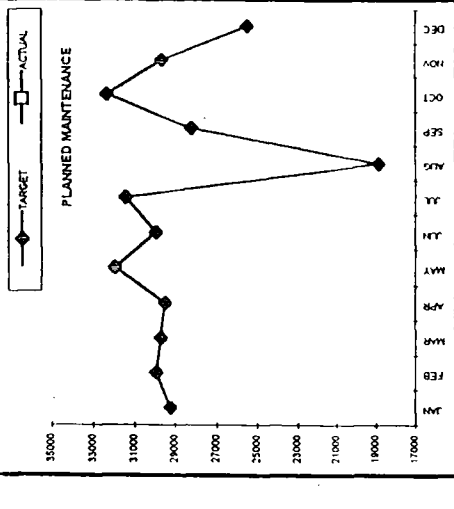
TARGET
ACTUAL
BALANCE

1200 XFER MACHINE DOWNTIME	1995		1996	
	ACT.	TGT	ACT.	TGT
TARGET IS REDUCTOIN OF 0% OF 1995 FIGURE				
1995 ACT=				
1996 TGT=				
1996 TARGET TO DATE = 0				
1996 ACTUAL TO DATE = 0				
JAN. RESULT				
BUDGET Y.I.D.				
BELOW BUDGET FOR 1996				



TARGET
ACTUAL
BALANCE

TARGET
ACTUAL
BALANCE



Nov-95

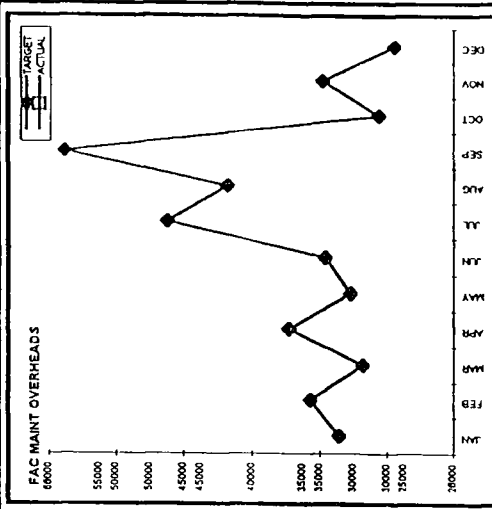
JAN RESULT ABOVE
BUDGET - CURRENTLY
£0
BELOW BUDGET FOR 1996

	1995		1996	
	ACT.	TGT	ACT.	TGT
Jan	32911	29232		
Feb	33169	29921		
Mar	33359	29692		
Apr	26966	29479		
May	30920	31952		
Jun	31441	29929		
Jul	29345	31415		
Aug	19453	18837		
Sep	28160	28235		
Oct	30571	32324		
Nov	30133	29646		
Dec		25500		

REDUCTION OF 2%
FROM 1995 TOTAL
SAVING = £5501
EXTRA DEMAND REQD
FROM EQ S.O.P.
1995 ACT=£351713
1996 TGT=£346212
1996 TARGET TO DATE =
£0
1996 ACTUAL TO DATE =
£0

ELECTRICITY

TARGET
ACTUAL
BALANCE



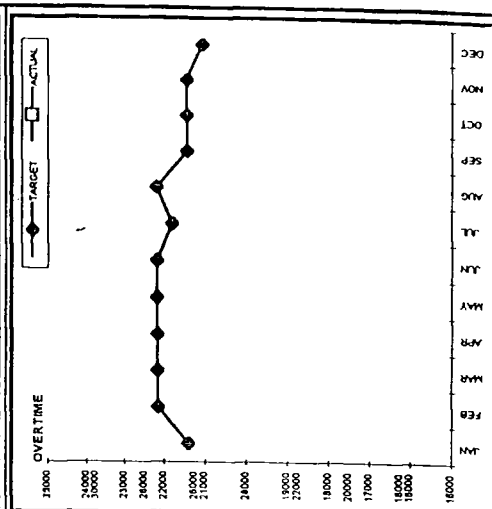
JAN RESULT ABOVE
BUDGET - CURRENTLY
£0
BELOW BUDGET FOR 1996

	1995		1996	
	ACT.	TGT	ACT.	TGT
Jan	36464	33600		
Feb	39281	35735		
Mar	31191	31835		
Apr	21455	37335		
May	35919	32735		
Jun	57606	34635		
Jul	36156	46185		
Aug	52118	41800		
Sep	37725	53835		
Oct	38413	30635		
Nov	35671	34835		
Dec		29500		

REDUCTION OF 3%
FROM 1995 TOTAL
SAVING = £15154
INCLUDES AN EXTRA
£20K ALLOCATED FOR
1 X ROBOT REFURB
1995 ACT=£453829
1996 TGT=£442665
1996 TARGET TO DATE =
£0
1996 ACTUAL TO DATE =
£0

FACILITY
MAINT.
O/HEADS

TARGET
ACTUAL
BALANCE



JAN RESULT ABOVE
BUDGET - CURRENTLY
£0
BELOW BUDGET FOR 1996

	1995		1996	
	ACT.	TGT	ACT.	TGT
Jan	16825	21411	0	0
Feb	20958	22168	0	0
Mar	19425	22174	0	0
Apr	19336	22180	0	0
May	16598	22186	0	0
Jun	19100	22192	0	0
Jul	21110	21818	0	0
Aug	22804	22204	0	0
Sep	25311	21448	0	0
Oct	28896	21452	0	0
Nov	27124	21457	0	0
Dec		21078	0	0

ACHIEVEMENT OF
BUDGET
1995 ACT=£250755
1996 TGT=£261768
1996 TARGET TO DATE =
£0
1996 ACTUAL TO DATE =
£0

OVERTIME

GRAPH SHOWS TOTALS FOR
ENG. + FAC. MAINT. + EQ ENG

NOVEMBER REULTSCOPY

H IIDA

B COBB

H SUGIMURA

G BAINES

L BLAKE

B FLEMING

G GRAHAM

A GRAY

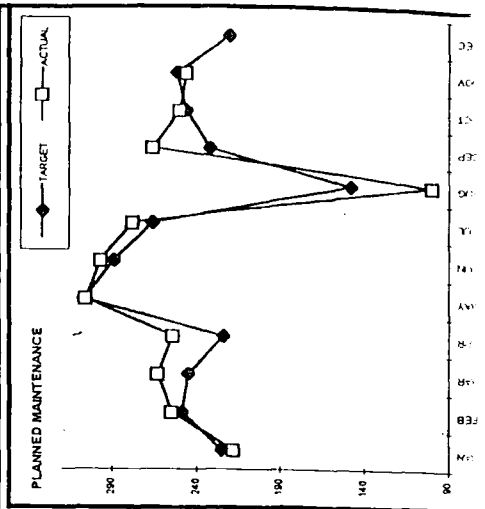
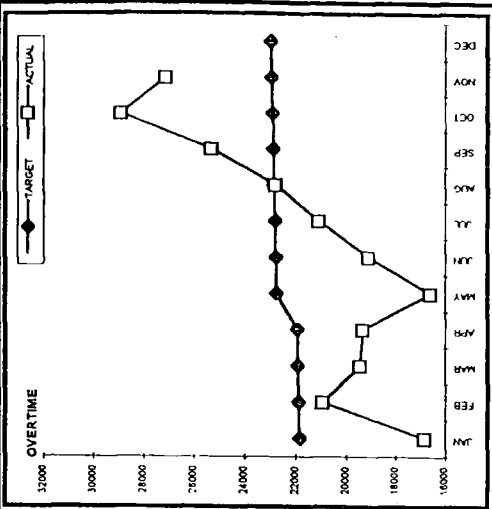
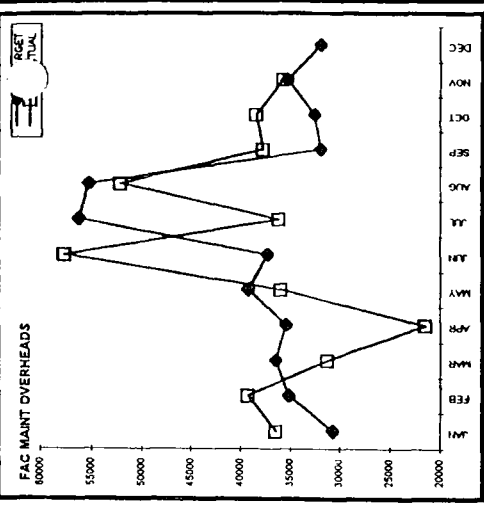
T HATA

K HENDERSON

K KIMURA

C MACKAY

S MORI



NOVEMBER
 £400 OVERSPEND ON FAC MAINT O/HEADS
 5K UNDERSPEND ON PRESS SPARES
 6K OVERSPEND ON ASSY SPARES

OVERTIME INCREASED SUBSTANTIALLY DUE TO E.O.S COVER ON 2XSHIFT

EQ WORKLOAD DUE TO OFF SITE WORK AND IN HOUSE TRIALS

SINCE SHIFT CHANGE THERE IS AN IMBALANCE IN PLANNED & ACTUAL TIMES.
 i.e JIG PMS ORIGINALLY FOR SUNDAY MAY NOW BE NEXT FRIDAY

CRANE ACCESS IS VERY LIMITED BUT THESE PMS ARE ADDITIONAL TO TARGET 95

NOV RESULT ABOVE BUDGET - CURRENTLY £3,381
 BELOW BUDGET FOR 1995

GRAPH SHOWS TOTALS FOR ENG. + FAC. MAINT + EQ. ENG

FAC MAINT ABOVE BUDGET

EQ ENG ABOVE BUDGET

ENG DEPT ABOVE BUDGET

NOV RESULT ABOVE BUDGET - CURRENTLY £10,140
 BELOW BUDGET FOR 1995

NOV RESULT BELOW TARGET - CURRENTLY 50

	1994		1995	
	ACT.	TGT	ACT.	TGT
Jan	16300	30705	36464	
Feb	36200	35180	39281	
Mar	35261	36455	31191	
Apr	25739	35430	21455	
May	16506	39255	35919	
Jun	48017	37280	57606	
Jul	30739	56205	36156	
Aug	30071	55230	52118	
Sep	53656	31905	37725	
Oct	49360	32480	38413	
Nov	58049	35255	35671	
Dec	79065	31830		

	1994		1995	
	ACT.	TGT	ACT.	TGT
Jan		21851	16825	
Feb		21885	20958	
Mar		21917	19425	
Apr		21951	19336	
May		22757	16598	
Jun		22790	19100	
Jul		22826	21110	
Aug		22861	22804	
Sep		22896	25311	
Oct		22930	28896	
Nov		22963	27124	
Dec		22998		

	1994		1995	
	ACT.	TGT	ACT.	TGT
Jan		225	218	
Feb		249	255	
Mar		245	263	
Apr		224	254	
May		307	306	
Jun		289	297	
Jul		266	278	
Aug		148	100	
Sep		232	266	
Oct		246	250	
Nov		252	246	

REDUCTION OF 10% FROM 1994 TOTAL

NOTE
 1994 BUDGET DID NOT INCLUDE JIG MAINT(32K) /SUMMER S/DOWN WORK ALSO JAN / MAR WAS WORKED ON SINGLE SHIFT ONLY

1995 TARGET TO DATE = £425,380
 1995 ACTUAL TO DATE = £421,999

REDUCTION OF 10% FROM 1994 TOTAL

1995 TARGET TO DATE = £247,627
 1995 ACTUAL TO DATE = £237,487

ACHIEVEMENT OF MONTHLY TARGETS

1995 TARGET TO DATE = 2683
 1995 ACTUAL TO DATE =

PLANNED MAINT. ACTIVITIES

OVERTIME

PLANNED MAINT. ACTIVITIES

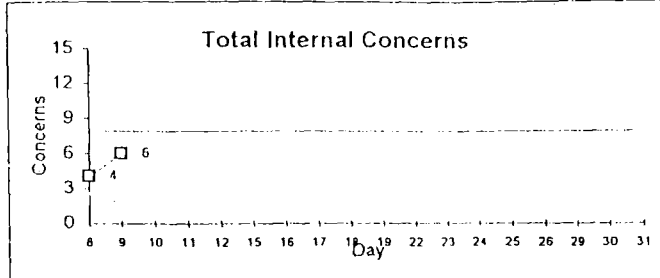
APPENDIX SIX

DAILY MANAGEMENT RAPID RESPONSE SHEET

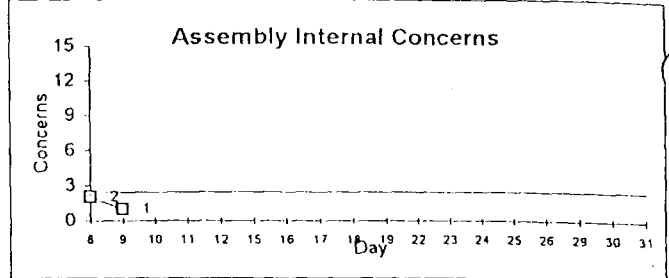
BG 96 REVIEW

NYEL DAILY QUICK RESPONSE MONITOR

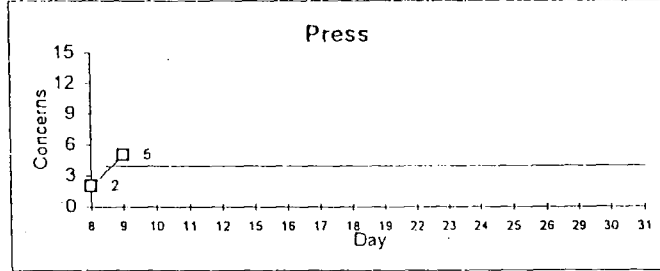
1995 Avg = 8.14 Target = 8.3 Running Avg 5.00



1995 Avg = 2.29 Target = 2.2 Running Avg 1.50



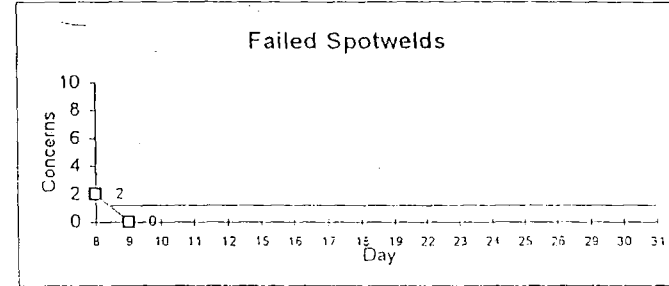
1995 Avg = 3.76 Target = 3.62 Running Avg 3.50



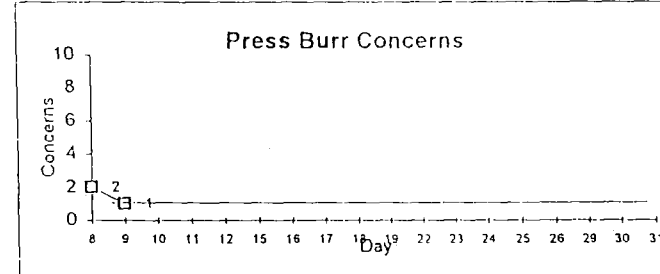
Part No	Wctre	F.Code	Grade	QTY	NCR No	RESP
75171 90J00	331	FS	B	40	A9771	BF

Part No	Wctre	F.Code	Grade	QTY	NCR No	RESP
80991 90J00	200	IF	B	1	P9772	CMc
09117 3451 87	212	ET	B	232	P9773	CMc
76272/3 41B00	206	B	C	4460	DP9774	CMc
73131 50B10	207	PB	B	1528	DP9775	CMc
73142 50B19	207	SD	B	300	DP9776	CMc

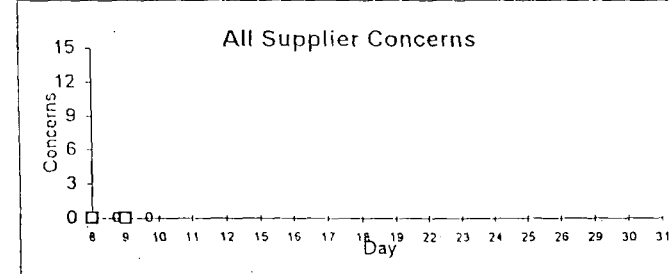
1995 Avg = 1.51 Target = 1.44 Running Avg 1.00



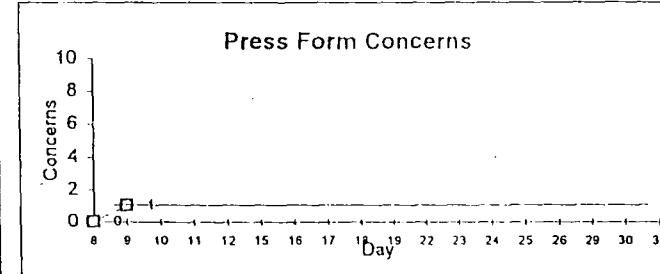
1995 Avg = 1.02 Target = 0.98 Running Avg 1.50



1995 Avg = 2.15 Target = TBA Running Avg 0.00

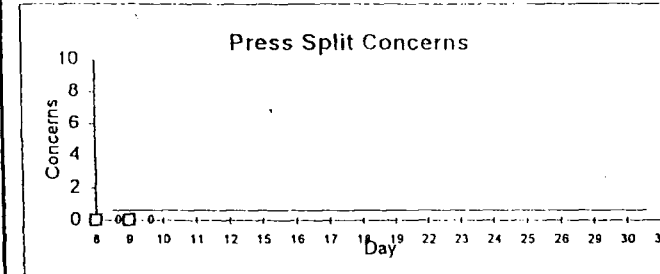


1995 Avg = 0.94 Target = 0.91 Running Avg 1.50



Part No	Supp.	F.Code	Grade	QTY	NCR No	RESP

1995 Avg = 0.56 Target = 0.54 Running Avg 1.50



APPENDIX SEVEN

NYEL'S TEN STEP TQC STORY

TQC STEPS

STEP 1	THEME (SUB THEME)	MACRO LEVEL (SPECIFIC)	TOOLS
STEP 2	REASON TO CHOOSE	BACKGROUND OF PROBLEM	GRAPHS PARETO HISTOGRAM MATRIX DIAGRAM
STEP 3	GRASP CURRENT SITUATION	USING DATA TO EXPRESS GOOD/BAD	PARETO HISTOGRAM CAUSE & EFFECT CHECK SHEETS RELATIONS DIAGRAM AFFINITY DIAGRAM MATRIX DIAGRAM
STEP 4	TARGET	WHAT, WHEN, HOW MUCH	MATRIX DIAGRAM
STEP 5	ACTIVITY SCHEDULE	WHAT, WHO, BY WHEN	MATRIX DIAGRAM
STEP 6	ANALYSIS & VERIFICATION	IDENTIFY ALL POSSIBLE CAUSES VERIFY REAL CAUSES	CAUSE & EFFECT SCATTER DIAGRAM RELATIONS DIAGRAM HISTOGRAM AFFINITY DIAGRAM SYSTEMATIC DIAGRAM MATRIX DATA ANALYSIS
STEP 7	COUNTERMEASURE	WHAT CORRECTIVE ACTION TO TAKE	SYSTEMATIC DIAGRAM P.D.P.C. ARROW DIAGRAM MATRIX DIAGRAM
STEP 8	CONFIRM EFFECT	BEFORE/AFTER RESULTS	PARETO HISTOGRAM CONTROL CHART
STEP 9	HADOME (PREVENTION)	PREVENTION FOR FUTURE	CHECK SHEET CONTROL CHART MATRIX DIAGRAM
STEP 10	REVIEW/FUTURE SUBJECT	GOOD POINTS/BAD POINTS NEXT ACTIVITY	GRAPHS MATRIX DIAGRAM

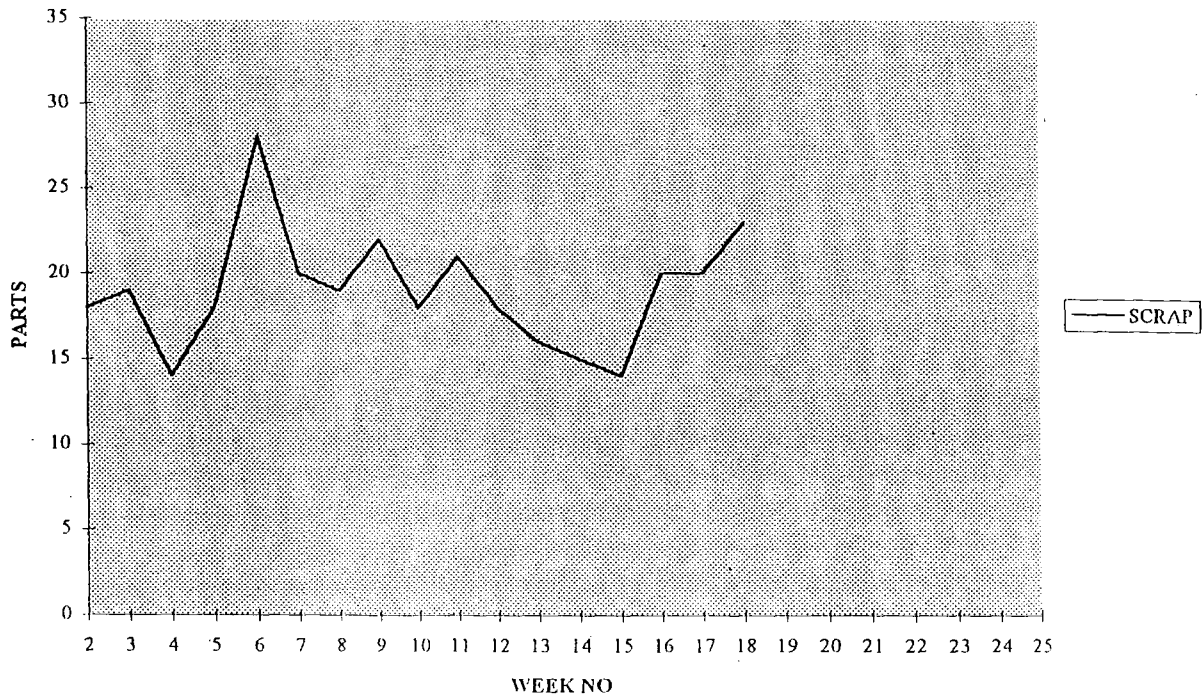
APPENDIX EIGHT

**CROSS FUNCTIONAL TEAM TARGET:
DOCUMENTATION**

ASSEMBLY SCRAP REDUCTION

APRIL 1996

CELL 442
SCRAP



SALES PRICE £11.28

CURRENT QUALITY CHECKS

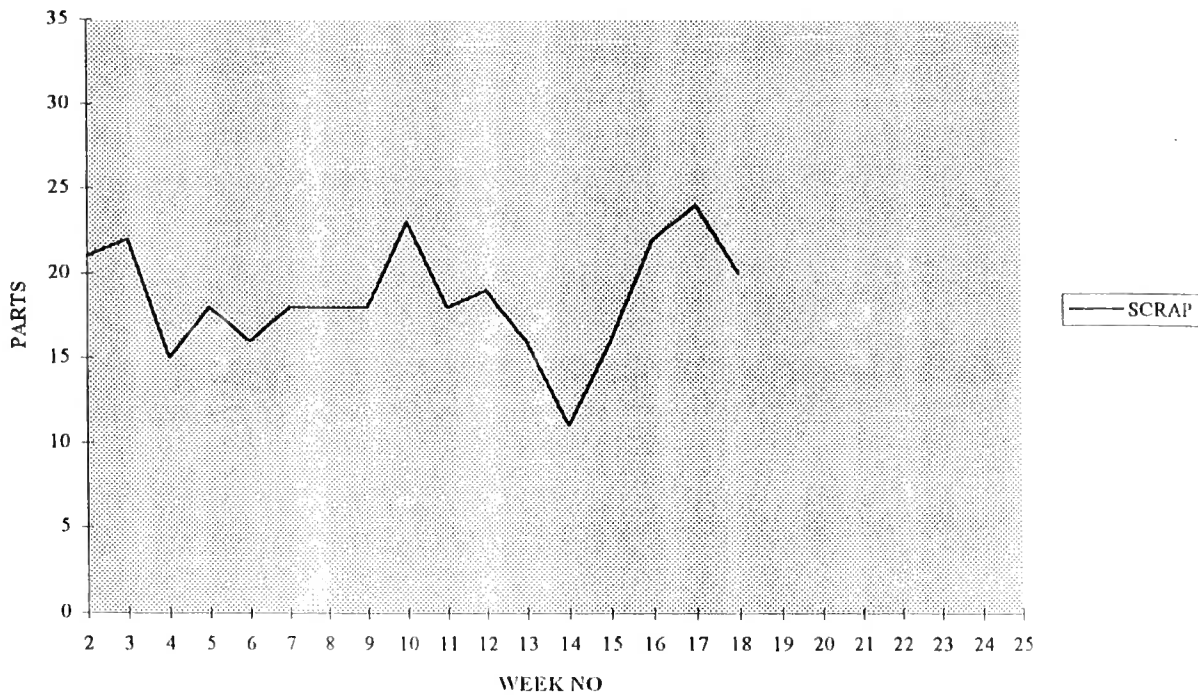
75510 50B00 F/70/L & 1 TEARDOWN PER JIG PER SHIFT

PROPOSED ACTION

PLAN NOW IN ENGINEERING HANDS REGARDING CHANGE IN PRODUCTION SEQUENCE TO ELIMINATE ONE OF THE TWO IMPORTANT "A" STAGES. THERE IS ALSO A KAIZEN IDEA IN PLACE TO ELIMINATE STAGE 5 ROBOT & SHARE ITS SPOT WELDS ON OTHER STAGES. ELIMINATING ONE OF THE IMP "A" STAGES WOULD RESULT IN AN IMMEDIATE SAVING OF APPROX £4700 A YEAR WITH THE REDUCTION OF TEARDOWNS BY 50%.

THIS EXERCISE SHOULD BE COMPLETE BY END OF MAY.

CELL 432 SCRAP



SALES PRICE = £11.14

CURRENT QUALITY CHECKS

75511 50B00 F/70/L & 1 TEARDOWN PER JIG PER SHIFT

PROPOSED ACTION

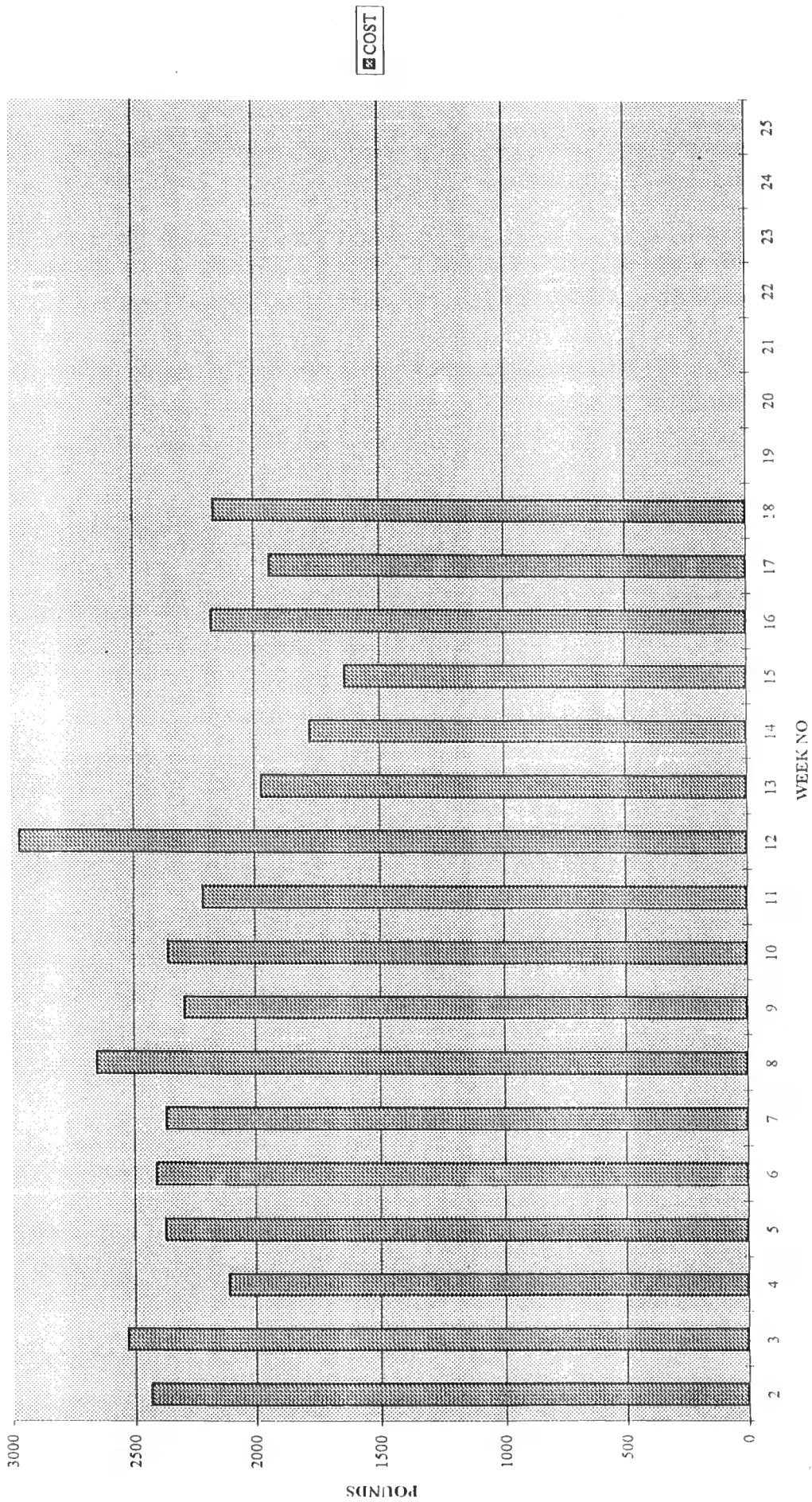
PLAN NOW IN ENGINEERING HANDS REGARDING CHANGE IN PRODUCTION SEQUENCE TO ELIMINATE ONE OF THE TWO IMPORTANT "A" STAGES. THERE IS ALSO A KAIZEN IDEA IN PLACE ON CELL 442 (OPPOSITE HAND) TO ELIMINATE STAGE 5 ROBOT & SHARE ITS SPOTWELDS ON OTHER STAGES. ELIMINATING ONE OF THE IMPORTANT "A" STAGES WOULD RESULT IN AN IMMEDIATE SAVING OF APPROX £5100 WITH THE REDUCTION OF TEARDOWNS BY 50% .

THIS EXERCISE SHOULD BE COMPLETE BY EARLY JUNE.

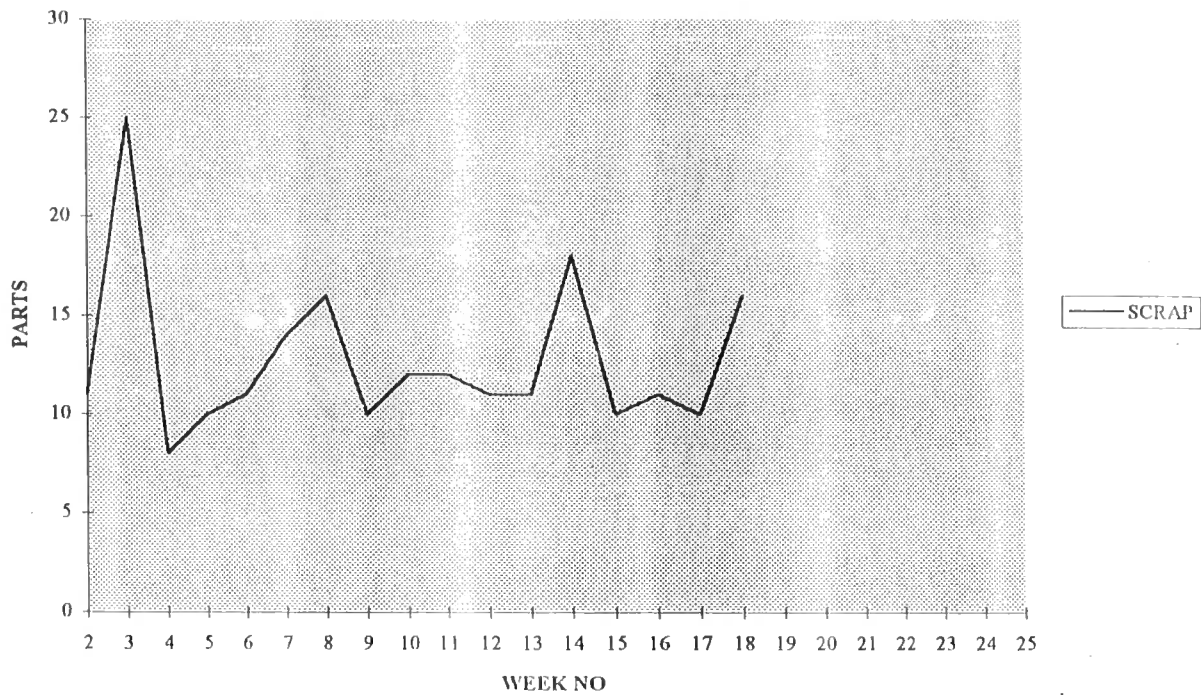
TOP 20 SPOTWELD ASSYS

CELL	PART NO	SALES COST	AVE WEEKLY SCRAP	EST 1996 COST	NCR s							TOT ACTION
					92	93	94	95	96			
401	62500 71B00	18.15	9.07	435.36	1	1	5	1	0	8		
474	67400 52B00	19.45	350.1	16,804.80	0	6	26	20	0	52		
430	67330 ALL VAR	3.09	53.3	2,558.40	0	1	0	0	0	1 YES		
451	73140 50B10	3.54	41.59	1,996.32	0	1	2	2	0	5		
450	74370 52B00	3.53	92.66	4,447.68	0	4	1	3	0	8		
427A	75630 51B00	4.77	62.01	2,976.48	0	0	8	17	0	25		
427B	75650 50B00	4.82	12.05	578.4	0	1	5	1	0	7		
421	76452/3 VAR	2.1	3.15	151.2	0	0	7	2	0	9		
424	76530/1 53B00	2.21	3.31	158.88	0	0	0	0	0	0		
446A	76630 53B00	3.71	28.75	1,380	0	0	0	2	0	2 YES		
	76631 53B00	3.3	23.49	1,127.52	0	0	0	1	0	1 YES		
408	78116 50B00	3.24	100.44	4,821.12	2	0	1	12	1	16		
	78117 50B00	3.23	90.44	4,341.12	1	0	2	2	0	5		
429	74354 50B00	2.48	33.48	1,607.04	0	0	2	0	0	2 YES		
462	65610 50B00	2.24	36.4	1,747.20	0	0	3	3	0	6		
432	75511 50B00	11.14	211.66	10,159.68	23	30	42	47	6	148 YES		
442	75510 50B00	11.28	194.58	9,339.84	52	37	38	46	3	176 YES		
404	75640 50B00	3.26	15.48	743.04	0	0	1	0	0	1		
470A	67440/1 41B00	1.4	65.27	3,133.00	0	1	0	0	0	1 YES		
470B	67420 50/52B00	1.46	36.51	1752.48	0	0	0	1	0	1 YES		
	67432 41B00	1.47	37.47	1798.56	0	0	0	0	0	0 YES		
406	67874/6 X4 SUB	AVE=1.38	138	6624	0	0	10	15	2	27 YES		
446B	76684/5 50B00	0.56	43.5	2008	0	0	0	1	0	1 YES		
			TOTAL EST COST	79083.08								

DC ASSY SCRAP



CELL 429 SCRAP



SALES PRICE = £2.47

CURRENT QUALITY CHECKS HISTORIC CONCERNS

74354 50B00 F/100/L

2 FAILURES IN 1995

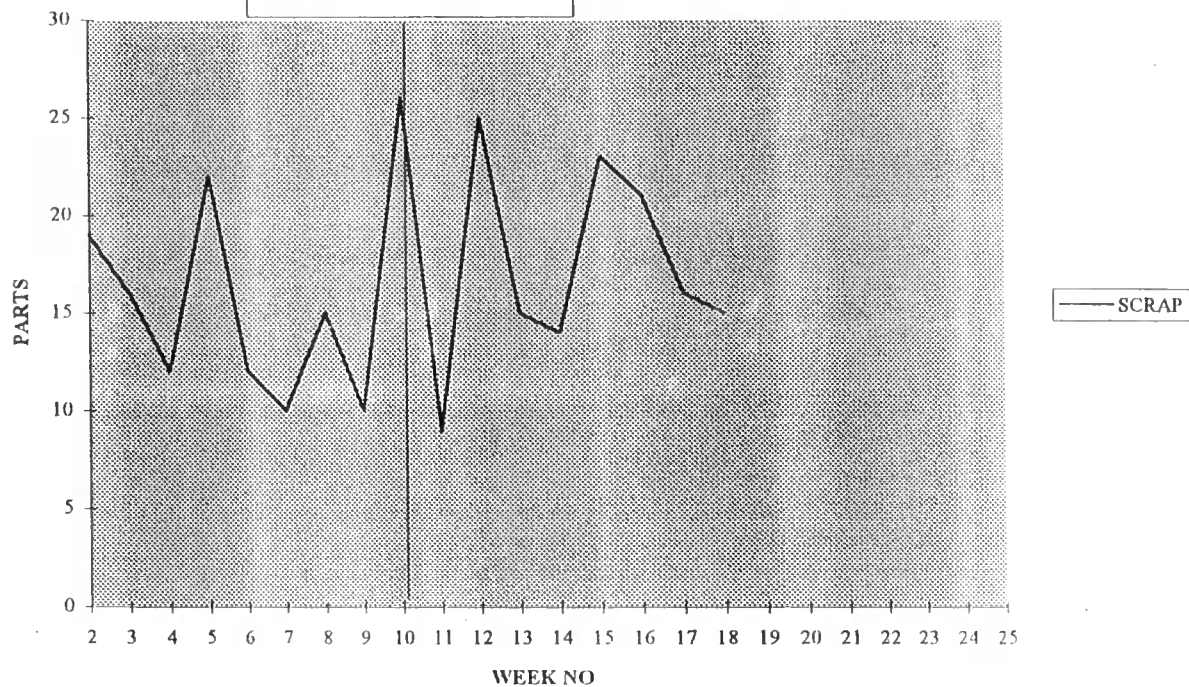
1 PER SHIFT TEARDOWN CURRENTLY BEING INVESTIGATED WITH A GREY.

PROPOSED ACTION

ONCE NEW OPERATORS SETTLED IN ON E LINE A TEARDOWN PER SHIFT WILL TAKE PLACE WITH OTHER CHECKS BEING CHISEL CHECK & REPAIR. WITH CURRENT FREQUENCY OF F/100/L THE SCRAP LEVEL SHOULD REDUCE TO 9 PER WEEK.

CELL 430 SCRAP

WORK INSTRUCTION 0042
IMPLEMENTED WEEK 11



AVERAGE SALES PRICE = £3.09

CURRENT QUALITY CHECKS

HISTORIC CONCERNS

67330 50B00 F/120/L

1 FAILURE IN 1993

67330 51B00 F/120/L

67330 52B00 F/120/L

67330 52B10 F/120/L

PROPOSED ACTION

NON DESTRUCT CHISEL CHECK ON 67330 50B00

NON DESTRUCT CHISEL CHECK ON 67330 51B00

NON DESTRUCT CHISEL CHECK ON 67330 52B00

DESTRUCTION ON 67330 52B10

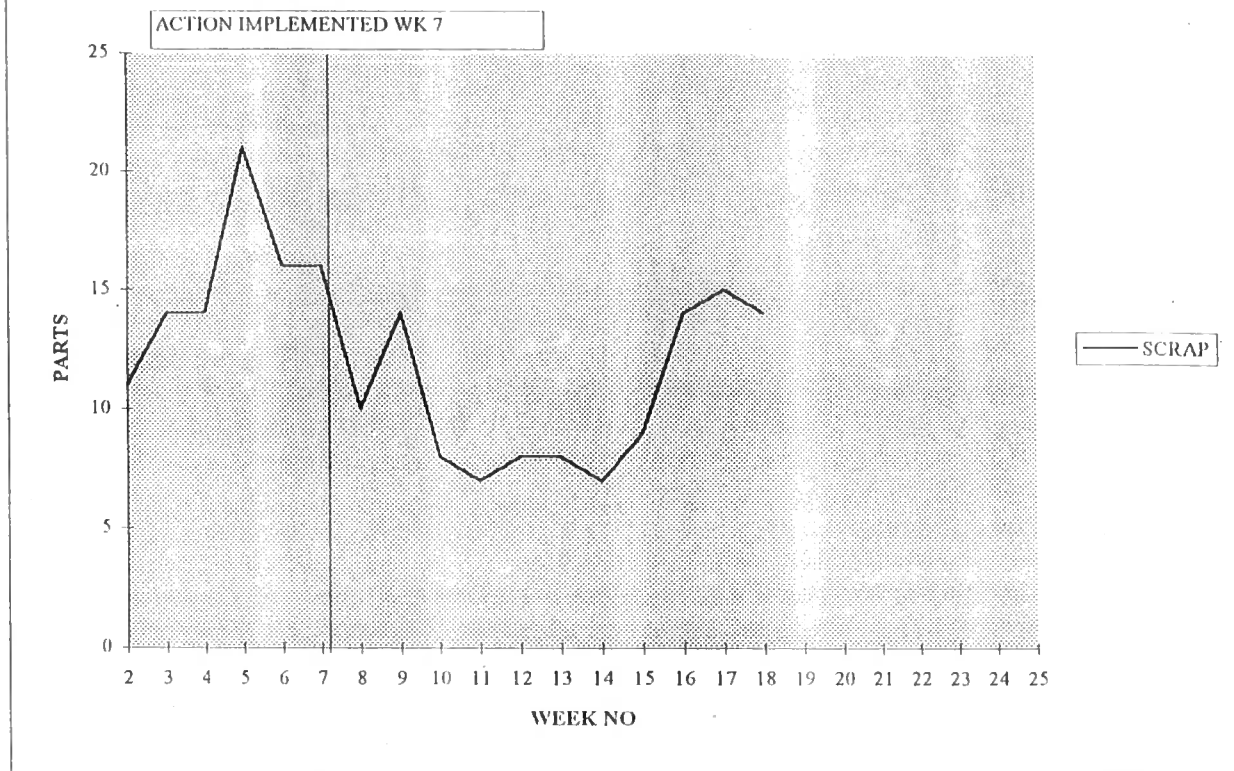
INSTRUCTIONS ON ABOVE CHECKS ON A-WI-0042

RECENT RISE IN SCRAP QTYS DUE TO MISS-FEEDS

FROM BOLT FEEDERS INCREASING. TO BE INVESTIGATED

WHEN MAINTENANCE ZONING COMMENCES.

CELL 446A SCRAP



AVERAGE SALES PRICE = £3.50

CURRENT QUALITY CHECKS

76630 53B00 F/90/L

76631 53B00 F/150/L

HISTORIC CONCERNS

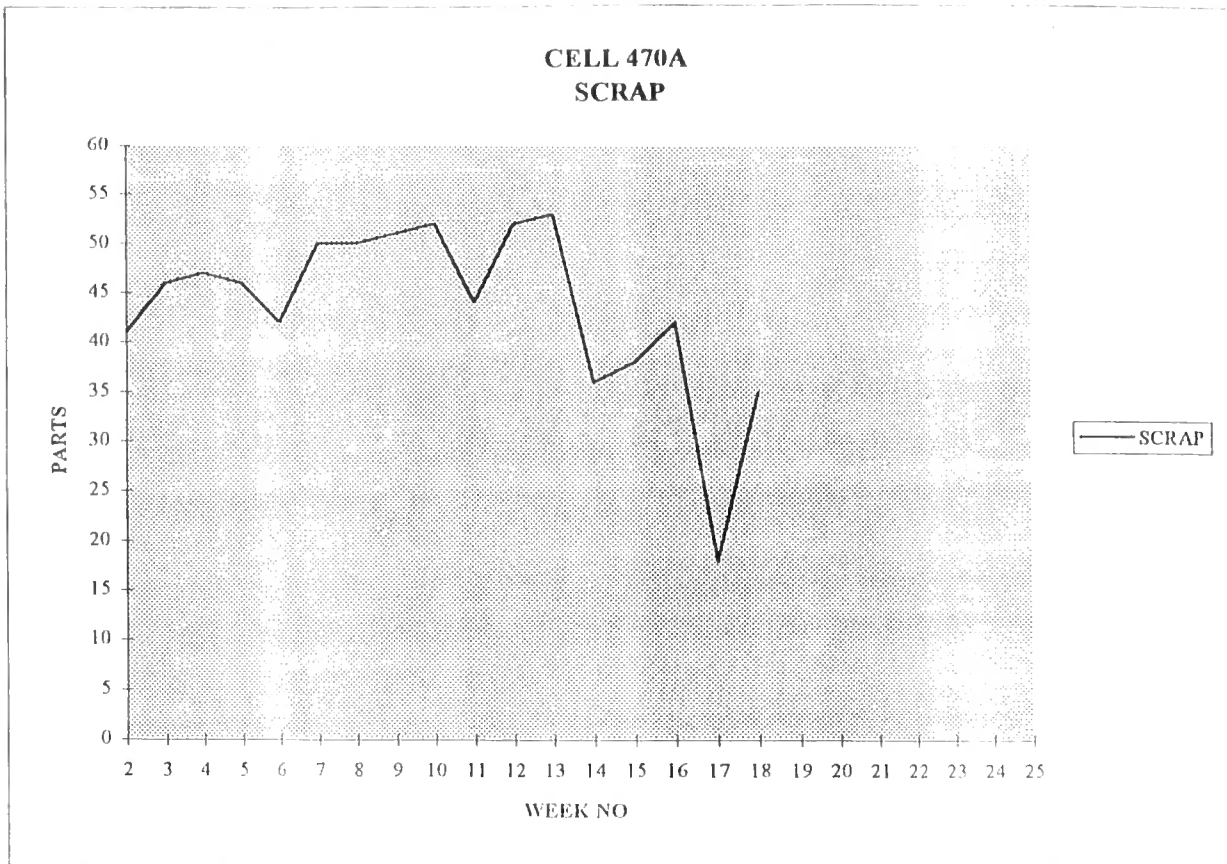
2 FAILURES IN 1995

1 FAILURE IN 1995

GOOD RESULTS UNTIL WEEK 15 .THIS IS DUE TO NEW LINE RESPONSIBILITY'S ON DC AND SHOULD GRADUALLY REDUCE TO PREVIOUS LOW LEVELS.

PROPOSED ACTION

LONGER RUNS FOR PRODUCTION (2RUNS NOT THREE PER WEEK) HAVE MADE AN IMPROVEMENT .CHECKS MADE ON PART ASSYS WHICH CAN BE REPAIRED AND NOT ON FULL ASSYS WHICH WOULD HAVE TO BE SCRAPPED.



CURRENT QUALITY CHECKS

67440/1 41B00 F/200/L

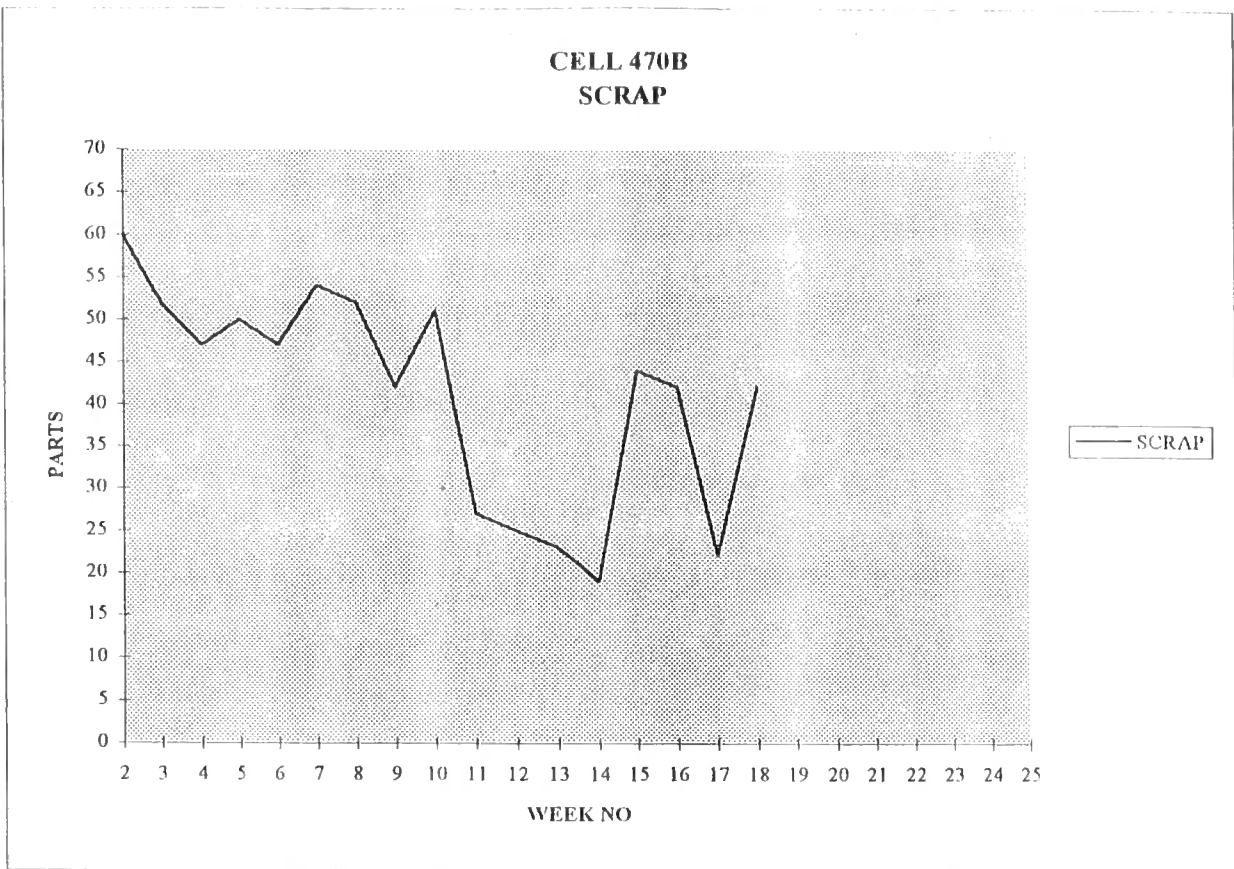
HISTORIC CONCERNS

1 FAILURE ON 67441 IN 1993

PROPOSED ACTION

SCRAP FIGURES AT PRESENT HIGHER THAN NORMAL AS TEMP LABOUR IN PROCESS OF TRAINING ON THIS CELL & ON CELL 470B. TQC EXERCISE CURRENTLY BEING HELD BY P DODDS, W BUTLER & G ADAMSON ON SCRAP REDUCTION ON BOTH 470 CELLS AND ON CELL 474.

TEMP LABOUR SKILL LEVELS IMPROVING WITH IMPROVEMENTS NOW APPARENT.



CURRENT QUALITY CHECKS

67420 50/52B00 F/M/L

67432 41B00 F/200/L

HISTORIC CONCERNS

I FAILURE IN 1995

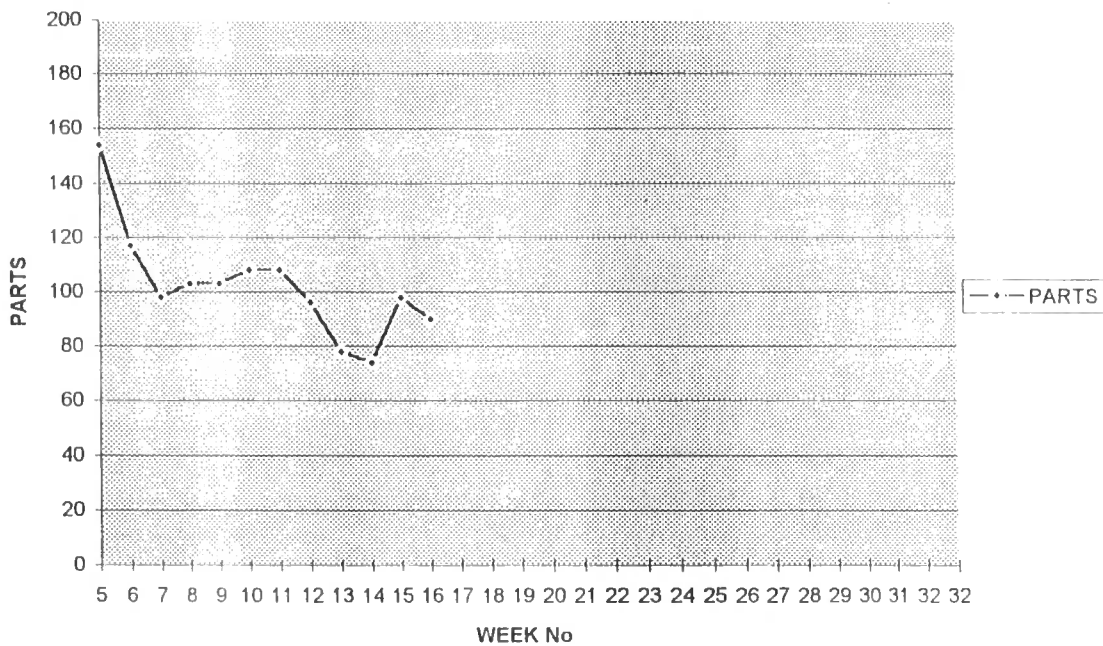
NO FAILURES

PROPOSED ACTION

SCRAP FIGURES AT PRESENT HIGHER THAN NORMAL AS TEMP LABOUR IN PROCESS OF TRAINING ON THIS CELL ON CELL 470B. TQC EXERCISE CURRENTLY BEING HELD BY P DODDS, W BUTLER & G ADAMSON ON SCRAP REDUCTION ON BOTH 470 CELLS AND ON CELL 474.

AS IN CASE OF 470A TEMP SKILL LEVELS RISING GIVING GRADUAL IMPROVEMENTS.

CELL 406 SCRAP



CURRENT QUALITY CHECKS

1ST/125/LAST SNP 125

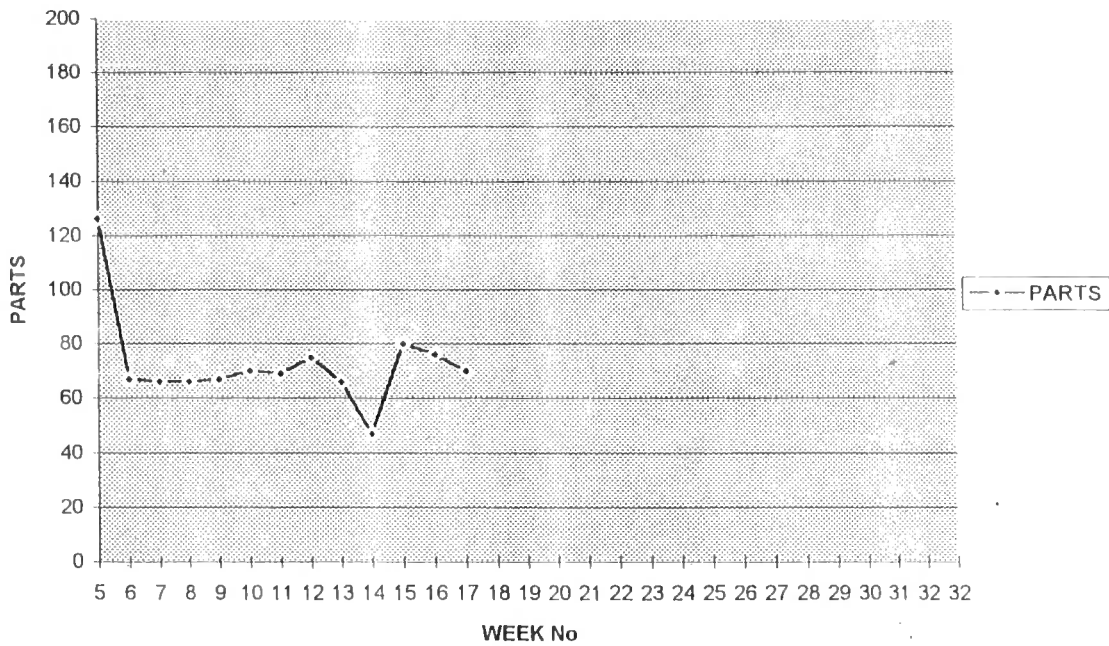
PROPOSED ACTION

COMBINE CHECK SHEETS OF RHD & LHD ,AS SUB ASSYS ARE USING SAME PROCESS AND SAME MATERIAL.
(DIFFERENT JIGS BUT NO AFFECT HISTORICALLY)
CELL CAN ALSO HOLD 375 OF EACH PART AT THE CELL SO FREQUENCY CAN BE SET AT F/200/L THIS WOULD COVER SHIFT BUILD OF COMBINED RHD & LHD PARTS AND WOULD BE RETAINED AT THE CELL.

ASSEMBLY CHECK SHEETS TO BE MODIFIED AND WORK INSTRUCTIONS TO BE PRODUCED.

AN ASSEMBLY STOCK BUILD WOULD BE REQUIRED BEFORE ACTION COMMENCED AS CURRENTLY LOW STOCK OF SUBS ON CELL 465.

CELL 446B SCRAP



CURRENT QUALITY CHECKS

- 76684 50B00 SEPERATE CHECK SHEETS WITH FREQUENCY OF F/150/L WITH SNP OF 10
- 76684 50B10 SEPERATE CHECK SHEETS WITH FREQUENCY OF F/150/L WITH SNP OF 10
- 76685 50B00 SEPERATE CHECK SHEETS WITH FREQUENCY OF F/150/L WITH SNP OF 10
- 76685 50B10 SEPERATE CHECK SHEETS WITH FREQUENCY OF F/150/L WITH SNP OF 10

PROPOSED ACTION

1 TEARDOWN PER SHIFT USING THE 50B10 DERIVATIVE TO COVER ALL SPOT WELDS. CHISEL CHECKS TO BE USED ON OTHER CHECKS (REDUCE SEVERITY OF CHECKS)

ASSEMBLY WORK INSTRUCTION TO BE PRODUCED

APPENDIX NINE

SPOT WELD IMPROVEMENT: SAMPLE MINUTES & SUPPORTING DOCUMENTATION



MINUTES OF MEETING

PAGE 1 OF 2

LOCATION OF MEETING

NYEL

SUBJECT 1995 ACTIVITIES - WELD FAILURES

MEETING NUMBER

1


DATE/TIME

1/12/94 @ 1pm

PRESENT AT MEETING

NAME	COMPANY	COPIES
CAMBROOK FISKE FLEMMING MILLER MITSUHASHI POTTS UNDERWOOD WYLLIE		

ADDITIONAL COPIES

BAINES COBB GRAY MORI Moss 		
--	--	--

SIGNED

EC

E. Cambrook

DATE

1-12-94

ITEM		ACTION
1	<p>REV 2 OF 1995 ACTIVITY PLAN WAS REVIEWED WITH THE FOLLOWING OUTCOME:</p> <p>INTERNAL TARGET FOR ASSEMBLY NCR DUE TO S. WELD FAILURE WAS SEEN TO BE HIGHER THAN THAT OF THE TOTAL ALLOCATION - DISCUSSIONS WITH A. GRAY REQUIRED TO REVISE MASTER SCHEDULE</p> <p>- S. WYLLIE HAS TARGET Nos/MONTH S. WYLLIE EXPLAINED HOW TARGETS WERE ACHIEVED: BASICALLY No OF FAILURES AVERAGE/SHIFT FOR OCT 94 X No OF SHIFTS/MONTH - JAN/MAR - SAME TARGET - APR/DEC - REDUCTION OF 10%/MONTH</p>	<p>EC/GG</p> <p>INFO</p>
2	<p>SUB SCHEDULES ARE REQUIRED TO FEED INTO MASTER SCHEDULES - PROGRESS TO BE REVIEWED AT NEXT MEETING</p>	<p>ALL</p>
3	<p>MASTER PLAN WAS DISCUSSED AND UPDATED TO REV 4 (ATTACHED)</p>	
	<p><u>NEXT MEETING</u></p> <p>8/12/94 @ 1pm IN PROJECT ROOM</p>	

		1995															
		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
		*	*	*	*	*	*	*	*	*	*	*	*	*	*		
		P	A														
		A															
PROGRESS REVIEW	P															COMMENTS/RESPONSIBILITY	
MEETING	A																
MACHINE																	
STANDARD	P															B FLEMMING	
OPS	A																
WELD	P															B FLEMMING	
INTEGRITY	A																
OPERATOR	P															ASSY T/LEADERS/S.MANAGERS	
AWARENESS	A																
INACCESSIBLE	P															R.POTTS/B.FLEMMING	
WELDS	A																
CONSUMABLES	P															T UNDERWOOD/P MILLER	
RE-ORDERING REVIEW	A																
CONSUMABLES -COST	P				*							*				B FLEMMING	
MERITS (OLD TIPS)	A															M FISKE	
CONDITION REVIEW	P																
(SHUNTS)	A															S WYLLIE/P MILLER	
ISSUE OF NEW SHUNTS	P															P MOSS/S WYLLIE/J JOLLIE/M FISKE	
(STORES)	A																
FMEA	P															A BURNSIDE	
(SHUNTS)	A																
REFURBISHMENT	P															A BURNSIDE/T UNDERWOOD	
GUNS/CYLINDERS	A																
T/LEADER AWARENESS	P															M FISKE/S WYLLIE	
GUNS/CYLINDERS	A															B FLEMMING	
T/LEADER AWARENESS	P																
(SHUNTS) 13 Bars	A																
O/CHECK SYSTEM	P															R POTTS	
TIP/DRESS	A																
MATERIAL																	
WELD	P																
TESTER	A																
METHOD																	
WORK	P															B FLEMMING/S WYLLIE	
INSTRUCTION	A																
NCR	P															S WYLLIE/G TURNER	
DATA	A																
REPORT ON	P				*	*	*	*	*	*	*	*	*	*	*	S WYLLIE	
ANALYSIS	A															J JOLLIE	
W.CONDITION	P																
REVIEW PRESSURES	A															J JOLLIE/T UNDERWOOD	
MANUFACTURE	P																
ADAPTORS	A																
MAN																	
INTER-DEPT	P				*	*	*	*	*	*	*	*	*	*	*	ENGINEERING/ALL	
ACTIVITIES	A																



MINUTES OF MEETING

PAGE 1 OF 3

LOCATION OF MEETING

NYEL Project Room

SUBJECT REDUCTION OF WELD FAILURES

MEETING NUMBER 12

DATE/TIME 2/2/95

PRESENT AT MEETING 12/1/95 @ 1pm

NAME	COMPANY	COPIES
------	---------	--------

- CAMBROOK ✓
- FISKE ✓
- FLEMMING ✓
- HOLLIE ✓
- LOWES →
- MITCHELL →
- POTTS ✓
- WYLLIE ✓
- Luke
- Barnsley
- Underwood
- McKenna

ADDITIONAL COPIES

- AINES
- BOBB
- GRAHAM
- RAY
- MILLER
- MITSUHASHI
- RI
- ROSS
- Olsen
- Burnside
- Huntingdon
- Sanderson
- Others (names req'd)

PREPARED E. Cambrook

DATE 16.01.95

MINUTES OF MEETING
(CONTINUATION SHEET)

ITEM		ACTION
1	<p><u>MASTER SCHEDULE</u></p> <ul style="list-style-type: none"> - REV 1 MASTER SCHEDULE SUBMITTED TO REPLACE REV 4 OF ORIGINAL (OLD FORMAT) - REV 2 TO BE ISSUED TO REFLECT NEW INTERNAL TARGETS - NOTE NEW CHECKS WHICH MAY AFFECT TARGETS/RESULTS - CHECKS TO INACCESSIBLE WELDS (INCREASE OF 5% ON NORMAL CHECKS) - CHECKS TO NUGGET SIZES TO APPLY NES SPEC 	EC
2	<p><u>TIPDRESS FREQUENCY DISPLAY BOARDS</u></p> <ul style="list-style-type: none"> - EC - TRIAL BOARD FOR CELL 304 TO BE COMPLETED W/C 9/1/95 - DC - TRIAL BOARD FOR CELL 442 STAGE 6 TO BE COMPLETED W/C 9/1/95 - THE ABOVE ITEMS WERE DISCUSSED DURING THE MEETING AND FURTHER FEEDBACK TO CONTENTS OF BOARD TO BE DISCUSSED INTERNALLY WITH ASSEMBLY STAFF 	DM SL BF
3	<p><u>INTER-DEPARTMENTAL ACTIVITIES</u></p> <ul style="list-style-type: none"> - 432/442 - WELD CONFIRMATION TRIALS ONGOING - SEPARATE MEETING REQUIRED 13/1/95 TO DISCUSS NEXT STEP - 331 - PANEL MODIFICATIONS TO 75156/7 CURRENTLY ONGOING AT BARRETT'S BY NYEL DIE TECHS TO IMPROVE PANEL CONDITION (WELD 37 BEING PRIORITY) 	BF/SW/JJ/RP INFO
4	<p><u>INACCESSIBLE WELDS</u></p> <ul style="list-style-type: none"> - LIST GENERATED - SEE ATTACHED - ULTRA SONIC FLOW DETECTOR DUE ON SITE JAN 95 TO BEGIN CHECKS ON THESE WELDS - REVIEW AT NEXT MEETING 	INFO RP
5	<p><u>CONSUMABLES</u></p> <ul style="list-style-type: none"> - PRINT OUT OF STORES ITEMS NOW AVAILABLE - CROSS CHECK IN STORES REQUIRED TO RE-CONFIRM MAX/MIN RE-ORDER LEVELS - ACTIVITY DUE TO BE COMPLETE JAN 95 	INFO TU/PMILLER
6	<p><u>CONDITION REVIEW - SHUNTS</u></p> <ul style="list-style-type: none"> - OHMIC TESTER CURRENTLY ON TRIAL - REVIEW AT NEXT MEETING - UNIT TO ORDER W/C 16/1/95 - CHECKS TO SHUNTS TO BEGIN AFTER COMPLETION OF POKA YOKE PROJECT (JAN 95) - SCHEDULE REQUIRED 	MF/SW MF MF MF
7	<p><u>ISSUE OF SHUNTS</u></p> <ul style="list-style-type: none"> - LOGGING SYSTEM NOW SET UP IN STORES - LABELS NOW AVAILABLE - SHUNTS TO BE TAGGED ON REPLACEMENT (OLD FOR NEW) - SEPARATE MEETING REQUIRED TO REVIEW (PRODUCTION/MAINTENANCE/ENGINEERING) 	INFO INFO SW
8	<p><u>SHUNTS - FMEA</u></p> <ul style="list-style-type: none"> - NO PROGRESS - SEPARATE MEETING REQUIRED TO GENERATE SCHEDULE 	MF/JJ/SW/PM

	ACTION
<p><u>WASTE REMOVAL</u></p> <p>324 - NO SPARE - NEW CYLINDER TO ORDER PROPOSED REDUCTION OF PM'S ON IMPORTANT A CELLS TO GENERATE TIME FOR PM'S ON OTHER CELLS - SEPARATE MEETING REQUIRED</p>	<p>MF MF/AG</p>
<p><u>WELD TESTER</u></p> <p>TRIALS ON WELD TESTERS FOUND TO BE NOT SUITABLE FOR NYEL - ISSUE CLOSED</p>	<p>INFO</p>
<p><u>QUALITY DATA</u></p> <p>IT WAS AGREED THAT INFORMATION ON NCR'S HAS IMPROVED BUT THERE ARE CURRENTLY SOME VARIANCES BETWEEN INSPECTORS - STAMP TO BE GENERATED SO A STANDARD FORMAT CAN BE USED</p>	<p>SW/RP</p>
<p><u>REPORT ON ANALYSIS</u></p> <p>ALLOCATION OF CATEGORY (MAN/MACHINE/METHOD/MATERIAL) TO BE DECIDED AT MORNING QUALITY MEETING - INFO FEEDBACK ON A MONTHLY BASIS ANALYSIS OF WORST CELLS EC AND DC TO BE GENERATED ON A MONTHLY BASIS FEEDBACK FROM CONCERNS - INFO TO BE UPDATED ON A MONTHLY BASIS</p>	<p>SW SW EC/BF</p>
<p><u>WELD CONDITION - REVIEW OF PRESSURES</u></p> <p>CURRENTLY ON SCHEDULE - PRODUCTION TO ASSIST WHERE POSSIBLE</p>	<p>JJ/DM</p>
<p><u>TRAINING</u></p> <p>BACKBAR TRAINING PACKAGE COMPLETE - SCHEDULE REQUIRED FOR TRAINING COURSES SHUNTS - QUESTIONNAIRE TO BE GENERATED TO FIND CURRENT LEVEL OF KNOWLEDGE GUNS - NO PROGRESS - PACKAGE REQUIRED</p>	<p>TU/MF SW MF/SW MF</p>
<p><u>MEETING</u></p> <p>195 @ 1pm IN CANTEEN</p> <p>2/3/95.</p>	

SUBJECT REDUCTION OF WELD FAILURES

MEETING NUMBER 6

DATE/TIME 8/6/95 @1pm

PRESENT AT MEETING

NAME	COMPANY	COPIES
E CAMBROOK ✓ P WALL ✓ M FISKE ✓ B FLEMMING ✓ S LOWES ✓ A GRAY S SANDERSON ✓ TU CE SW		

ADDITIONAL COPIES

COBB GRAHAM MITCHELL MILLER MITSUHASHI MORI MOSS AC MAINT TEAM LEADERS WYLLIE McKENNA SCORER/M MADDISON BARNSLEY LUKE HENSON C ASSY TEAMLEADERS C ASSY TEAMLEADERS JOLLIE POTTS UNDERWOOD		
---	--	--

BY WELDERS

SIGNED

(EC)

E. Cambrook

DATE 8/6/95.

M	ACTION
<p><u>Master Schedule</u> Discussed & updated to Lvl. 7 (attached-1) May Activity Plan attached -2 <u>Tip Dress Frequency</u> Tip Dress Info for Cell 474 now passed on to Fac. Maint. Software to be installed and results monitored</p>	<p>Info. Info. SL/MF.</p>
<p><u>Inter-Departmental Activities</u> <u>May Feedback</u> <u>Cell 432</u> Tip Dress blades now fitted & OK. <u>Cell 442/432</u> Jig Adjusts complete & OK. <u>Cell 445</u> Not 100% but improvements have been noticeable during May.</p>	<p>Info. Info. Info.</p>
<p><u>Cell 427</u> Further investigations resulted in :- - Weld Conditions changed. - Back Bar replaced with proto-type which has proved successful - New Back-Bars to be manufactured & fitted. - <u>Result</u> - Pin Holes have reduced by over 80%. <u>note</u> potential concern with Press Part</p>	<p>Info. M.F.</p>

ITEM

ACTION

investigation reqd - (bowing)

R.P/B.F.

Cell 331

Mods for 75157 - not yet complete
(now outstanding for 2 months) revised
timing plan reqd.

R.P.

Cell 335

Trial complete. in Assy of parts with
projections deleted. Progress with NMUK/
status reqd.

B.F.

Activities for June

Pin holes causing problems on 432/442 ^{see attached}
Sequence of events to be:- (3 & 4)
(& 5)

i) Complete burn-off of K-D Parts

ii) Finalise approval of spot-weld positions
with NMUK.

R.P.

iii) Joint review of Weld Conditions.

B.F.

Cell 341

Internal Weld failures (3x off this week)

Investigation reqd on bad Panel fit.

R.P.

Cell 324

Ongoing problems with Auto Tio Dress -
Countermeasures reqd.

M.F.

Inaccessible Welds

K. Davis now allocated to progress Weld Tester - manufacturer to visit site for further technical advice.

A.G

Condition Review - Shunts

Ohmic Tester - training / awareness package reqd.

M.F

Tool reqd for the application of trial sleeving. 14/7/95

P. Miller.

Good Progress being made with m/cs - see attached - 6

Info.

Stores - Shunt recording system - spread sheet to be set-up to assist with analysis.

B.F.

Weld Conditions - Review of Pressures

No progress made in May - activities to resume when Engineers return from Japan in July.

TU/ST

Report on Data

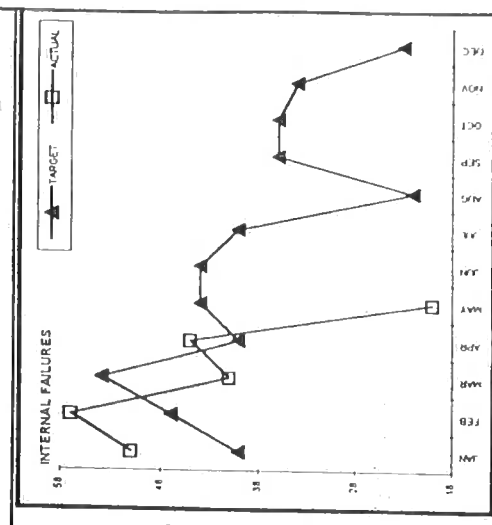
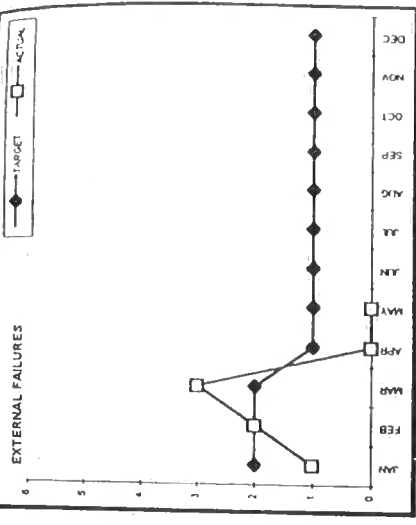
See attached sheets 7-14

Info.

Next Meeting

Thursday July 6th @ 1pm
- Project Room.

445 → Ec.



FAILURE REDUCTION	1994		1995	
	ACT.	TGT	ACT.	TGT
JAN/FEB/MAR FAILURE RATE TARGET =1994	9	40	51	
APR-DEC 5% IMPROVEMENT / MONTH	12	47	57	
1994 ACT=26	14	54	41	
1995 TGT=15	10	40	45	
1995 TARGET TO DATE = 8	30	44	20	
1995 ACTUAL TO DATE = 6	58	44		
JAN/FEB/MAR FAILURE RATE TARGET =1994	34	40	22	
APR-DEC 5% IMPROVEMENT / MONTH	6	22	36	
1994 ACT=328	30	36	36	
1995 TGT=460	44	36	34	
1995 TARGET TO DATE = 225	51	34		
1995 ACTUAL TO DATE = 214	30	23		

INTERNAL WELD FAILURE REDUCTION	1994		1995	
	ACT.	TGT	ACT.	TGT
JAN/FEB/MAR FAILURE RATE TARGET =1994	9	40	51	
APR-DEC 5% IMPROVEMENT / MONTH	12	47	57	
1994 ACT=26	14	54	41	
1995 TGT=15	10	40	45	
1995 TARGET TO DATE = 8	30	44	20	
1995 ACTUAL TO DATE = 6	58	44		
JAN/FEB/MAR FAILURE RATE TARGET =1994	34	40	22	
APR-DEC 5% IMPROVEMENT / MONTH	6	22	36	
1994 ACT=328	30	36	36	
1995 TGT=460	44	36	34	
1995 TARGET TO DATE = 225	51	34		
1995 ACTUAL TO DATE = 214	30	23		

		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TARGET	EXTERNAL WELD FAILURES	1	1	1	1	1	1	1	1
ACTUAL		0	0	0	0	0	0	0	0

		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TARGET	INTERNAL WELD FAILURES	44	44	44	40	22	36	36	34
ACTUAL		20	20	20	20	20	20	20	20
BALANCE		-13	-11	-11	-11	-11	-11	-11	-11

APPENDIX TEN

POLICY & PLANNING DOCUMENTATION: RECONFIGURATION OBJECTIVE

PRODUCTION ENGINEERING TQC

STEP 1

<u>THEME</u>	BREAKTHROUGH ACTIVITY IN LEAN PRODUCTION ENVIRONMENT
<u>SUB THEME</u>	REDUCE INVENTORY REVISE PLANT LAYOUT

STEP 2

REASON

TO ACHIEVE COMPANY POLICY ACTIVITY IN PREPARATION FOR H.S.

- a) MINIMUM CAPITAL INVESTMENT
- b) MINIMUM FLOOR SPACE

COMPANY POLICY

1997 POLICY

Bearing in mind such matters as 96 activities review, NMUK's requirements as well as the company's management objectives, the following objectives have been identified for 1997 actions.

1. In 1997, cumulative loss to be eradicated and turn overall situation to profit making.
2. To respond to NMUK's large price reduction demand, the company needs to apply itself for bigger rationalisation to become more cost competitive and resilient.
3. To realise highly effective manufacturing plant by improving technical and administrative capability and reforming manufacturing practice in order to accommodate the third model.

TARGET

1. Ordinary profit to be more than 10% of sales.
To ensure target achievement appropriate the following items in the budget :-

Material	51.5% of Sales	
Labour	21.0%	
Asset Cost	11.0%	90%
Overhead	5.5%	
Other Cost	1.0%	

2. Overall activity targets

- (1) Process ppm 999 ppm
 Press 699 ppm
 Assembly 300 ppm
- (2) Customer ppm 10 ppm
 Press 10 ppm
 Assembly 10 ppm

(3)	Press SPM Improvement	
	1200T TRF	21 SPM
	350T TRF	21 SPM
	200T TRF	26 SPM
	400T BLK	48 SPM
	200T BLK	48 SPM
	120T PRG	60 SPM

(4)	Assembly APH Improvement	Maintain 95% level
(5)	No. of delivery failures	0
(6)	No. of accidents	0
(7)	Rationalisation	More than 5% of sales

(8) Reduction of stock by half

(9) Reduction of lot-size (small batch production)
1st step = 1200 TRF 2000 pcs/run

(10) Reduction of SNP
Reduce SNP of press/sub assemblies parts to assembly cells

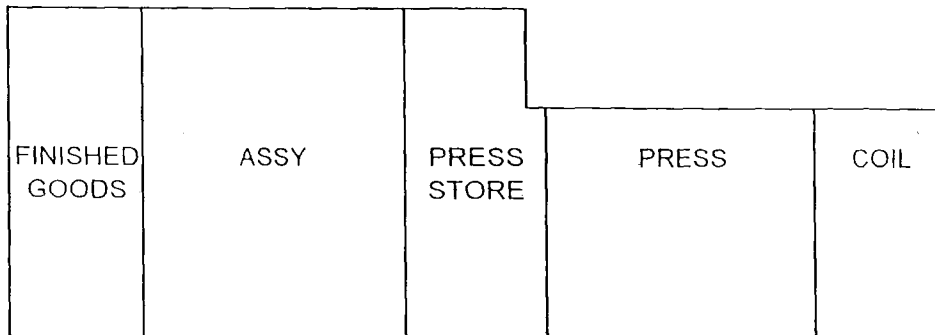
(11) Assembly cells
Change straight line formation to U-shape formation
(rationalise number of operators)

3. Other
Factory layout review to enlarge production area

CURRENT STOCK

COIL	DAYS	1320 M SQ
PRESS	DAYS	1800 M SQ
FINISHED GOODS	DAYS	2700 M SQ

FACTORY LAYOUT

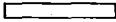





STEP 3

TARGET

<u>WHAT</u>	REDUCE STOCK
<u>WHEN</u>	PRIOR TO H.S. (DECEMBER 1998)
<u>BY HOW MUCH</u>	50%
<u>WHO</u>	ALL COMPANY

STEP 4

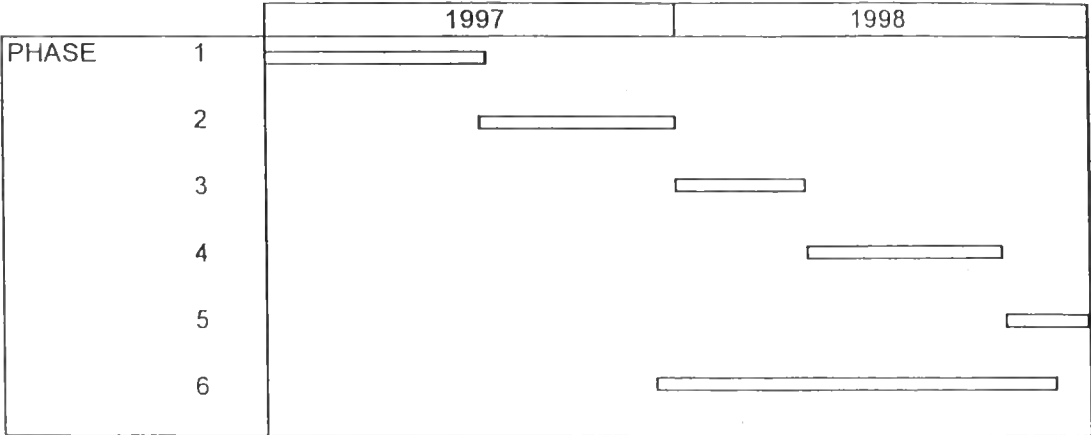
TIMING	1997	1998
PLAN	 MARCH 1997	
PHASE 1 - 5		
CONFIRM EFFECT		
HADOME		

(See Detail)

NYEL MANUFACTURING & STOCK POLICY PLAN

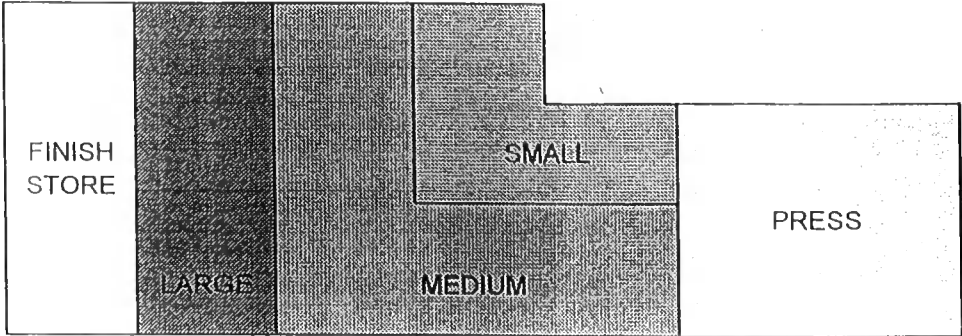
TIMING

ALL ACTIVITIES TO BE COMPLETE PRIOR TO H.S. TRIAL, DECEMBER 1998
AND GENERAL IN SIX MAJOR PHASES



PHILOSOPHY

STOCK REDUCTION BY 50% OF CURRENT & FLOW OF PART
THROUGH FACTORY SMALL ---> MEDIUM ---> LARGE WITH NO
FORMAL WORKING PROGRESS STORE

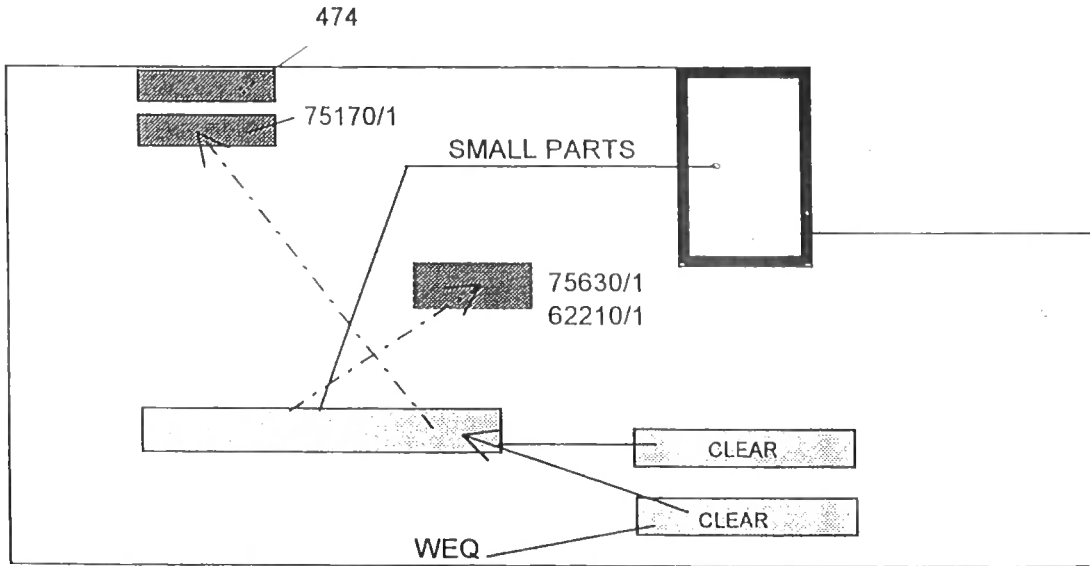


PHASE II

CLEAR 'B' LINE

- 1) CELL 474 REDUCE AREA X 50% (USE ROAD/WALL)
- 2) MOVE 75170/1 TO 'G' LINE
- 3) REPOSITION 75630 (EQ) TO RAD CORE AREA 'D' LINE
- 4) INSTALL 62210/1 (K11) TO RAD CORE AREA 'D' LINE 2 470
- 5) MOVE REMAINDER OF SMALL PARTS TO SMALL PARTS (MEZZANINE AREA)
- 6) CLEAR PRESS STORE LINES A & B TO ASSY 'B' LINE
- 7) INSTALL WEQ FACILITIES 'A' LINE PRESS STORE

NOTE! STOCK LEVELS 80% OF CURRENT



TIMING

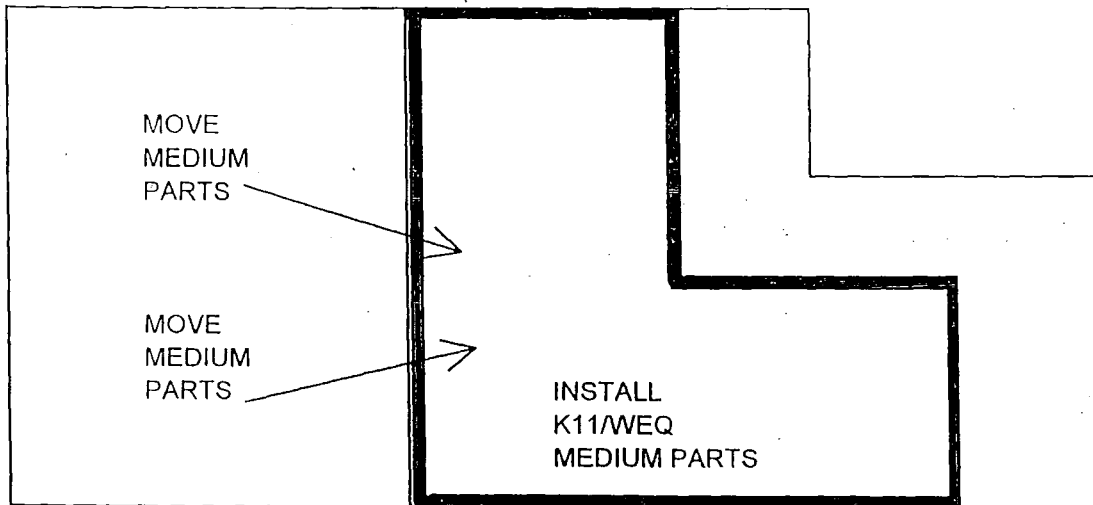
	1997	1998
1)	██████████	
2)	██████████	
3)		██████████
4)	██████████	
5)	████████████████████	
6)		██████████
7)	██████████	

PHASE III

MEDIUM PARTS TO PRESS STORE

- 1) INSTALL A & B LINE WITH K11 MEDIUM SIZE
- 2) MOVE EQ & DC MEDIUM SIZE PARTS INTO VACANT AREAS
- 3) CLEAR PRESS STORES
- 4) FILL VACANT SPACE (PRESS STORES) IN ASSY

STOCK LEVEL 70% OF CURRENT



TIMING

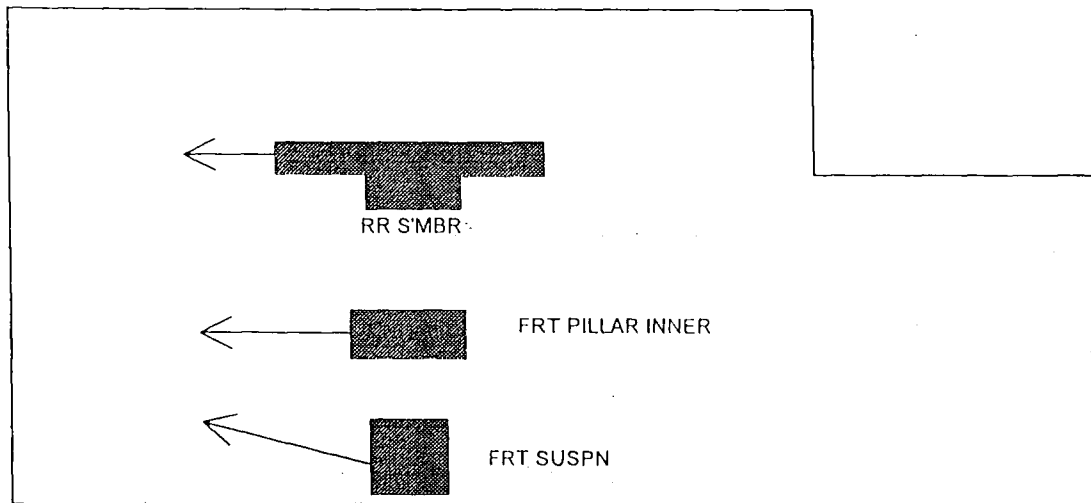
	1997	1998
1)		—————
2)		—————
3)	—————	
4)		—————

PHASE IV

LARGE PARTS TO DESIGNATED AREA

- 1) MOVE 64120/1 EQ TO LARGE AREA
- 2) MOVE DC REAR SIDE MEMBER TO LARGE AREA
- 3) MOVE DC FRONT PILLAR INNER
- 4) MAJORITY OF OTHER REMAIN BUT RATIONALISE SPACE
(SEE ATTACHED)

STOCK LEVEL 60% OF CURRENT



TIMING

	1997	1998
1)		—————
2)		—————
3)		—————
4)	—————	

PHASE V

FINAL MOVE

- 1) MOVE ALL SMALL/STATIONARY PARTS TO SMALL AREA
- 2) RATIONALISE PRESS PART SPACE

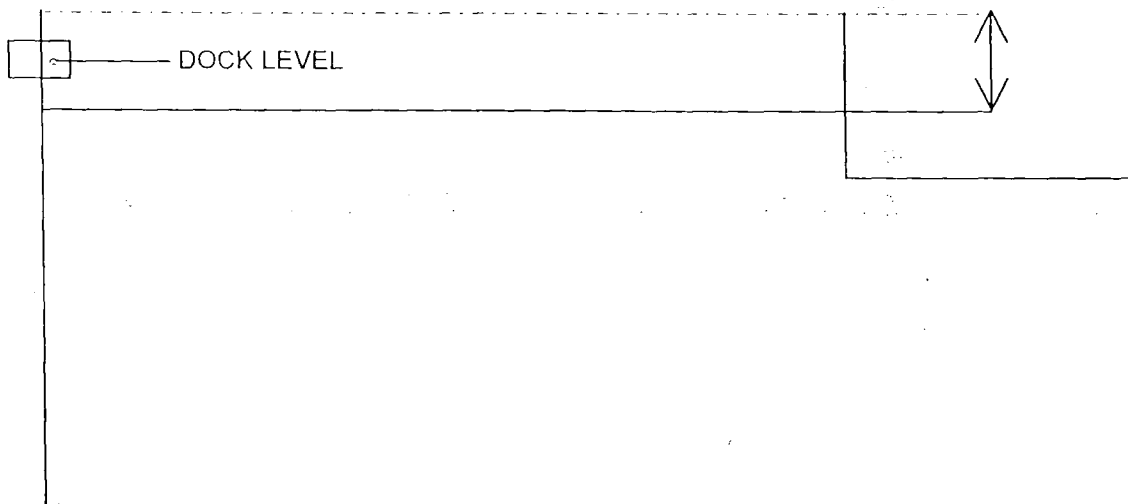
STOCK 50% OF CURRENT

TIMING

	1997	1998
1)		
2)		▬

PHASE VI

HS INSTALL



- 1) EXTEND AREA FOR DOCK LEVELLERS/STORAGE
- 2) KD UNPACKING AREA
- 3) ASSEMBLY AREA

APPENDIX ELEVEN

**PLANNING DOCUMENTATION:
CONCEPTUAL LAYOUT
CROSS FUNCTIONAL TEAM**

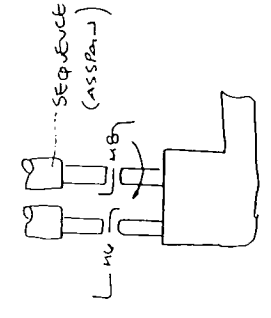
PHASE 1	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	RESPONSIBILITY
1) CLEAR END OF 'C' LINE	STOCK BUILD REPOSITION 362 472 362 SIA CELL		1 Wk					PRODUCTION CONTROL/PRODUCTION PRODUCTION ENG/PRODUCTION
2) RELOCATE DC RAD CORE	STOCK BUILD (SUBS) REMOVE SUBS MOVE FINAL ASSY		2 Wks					PRODUCTION CONTROL/PRODUCTION PRODUCTION ENGINEERING/ ENGINEERING/PRODUCTION
3) CLEAR END OF 'B' LINE	STOCK BUILD 347/370B REMOVE T/L STN REPOSITION 403/347/ 370B		1 Wk					PRODUCTION CONTROL/PRODUCTION PRODUCTION PROD ENG/PRODUCTION
4) CLEAR SERVICE AREA	REMOVE SUSPN O/SIDE REMOVE RAD CORE EC SERVICE GUARD BARS TO REWORK AREA (TEMP)							PRODUCTION/ENGINEERING PRODUCTION ENG. PRODUCTION/PRODUCTION ENG.
5) RELOCATE EQ RAD CORE	STOCK BUILD (SUBS) MOVE SUBS MOVE FINAL ASSY			2 Wks				PRODUCTION CONTROL/PRODUCTION PRODUCTION ENG/ENGINEERING/ PRODUCTION PRODUCTION ENG/PRODUCTION
6) CLEAR END OF 'A' LINE 'B' LINE PRESS STORES	MOVE TO TEMP. SPACE (EX RAD CORE)							MATERIAL HANDLING
7) CLEAR SMALL PART STORE	TEMP. MOVE TO STORE SPACE							MATERIAL HANDLING
8) CONSTRUCT MEZZANINE FLOOR						8 Wks		MCALPINES (ENGINEERING)
9) SERVICES TO MEZZANINE FLOOR	EXTEND 'G' LINE AIR, WATER, ELECT., ETC.					3 Wks		PRODUCTION ENGINEERING/ ENGINEERING
10) SERVICES TO PRESS STORE	MCALPINES					8 Wks		ENGINEERING

PHASE 2	STOCK BUILD/SHIFT	MONTHS												RESPONSIBILITY
		JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY						
1) REDUCE PROCESS CELL 474	STOCK BUILD/SHIFT REVISE LAYOUT		██████████ 3 Wks											PRODUCTION CONTROL/PRODUCTION ENGINEERING/PRODUCTION
2) RELOCATE 75170/1 2J000 TO 'G' LINE	STOCK BUILD RH STOCK BUILD LH MOVE RH MOVE LH		██████████ 2 Wks	██████████ 2 Wks	██████████ Fume Extraction									PRODUCTION CONTROL/PRODUCTION ENGINEERING/PRODUCTION
3) RELOCATE 75630 2J000 TO 'D' LINE	STOCK BUILD RELOCATE		██████████ 2 Wks	██████████ 2 Wks										PRODUCTION CONTROL/PRODUCTION ENGINEERING/PRODUCTION
4) INSTALL 62210/1 (K11) TO 'D' LINE			██████████											ENGINEERING/PRODUCTION/PRODUCTION ENGINEERING
5) MOVE SMALL PART ASSY TO SMALL PART MEZ. FLOOR				██████████										PRODUCTION
6) CLEAR PRESS STORE 'A', 'B', 'C'				██████████										MATERIAL HANDLING
7) INSTALL WEQ ASSY FACILITY INTO STORE														ENGINEERING/PRODUCTION ENG/PRODUCTION
8) INSTALL WEQ LARGE ASSY 'B' LINE														ENGINEERING/PRODUCTION ENG./PRODUCTION
9) INSTALL SMALL WEQ BENEATH MEZ FLOOR														ENGINEERING/PRODUCTION ENG/PRODUCTION

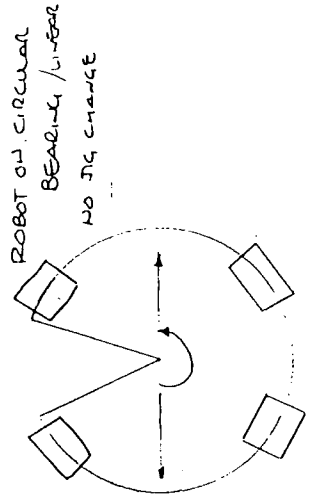
PHASES 4 & 5		MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	RESPONSIBILITY
RELOCATE SMALL ASSY CELLS	STOCK BUILD MOVE SMALL FACILITIES (18 OFF)					36 Days				PRODUCTION ENGINEERING/ PRODUCTION
RELOCATE DC RR S'MBR	STOCK BUILD RELOCATE					3 Wks				PRODUCTION ENGINEERING/ ENGINEERING/PRODUCTION
RELOCATE DC FRT PILLER INR	STOCK BUILD RELOCATE					2 Wks				PRODUCTION ENGINEERING/ ENGINEERING
RELOCATE EQ DASH REINF	STOCK BUILD RELOCATE							1 Wk		PRODUCTION ENGINEERING/ PRODUCTION
RELOCATE EQ DASH UPPER	STOCK BUILD RELOCATE								1 Wk	PRODUCTION ENGINEERING/ PRODUCTION

3 MANUAL JIG CHANGE (m)

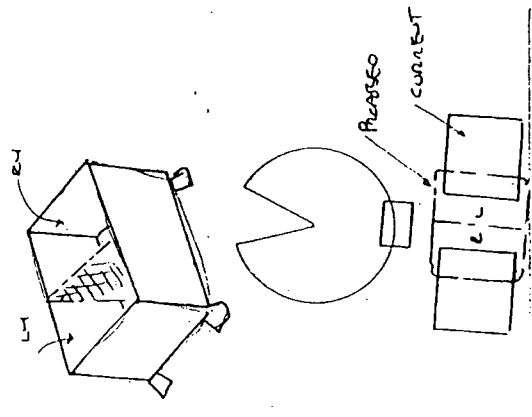
6 NUT FEEDER CURRENT MB/MG SER



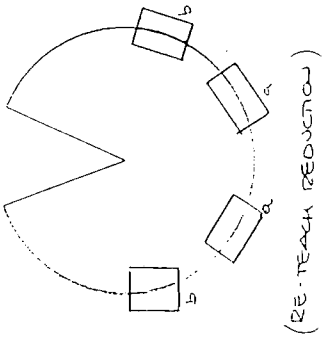
7 ROBOT DEAD SPACE



8 PRESS PANEL SLIT FOR R/LH

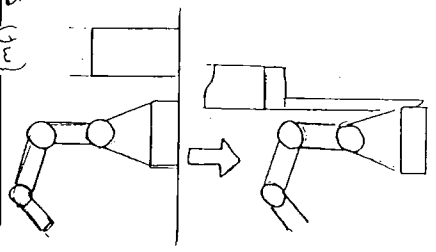


3 MANUAL JIG CHANGE (m)

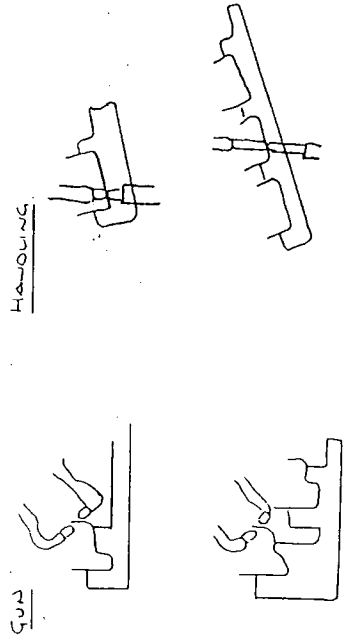


(RE-TEACH REDUCTION)

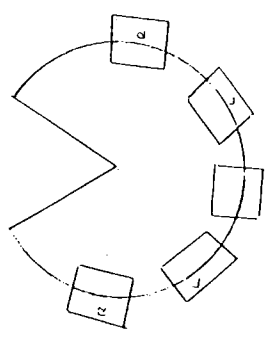
4 USING HEIGHT FOR COMMON PARTS / JIG FEEDERS (M) ETC



5 TWO PARTS / JIG (MULTI-PART)

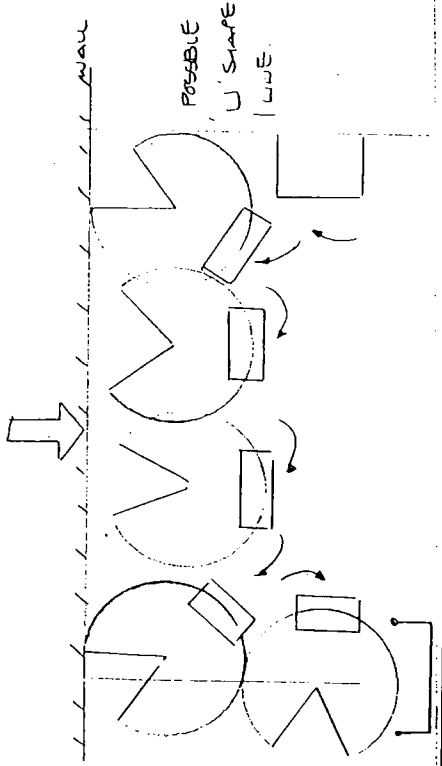
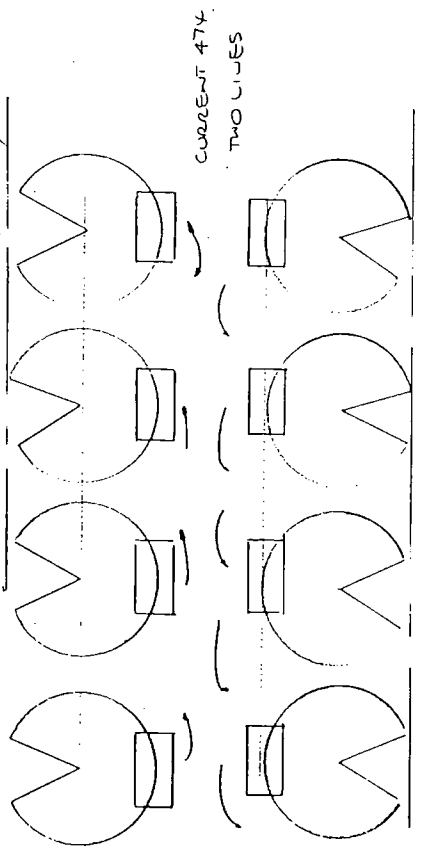


1 MULTI-JIG FACILITY

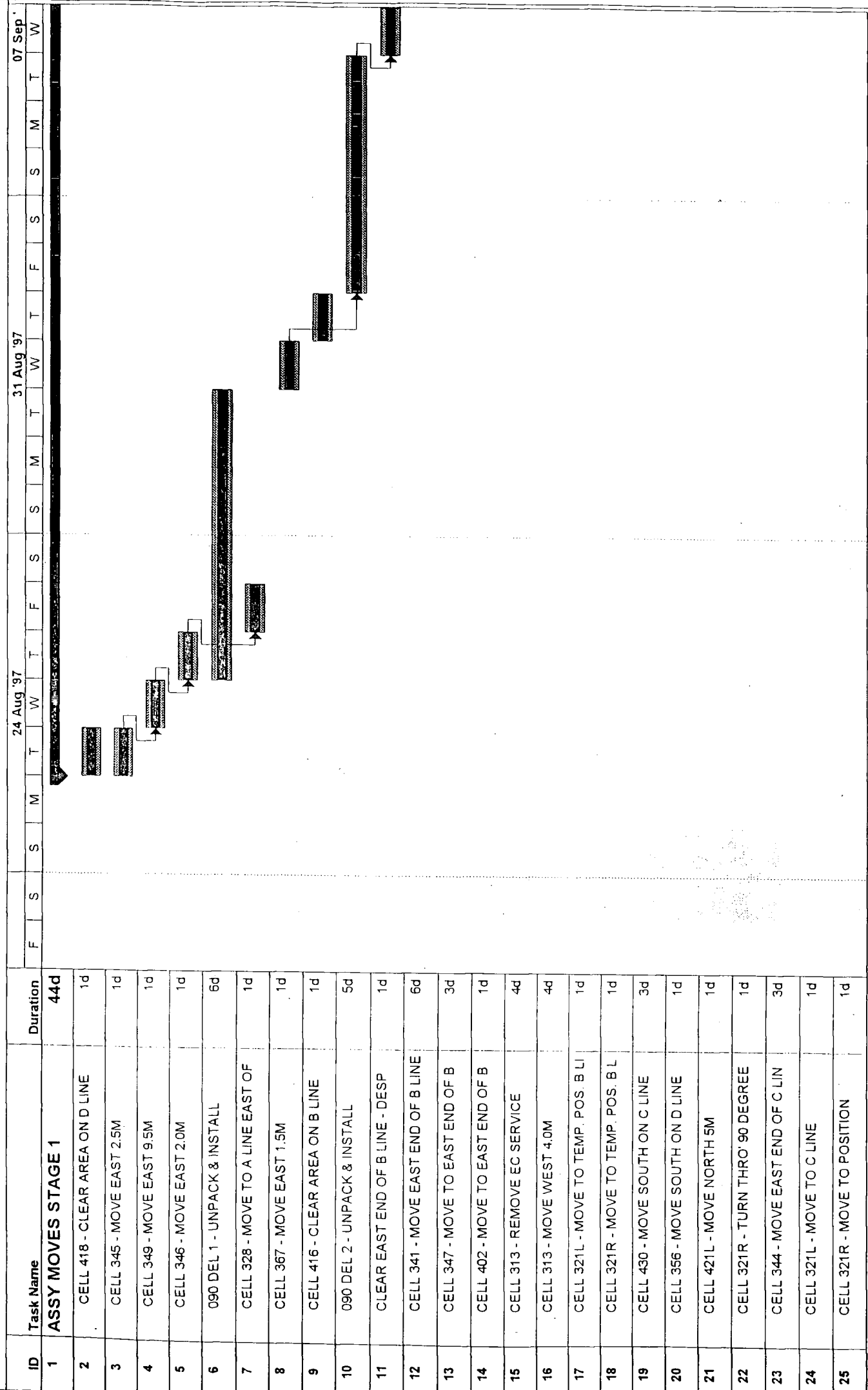


- EQ
- DC
- WEQ

2 SINGLE FACILITY



ASSEMBLY LAYOUT MOVES FOR 090 & WEQ INSTALLATION



Project: ASSYMOVE1.MPP
 Date: Tue 14/10/97

Task Progress

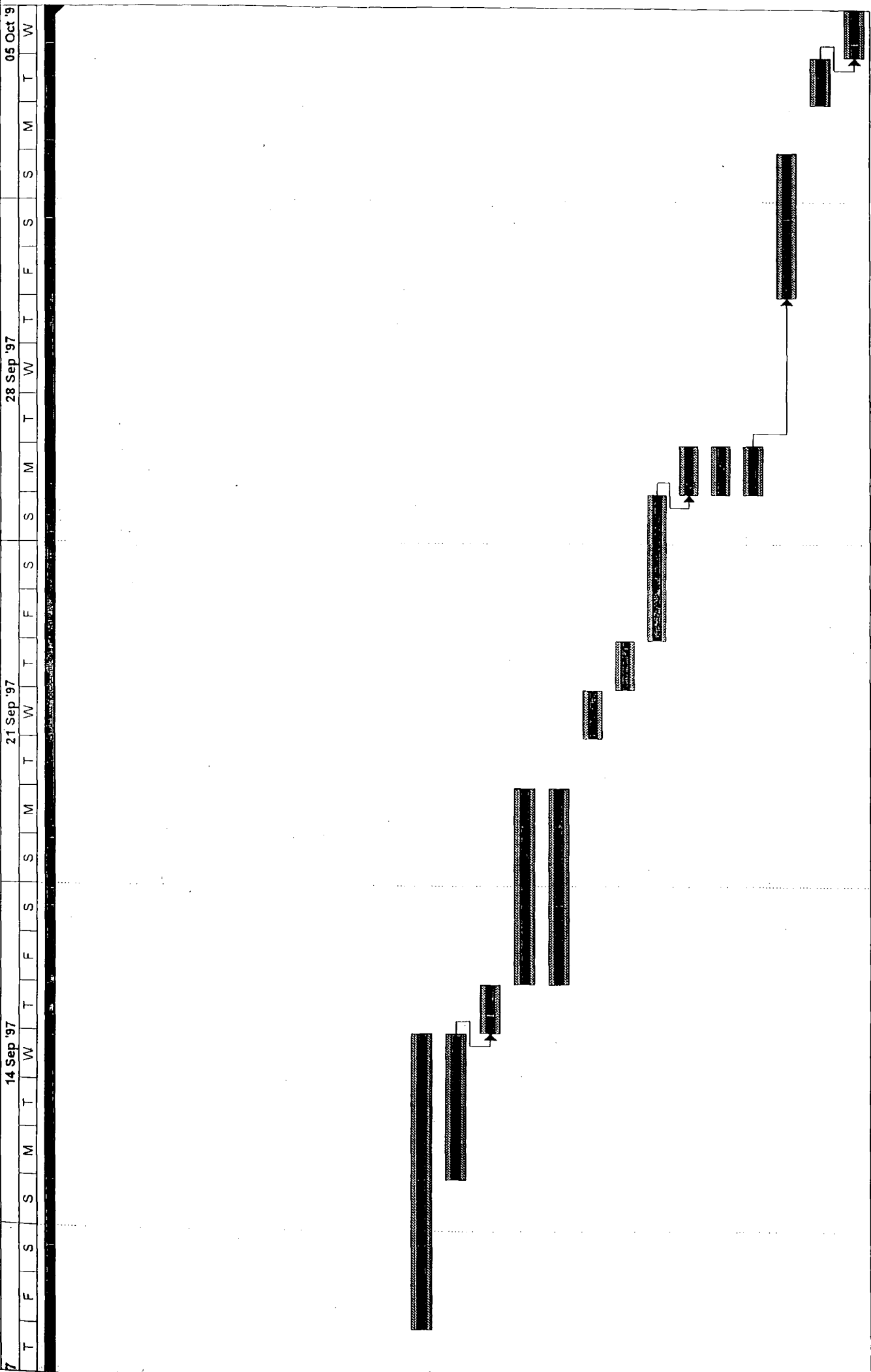
Milestone Summary

Rolled Up Task

Rolled Up Milestone

Rolled Up Progress

ASSEMBLY LAYOUT I MOVES FOR 090 & WEQ INSTALLATION



Project: ASSYMOVE1.MPP
 Date: Tue 14/10/97

Task
 Progress

Milestone
 Summary

Roll Up Milestone

Roll Up Task

Roll Up Progress

APPENDIX TWELVE

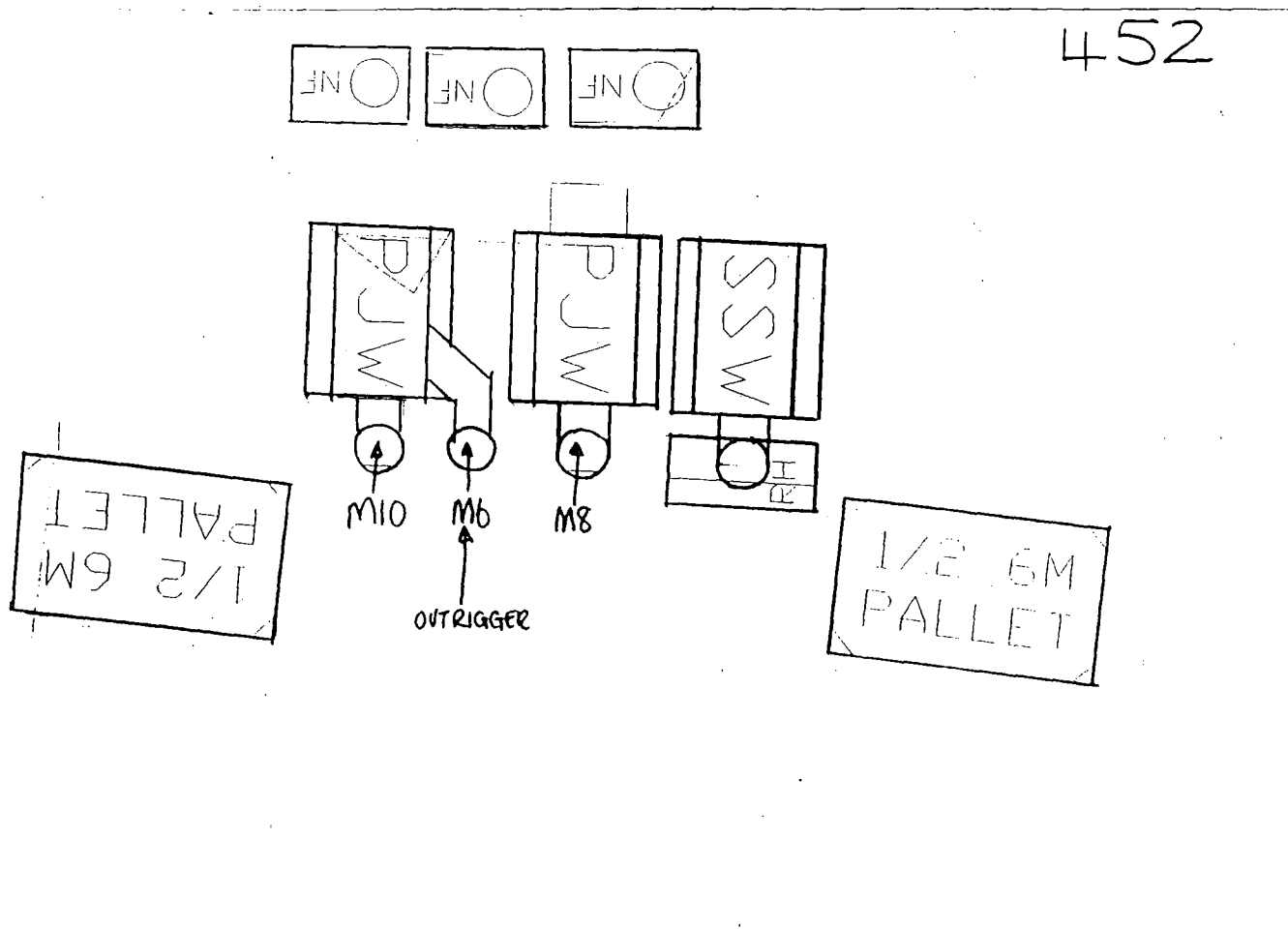
PLANNING DOCUMENTATION FOR A BOTTOM UP IMPROVEMENT: THE RECONFIGURATION OBJECTIVE

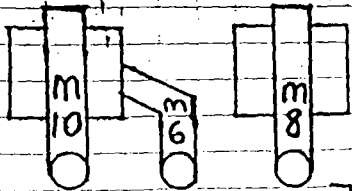
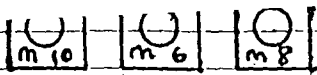
DAVE

THIS IS THE NEW PROPOSED LAYOUT FOR 452. THIS INCLUDES THE IDEA LEE TURNER HAD FOR USING AN OUTRIGGER. ON YOUR LAYOUT YOU USED 1/2 6M'S. THE CELL ACTUALLY HAS PARTS COMING INTO IT IN 3M'S AND 6M'S. THIS IN EFFECT HAS ALTERED THE SPACE WE NEED ON THE CELL.

THE LAYOUT INDICATED BELOW SHOWS OUR BEST POSSIBLE SOLUTION TO THE CELL SPACE. PLUS THE MOST EFFICIENT WAY WE CAN THINK OF TO RUN THE CELL. TAKING INTO ACCOUNT ALL OF THE NEW ASSEMBLIES WHICH WILL BE MANUFACTURED ON THE CELL. (ALL PART NUMBERS INDICATED ON THE DIAGRAM)

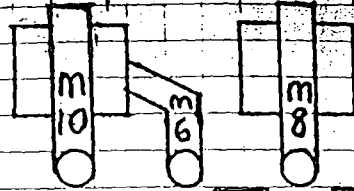
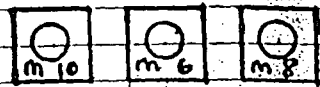
E/F LINE AISLE





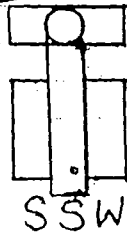
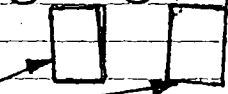
6M SPACE

ANNEX CELL
YOUT (452)
IS DESIGN
L GIVE, BEST
SIBLE OUTCOME
ING PRODUCT
OF ALL
PONENTS.

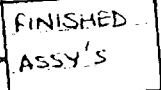
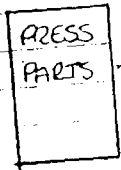
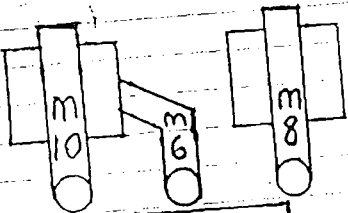
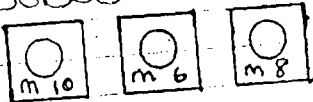


67157 52800

BOX
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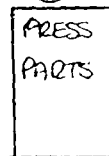
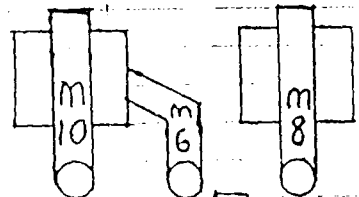


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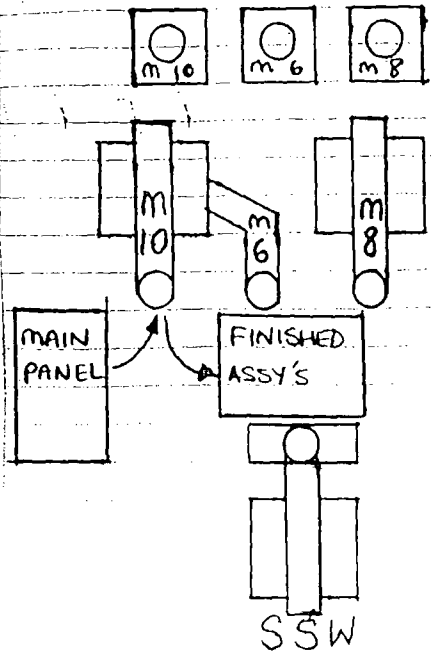


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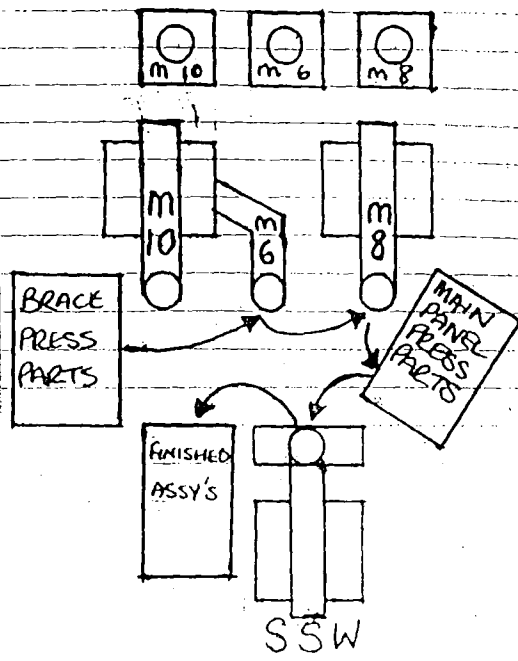
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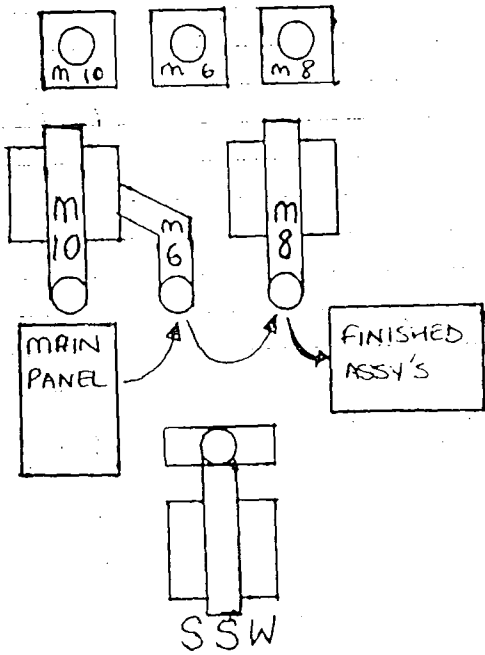
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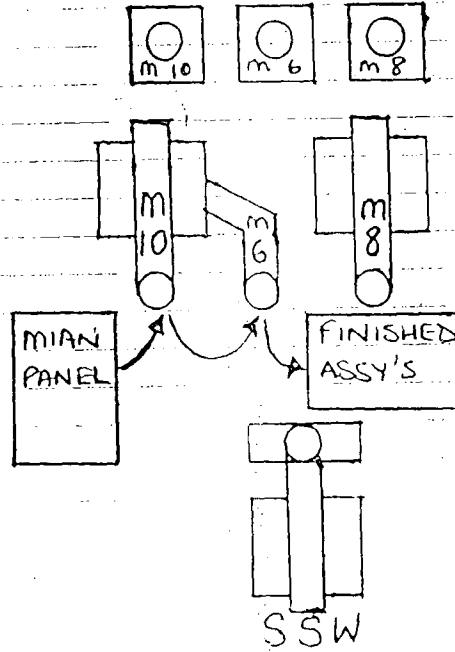
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