

1 **An international review of the challenges associated with securing**
2 **'buy-in' for water safety plans within providers of drinking water**
3 **supplies**

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11 **ABSTRACT**

12
13 Since publication of the 3rd Edition of the World Health Organisation (WHO) Drinking
14 Water Quality guidelines, global uptake of water safety plans (WSPs) has been
15 gathering momentum. Most guidance lists managerial commitment and 'buy-in' as
16 critical to the success of WSP implementation; yet the detail on how to generate it is
17 lacking. This review discusses aspects of managerial commitment to WSPs. We
18 argue that the public health motivator should be clearer and a paramount objective,
19 not lost among other, albeit legitimate, drivers such as political or regulatory
20 pressures and financial efficiency.

21
22 **Keywords:** advocacy, commitment, public health, risk management, water safety
23 plans

24
25 **Running header:** Management buy-in for water safety plans

1 INTRODUCTION

2

3 2004 was a key year for the promotion of water safety plans (WSPs), a preventative
4 catchment to consumer risk management approach for the provision of safe drinking
5 water, as the limitations of end product testing were realised (O'Connor 2002; Rizak
6 *et al.* 2003). Though related approaches, such as the hazard analysis and critical
7 control points (HACCP) methodology (Deere & Davison, 1998; Gissurason &
8 Thoroddsson, 2000; Hellier, 2003) had previously been used, the revised WHO
9 guidelines for drinking water quality, the International Water Association's (IWA)
10 Bonn Charter for safe drinking water, and before them, the Australian guidelines for
11 drinking water quality, placed a renewed emphasis on preventative risk management
12 (WHO, 2004a; IWA, 2004; NHMRC, 2004). Such methods are rapidly being
13 implemented across the globe (Table 1).

14 There have been criticisms of using the HACCP approach for the supply of drinking
15 water as discussed in Hamilton *et al.*'s (2006) commentary on water safety initiatives
16 in the context of water utility risk management, mainly that:

- 17 • HACCP is concerned with hazards and not risk – there is no (semi)
18 quantitative analysis of the risk posed by each hazard.
- 19 • Transferring the Critical Control Point (CCP) aspect to water can be difficult –
20 what is critical?
- 21 • CCPs and critical limits can only be readily applied to the treatment process,
22 and not the raw water catchment and distribution system, making a source to
23 tap HACCP plan difficult.
- 24 • There is a risk of identifying hazards retrospectively to suit existing controls.

- 1 • HACCP methodologies can become exercises in documentation rather than a
2 risk management approach.

3 However, the HACCP approach is intended to be flexible, and integration with other
4 standards such as ISO 9001 (2004) and AS/NZS 4360 (AS/NZS, 2004) can
5 overcome these shortcomings. Hrudey & Hrudey (2004) recognised that the HACCP
6 principles can provide a useful foundation for a broader approach. Havelaar (1994)
7 identified the limitations of HACCP for the whole supply chain due to a lack of direct
8 control over source water catchments and at the customer tap, and argued that
9 surveillance of steps in the abstraction of water, or in the distribution system for
10 example is essential in defining critical limits for the true CCPs in the treatment
11 process.

12 The objectives of a WSP are to prevent contamination of raw water sources, treat
13 water to remove contamination and prevent re-contamination during storage
14 distribution and handling. The primary aim is to protect public health through system
15 assessment, operational monitoring and management plans; guided by health-based
16 targets and overseen by surveillance (Davison *et al.* 2005). One aspect that most
17 WSP guidance and case studies agree on is that 'buy-in' from across the lead
18 organisation, and particularly senior management, is imperative to successful
19 implementation (WHO, 2004a; IWA, 2004; NHMRC, 2004; Godfrey & Howard,
20 2005).

21 A research interest in risk analysis tools and risk management frameworks within the
22 water sector has been developed (MacGillivray *et al.*, 2006; Pollard, 2008;
23 MacGillivray & Pollard, 2008). These are a necessary but insufficient basis, in
24 isolation, for improved vigilance on the ground. Our recent studies confirm that the

1 organisational infrastructure of risk champions, risk management committees and
2 risk registers is also insufficient unless embedded within a culture of sound
3 organisational risk governance. One utility manager noted (Pollard *et al*, 2007) “*I*
4 *think that one of the main barriers is convincing senior managers – they have to buy*
5 *into [preventative risk management]”*. In our experience, organisational commitment
6 to the safe drinking water agenda cannot be taken for granted as a priority. We
7 recognise that utility managers manage several competing priorities. However,
8 without executive commitment, WSP development may inadvertently become a
9 token gesture and not fulfil its potential. Hellier (2003) noted, in describing the
10 application of HACCP in a water company, that even the best management systems
11 do not deliver safe water alone; well trained people committed to the protection of
12 public health will always be essential. This paper considers why such commitment is
13 important; taking into account issues of leadership and organisational culture. We
14 examine why buy-in is often so challenging and emphasise the importance of
15 leadership in public health to the delivery of preventative risk management. We
16 reconsider the fundamental aim of WSPs - the public health imperative - and how
17 this responsibility is expressed in the basic business assumptions of water suppliers.
18 In doing so, we reflect on other fields such as organisational health and safety. Our
19 comments follow recent studies that have explored risk management maturity in
20 water utilities (Dalglish & Cooper, 2005; MacGillivray, 2006) and the concept of
21 ‘mindfulness’ within the water sector (Pollard *et al*. 2008a). Both we regard as
22 essential and are dependent on organisational commitment and effective utility
23 leadership.

1 *Table 1. WSP initiatives around the world*

Country/ Region	Title/Summary	Reference
Australia	Australian drinking water guidelines, Framework for Management of Drinking Water Quality, recommend risk-management approach to water quality management based on HACCP, ISO 9001 and AS/NZ 4360. Risk management plans are a regulatory requirement in some states (Victoria)	NHMRC: http://www.nhmrc.gov.au
Bangladesh	Development and implementation of WSPs for small water supplies in Bangladesh': Case study from describing how WSPs can be developed and implemented for small systems in developing countries. Describes development of simplified tools for community use.	Mahmud, Shamsuddin, Ahmed, Davison, Deere, Howard (2007) <i>Journal of Water and Health</i> 5 (4) 2007
Europe	European Commission Drinking Water Directive - working group providing guidance to the EC on how to integrate the WSP concept into revised legislation	European Commission (2008) http://ec.europa.eu/environment/water/water-drink/
Europe	TECHNEAU, an integrated project funded by the European commission, challenges the ability of traditional system and technology solutions for drinking water supply to cope with present and future global threats and opportunities. Work Area 4 is focusing on risk management	http://www.techneau.org
Europe	Water Safety Plans in Pictures' A WECF initiative to provide tools to schoolchildren and local communities in rural Europe to improve water safety based on WHO WSP methodology	WECF (2008) http://www.wecf.eu
Hong Kong	Water Safety Plan for Water Supplies Department developed in 2005, implemented in 2007	Government of Hong Kong http://www.wsd.gov.hk
Iceland	HACCP and water safety plans in Icelandic water supply: Preliminary evaluation of experience	Gunnarsdottir & Gissurarson (2008) <i>Journal of Water and Health</i> 6 (3)

India	Case study of Water Safety Plan development in Guntur, India according to WHO guidelines	Godfrey & Howard (2005)
Japan	Japan's trial introduction of HACCP into water quality management' Investigation into a practical procedure in introducing the HACCP into water quality management in Japan	Yokoi, Embutsu, Yoda & Waseda (2006) <i>Water Science & Technology</i> 53(4-5) 483-492
Latin America	'WaterPlus' Partnership between PAHO, CDC and EPA to implement WSPs in Latin American and Caribbean countries	http://www.cdc.gov/nceh/globalhealth/projects/waterplus.htm
New Zealand	Public Health Risk Management Plans regulatory requirement for supplies to more than 500 people under The Health (Drinking Water) Amendment Act 2007 and encouraged for smaller supplies through guidance.	http://www.moh.govt.nz/water
Pacific Islands	Pacific Water Safety Plans Programme to implement WSPs in Pacific Islands - Joint programme with SOPAC, WHO and IAS, funding from AUSAid	http://www.sopac.org/Water+Safety+Plan
Portugal	Water Safety Plans: methodologies for risk assessment and risk management in drinking water systems. Book chapter giving overview of first 2yrs implementing WSPs in Portuguese water company, demonstrating value of the methodology.	Viera, JMP (2007) <i>Water in Celtic countries: quantity, quality and climate variability</i> 310-317
South Africa	Annex C of South African National Drinking Water Standard (SANS 241) sets out a guideline recommending implementation of WSP approach	http://www.dwaf.gov.za/
Taiwan	Integrated water management plans towards sustainability: the Taiwan experience. Water Safety Plan, was developed as the "Green Blue-Print" for the development of strategies and guidelines of national sustainable water environment	Chiang, Chang & Huang. <i>Water Science and Technology: Water Supply</i> 7 (2) 31-40
Uganda	Case study of Water Safety Plan development in Uganda according to WHO guidelines	Godfrey & Howard (2005)
UK	Funding for improvement plans under PR09 will only be considered if identified through the WSP approach, and 2007 amendments to Water Supply (Water Quality) Regulations 2000, state that risk management plans should be developed for each supply system	http://www.dwi.gov.uk/

1 **A RATIONALE FOR WSPs**

2

3 884 million people (13% of the global population) lack access to improved water
4 supplies, whilst 1.8 million deaths occur annually from diarrhoeal disease, mostly in
5 developing countries and attributable to contaminated water supplies
6 (WHO/UNICEF, 2008). Millions more become ill through water-related diseases
7 such as hepatitis A, parasites, arsenic poisoning and fluorosis, some of which are life
8 threatening (WHO, 2004b). Disease outbreaks are not restricted to less developed
9 countries. Hrudey & Hrudey (2004) documented over 60 case studies of waterborne
10 pathogen outbreaks in affluent nations from the last 30 years, analysing the causes
11 of these failures in order to draw out insights that might prevent future ones. They
12 caution against viewing public health protection as equivalent to other business
13 priorities and offer guiding principles for the provision of safe drinking water
14 developed from recurring themes from past outbreaks (Hrudey & Hrudey, 2004):

- 15 • Pathogens pose the greatest risk (pathogen removal and disinfection should
16 be of paramount concern).
- 17 • Robust, effective multiple barriers to drinking water contamination are needed
18 based on the contamination challenge to the raw water source.
- 19 • Trouble is preceded by change, so change should be taken as a warning.
- 20 • Operators must be capable and responsive.
- 21 • Drinking water professionals must be accountable to drinking water
22 consumers.
- 23 • Ensuring safety is an exercise in risk management, requiring sensible
24 decisions in the face of uncertainty.

1 Whilst the WSP concept has been familiar for some years in high and middle income
 2 countries, WSPs *per se* are still not common, and in low income countries are rare.
 3 Many water suppliers argue they have been managing risk in this way for years, yet
 4 outbreaks and accidents continue in spite of reports identifying the reasons behind
 5 such events. In the UK for example, we have witnessed a number of
 6 *Cryptosporidium* incidents, with boil notices issued (Table 2) despite
 7 *Cryptosporidium* risk assessments being a regulatory requirement since 1999 (DWI,
 8 1999) and the active promotion of WSPs since 2004 (DWI, 2004).

9

10 *Table 2: Publicised Cryptosporidium incidents in the UK 2005-2008 (BBC, 2009)*

Location	Date	Details
North Wales	August 2008	45,000 people issued boil water notice following increase in <i>Cryptosporidium</i>
Northampton	June 2008	250,000 people issued boil water notice following contamination of water.
Catterick Garrison	Dec 2007	Boil water notice for military area and 2000 residential properties following contamination.
Scotland	Summer 2007	Several Scottish towns issued with boil water notices following detection of cryptosporidium over summer months
Norfolk	Jun 2007	6000 households told to boil water
North Wales	Nov 2005	231 cases of cryptosporidiosis. 70,000 homes told to boil water for 2 months.

11

12

1 **MANAGERIAL COMMITMENT AND 'BUY-IN'**

2

3 In developed countries, WSPs assist in refining operating procedures, raising
4 awareness of the causal agents of waterborne disease, and establishing investment
5 priorities (Rouse, 2007); yet despite the benefits, organisational buy-in can be
6 elusive. WSPs may be misconstrued as bureaucratic exercises in auditing unit
7 processes, as an imposed regulatory burden, or as 'another head office initiative'.
8 Preventative risk management, by its very nature, should deliver fewer adverse
9 incidents, but because tangible operational evidence for this can be scarce especially
10 when operations appear to be running normally, investment may be hard to justify. A
11 recent IWA survey (Zimmer & Hinkfuss, 2007) discusses a range of barriers that
12 prevented water suppliers implementing WSPs effectively, such as a lack of skills,
13 knowledge and finance, poor institutional arrangements, and uncertainty over how
14 best to implement them. This uncertainty may result in an unwillingness to invest in
15 WSP development. Reasons for this resistance (Zimmer & Hinkfuss, 2007) include:

- 16 • More work for staff.
- 17 • Competition with other projects.
- 18 • Resistance to change/cultural barriers.
- 19 • Cost/time constraints and,
- 20 • An absence of upfront investment, with a lack of demonstrable outcomes.

21 In response, the IWA is developing a toolbox of resources that will assist utilities in
22 overcoming these barriers and implementing the aims of the Bonn Charter,
23 specifically WSPs (Pollard *et al*, 2008b).

1 Existing WSP Guidance

2 Rudimentary attempts have been made at guiding utility managers on the benefits of
3 WSPs. The WHO publication *Water Safety Plans* (Davison *et al.*, 2005) offers some
4 arguments that senior managers may find attractive in the WSP concept, such as the
5 demonstration of best practice application, potential savings and improvements in
6 asset management. The guidance is concise and managers may require a more
7 developed rationale. A revised draft WSP manual acknowledges “*acquiring senior*
8 *management commitment may be achieved by providing clear and coherent*
9 *arguments about why the adoption of a WSP is important and advantageous to the*
10 *organization*” (WHO, 2008). The Australian guidelines for the management of
11 drinking water quality (NHMRC, 2004) suggest actions such as WSP policy
12 production, communication and engagement of stakeholders as demonstration of
13 commitment. Godfrey & Howard (2005) offer suggestions to those in developing
14 countries promoting benefits such as cost savings, the demonstration of best
15 practice, and quality assurance versus quality control. Helpfully, these authors offer
16 a decision tree for promoting the case for WSP development. One might argue,
17 however, that listing benefits such as cost savings first, though of added value, might
18 detract from the primary aim of WSPs, the protection of public health.

19

20 Notwithstanding the useful pointers above, there remains a lack of documented
21 evidence that describes what attributes and actions of leaders might instil the
22 enthusiasm and competency of their workforce and relevant stakeholders to be
23 mindful, and proactively manage risk. This raises a broader, and arguably, a more
24 fundamental issue of the differing motivations between the various stakeholders
25 associated with WSPs, and of those within any single stakeholder group. For

1 example, in the context of low-income countries, public health and water quality are
2 often the main drivers of national Governments, public health professionals and
3 organisations such as the WHO. For donor organisations, water quantity is often
4 emphasised, especially in emergency and relief contexts: *“in the initial phase of a*
5 *disaster, quantity is more important than quality”* (Sphere, 2004). For implementers
6 of projects, completion within budget and time are often the main drivers. For the
7 collectors of water, invariably women and children, improved access is the primary
8 concern, whereas for men, water quality is paramount (Webster, 2006). Similar
9 differences occur within organisations in developed countries: the vision of public
10 health may originate with leaders, but managers are under pressure to deliver the
11 corporate vision to budget and time, and field implementers may be more concerned
12 with quality and service. The danger is that with these competing perspectives, the
13 rationale and vision for WSP implementation may get diffused.

14

15 **Leadership and organisational culture**

16 Setting the right tone at the top of an organisation has a marked influence on an
17 organisational culture of risk management. Tolbert & Zucker (1996) identify three
18 stages for the implementation of a new practice, for example WSPs:

- 19 1. ‘Pre-institutionalisation’, where there are few adopters and limited knowledge.
- 20 2. ‘Semi-institutionalisation’, where knowledge of the practice is widely diffused
21 but it has a short history and is not yet permanent, possibly with a ‘fad’ quality.
- 22 3. ‘Full institutionalisation’, where the practice is efficient and necessary.

23 One could argue that WSPs within the global water sector are in the semi-
24 institutionalisation stage (2). What happens during this stage determines whether
25 the practice becomes institutionalised, or forgotten as a ‘fad’. Tolbert & Zucker

1 (1996) are clear that acceptance of a new practice as the norm is strongly affected
2 by the actions of management.
3
4 Managerial commitment extends beyond the supply of resources. Leadership
5 influences the organisational culture of risk management. Schein (2004) defined
6 organisational culture as “*a pattern of shared basic assumptions that the group*
7 *learned as it solved its problems of external adaptation and internal integration, that*
8 *has worked well enough to be considered valid and, therefore, to be taught to new*
9 *members as the correct way you perceive, think, and feel in relation to those*
10 *problems*”. More simply, the attitudes, experiences, norms, beliefs and values of an
11 organisation. Webster (2006) emphasises the distinction between explicit and
12 implicit culture, and the need to move towards explicit culture with regards the
13 development of WSPs. Given the challenges of implementing any change within a
14 sector with skills shortages and the loss through retirements of corporate expertise,
15 the consideration of organisational culture is gaining attention among bodies seeking
16 to implement effective risk management (Pollard *et al.*, 2008a; MacGillivray &
17 Pollard, 2008).
18
19 PricewaterhouseCoopers (PWC) recently undertook a risk culture survey suspecting
20 that less than optimal cultures hinder a company’s risk management practices
21 (PWC, 2003). The concern expressed is that any organisation can ‘go through the
22 motions’ of risk assessment, or by extension, produce a WSP, but to be truly
23 effective the whole organisation must be behind the implementation. PWC (2003)
24 identify key points that indicate cultural problems within an organisation:

- 1 • A lack of awareness and understanding of business risks throughout the
- 2 enterprise.
- 3 • Business risks and control perspectives at the 'top' not linked to perspectives
- 4 of people on the 'front lines'.
- 5 • An inability to operationalise risk management strategies through action plans
- 6 that align key business initiatives with systemic risks.
- 7 • Improper ethics and compliance practices.
- 8 • 'People strategy' not working well.

9 These problems are inherently linked to what management researchers refer to as
10 the 'tone at the top'. To change cultural attitudes that have become embedded
11 within an organisation for many years is not easy, but organisations can make steps
12 to improve it through effective leadership (Schein, 2004). In his studies of culture
13 and organisational incidents, Reason (1998) argues that by changing aspects such
14 as the structures, practices, policies and procedures within an organisation, beliefs,
15 attitude and norms can be attuned. However, it should be noted here that is also a
16 reciprocal relationship between culture and social interaction (Webster, 2006). Much
17 can be learnt from the activities of high reliability organisations (HROs). HROs, such
18 as nuclear power plants, navy submarines and air traffic control centres have few
19 accidents (Roberts & Bea, 2001). Investigations into their management culture
20 reveal important insights for water utilities seeking to progress towards best practice
21 (Bradshaw & Pollard, *in press*). Leaders within HROs recognise that human error
22 occurs, but also that human variability and an ability to adapt to changing events is
23 an important safeguard. These organisations focus on systems at large, seeking to
24 remove error promoting properties through (Reason, 1998):

- 25 • Establishing of an effective reporting culture.

- 1 • Analysing in detail the occurrence of incidents and close calls to uncover the
 - 2 recurrent 'error traps'; and
 - 3 • Striving to imagine new scenarios that could occur and protect against these.
- 4 These features contribute to developing a 'mindful' organisation; one that has a
- 5 collective preoccupation with the possibility of failure and its root causes, has a
- 6 reluctance to oversimplify, is sensitive to operations, committed to resilience and
- 7 deferential to expertise (Weick & Sutcliffe, 2006). Hrudey *et al.* (2006) developed
- 8 these ideas to suggest elements that water utilities may wish to consider when trying
- 9 to develop mindfulness:
- 10 • Informed vigilance actively promoted and rewarded.
 - 11 • An understanding of the entire system, its challenges and limitations are
 - 12 promoted and actively maintained.
 - 13 • Effective, real-time treatment process control, based on understanding critical
 - 14 capabilities and limitations of the technology, is the basic operating approach.
 - 15 • Fail-safe multi-barriers are actively identified and maintained at a level
 - 16 appropriate to the challenges facing the system.
 - 17 • Close calls (near misses) are documented and used to train staff about how
 - 18 the system responded under stress and to identify what measures are needed
 - 19 to make such events less likely in the future.
 - 20 • Operators, supervisors, lab personnel and management all understand that
 - 21 they are entrusted with protecting the public's health and are committed to
 - 22 honouring that responsibility above all else.
 - 23 • Operational personnel are afforded the status, training and remuneration
 - 24 commensurate with their responsibilities as guardians of the public's health.
 - 25 • Response capability and communication are improved.

- 1 • An overall continuous improvement, total quality management mentality
2 pervades the organisation.

3

4 Within strong cultures, members exhibit an alignment of organisational values;
5 whereas weak cultures show little alignment and control must be exercised.

6 However, it would be inappropriate to assume that ‘one size fits all’, and some
7 influences within an organisational culture have less impact on change than others
8 (Schein, 2004). Retaining a challenge function is also critical, for without it, a
9 reduced capacity for innovative thought, so called ‘group-think’ (Janis, 1971) might
10 develop.

11

12 In stressing the need for commitment, we do not suggest the sector is not committed
13 to public health protection; rather that it requires a renewed visibility. We seek to
14 avoid a ‘badge on the wall’ mentality for WSPs, which has been associated with the
15 inappropriate implementation of procedures such as HACCP and ISO 9001 for
16 example (Hamilton *et al* 2006). Kostova & Roth (2002) discuss the ‘ceremonial
17 adoption’ of a practice, which occurs where a practice is implemented but employees
18 do not believe in its true value, and thus results in a low level of ‘internalisation’. This
19 may occur where there are regulatory pressures to implement, yet the practice
20 appears contrary to the organisational beliefs and values; for example, where a
21 regulator stipulates that WSPs should be produced, yet the culture of the water
22 supplier is rooted in compliance testing alone. Internalisation is vital for staff,
23 because positive perceptions of improvement impact on implementation as well as
24 ensuring longer term institutionalisation (Kostova & Roth, 2002). It is here, in

1 internalising WSPs within the organisation, where we believe managerial
2 commitment is vital.

3

4 We perceive two problems for utility managers seeking to secure executive support
5 for WSPs: (i) the lack of guidance on developing a compelling narrative that will
6 secure buy-in; and (ii) an absence of what true commitment looks like. Mahmud *et*
7 *al.* (2007) describe the successful implementation of WSPs in community-managed
8 supplies in Bangladesh; systems traditionally challenged by the use of untrained
9 community members to operate the water supply. The authors detail how the WSP
10 was developed, but less so on how commitment was generated. The first stage of
11 development was a conference where the discussions on the importance of WSPs
12 took place and this “*resulted in a firm commitment from all stakeholders to implement*
13 *WSPs in rural water supplies in Bangladesh*”. A number of questions arise:

- 14 • What were the important aspects of WSPs that generated this commitment?
- 15 • Who were the stakeholders involved?
- 16 • Were the community operators involved at this point?
- 17 • What constituted *firm commitment*?

18 Following success of a pilot project, evidence could be used to generate more
19 commitment using this example through regular interaction and sharing of
20 information between organisations undertaking WSPs in Bangladesh (Mahmud *et*
21 *al.*, 2007). The draft WSP manual (WHO, 2008) includes a number of case studies,
22 one of which in Kampala Uganda, briefly mentions managerial commitment, sought
23 via an initial briefing with senior management to discuss the benefits of a WSP.
24 Again, detail on the mechanisms and demonstration of commitment is limited.

25

1 These examples, both from developing countries, benefited from external funding
2 and/or expertise in the form of research projects, and future commitment could have
3 been generated by the implementation phase. Commitment may not be so easy to
4 get in an organisation with little money, or prior to undertaking such a project.
5 Gregor (2007) comments on the importance of local commitment and buy in when
6 implementing WSPs in developing countries, where the driver comes from external
7 aid agencies and non-governmental organisations (NGOs). Commenting on WSP
8 implementation in the Pacific Islands, Gregor (2007) describes the aim enhancing
9 local capacity and involving governments in water safety planning so that when
10 external agencies leave, a legacy of local ownership and sustainability is secured.
11 Local commitment was developed through participative workshops, and one-on-one
12 training for water utilities with experts. Similarly, reflecting on the development of a
13 WSP in the Caribbean (*personal communication*), senior managers at the water
14 authority and key stakeholders were not engaged until the end of the process, which
15 then proved difficult. Had regular meetings with senior management been
16 incorporated, buy-in to the recommendations from the plan may have been easier to
17 secure.

18

19 From developed nations, there is limited reference to managerial commitment in the
20 case study literature. Mullenger *et al* (2002) describe the experience of South East
21 Water Limited, Australia, in implementing HACCP plans for drinking water. They
22 document a wide range of benefits for the organization, such as a greater
23 understanding of water quality issues, more streamlined work procedures and
24 improved customer responses, giving rise to a reduction in the number of complaints
25 received. Initial managerial commitment is not discussed, but it was noted that “*the*

1 *initial reaction of most staff to the implementation of HACCP was not favourable”.*

2 Although these attitudes changed towards the end of the project, little detail was
3 given on attempts to secure commitment at the outset, and the role that senior
4 managers played.

5

6 **LESSONS FROM OTHER FIELDS**

7

8 There is a substantive literature on safety culture relevant to this discussion. In
9 considering safety culture, Hopkins (2005) argues that creating the right mindset
10 among employees is ultimately an issue of managerial commitment. Woerner (1996)
11 also comments, "*Without true management commitment and visibility throughout the*
12 *operation, the safety program will never reach its greatest potential”.* Cooper (2006),
13 and Gyeke & Salminen (2007), demonstrated a close correlation in workplace safety
14 perception and the perceived support from management. Flin (2003) suggests once
15 managers are committed, they should regularly check this commitment is
16 communicated to their employees through surveys of perceptions and upward
17 appraisal; so-called ‘climate surveys’. Fernandez-Muniz *et al.* (2007) showed that
18 managers influence the safety culture of employees in two ways: indirectly through
19 support and funding for implementation and development of a safety management
20 system; and directly through positive attitudes and behaviours. They argue that
21 positive words in formal declarations are insufficient to modify employee behaviour,
22 and so managers must become personally involved in day to day actions in order to
23 demonstrate commitment and modify behaviours. Likewise Flin (2003) argues that
24 good safety management goes beyond knowing the ‘safety script’ and Hopkins
25 (2005) cautions that too often, leaders think that they can achieve safe operation by

1 publicly stating that safety comes first, but then leaving it to others. This, he argues,
2 inadvertently conveys a message about priorities and he then summarises several
3 surveys which found that whilst senior managers considered they put safety first,
4 front line workers did not agree. Given these observations, we propose further
5 investigations into the communication of the basic business assumption of water
6 suppliers, both within the organisations and to external stakeholders. Cost-benefit
7 arguments and being able to demonstrate that best-practice is being undertaken
8 may be helpful in getting the 'go-ahead' for a project but may inadvertently, promote
9 a 'badge on the wall' mentality and foster complacency. Hrudehy & Hrudehy (2004)
10 observed,"*So many outbreaks appear to have been caused by neglect or*
11 *complacency that is incompatible with recognizing safe, clean drinking water as a top*
12 *priority in life. No amount of economic rationalisation can make sense of providing*
13 *mediocre service to the public for something so vitally important".*

14

15 **WILL DEEPER COMMITMENT INFLUENCE UPTAKE OF WSPS?**

16

17 We observe that commitment to public health appears infrequently within corporate
18 aims and objectives. During this review, 91 English language water supplier
19 websites from across the world were reviewed. Of these, 61 presented some form of
20 corporate statement (aims, objectives, visions and mission). Of these 61, 42 (69%)
21 included references to financial goals, 36 (59%) to environmental goals and 25
22 (41%) included reference to public health or safety of the water supplied. How
23 should these priorities be managed in concert to ensure water safety and good risk
24 governance? Roberts & Bea (2001) show that HROs balance long term safety with
25 short term financial goals and observe that "*when organisations focus on today's*

1 *profits without consideration of tomorrow's problems, the likelihood of accidents*
2 *increases*". Serious water quality incidents continue to occur. What is needed, we
3 believe, is a restatement (with evidence) of the commitment to protect public health
4 driven by the broader requirements of organisational reliability, rather than financial
5 efficiency – a refreshed set of basic business assumptions for the water sector.
6
7 Schneider & Shrivastava (1988) maintain the strategic behaviour of organisations
8 can be understood by exploring these basic business assumptions - the content and
9 structure of which determines organisational culture. Using Edgar Schein's definition
10 of basic assumptions , perceptions, thoughts, feelings and actions can be articulated
11 in stories, symbols and behaviours that "*reinforce, institutionalise, and promote*
12 *organisation-wide sharing*" (Schneider & Shrivastava, 1988). The authors describe
13 three levels at which these psychodynamics operate: individual, group and
14 organisational, with the individual and group level contributing to the organisational
15 level, and *vice versa*. Individual psychodynamics contribute to organisational
16 mission, particularly of those at the top such as chief executive officers. Wider
17 organisational buy-in for projects or new ways of working may be helped or hindered
18 by the views of these key individuals. Group dynamics also facilitate or hinder
19 performance, particularly within strategic decision-making groups. As Schneider &
20 Shrivastava (1998) note, there are often sub-cultures within organisations with
21 different basic assumptions. Within the context of WSP implementation, where
22 stakeholder involvement (both internal and external) is so often quoted as important,
23 this may be highly influential; for example where the organisation is responsible for
24 water supply (public health protection) and wastewater treatment (environmental
25 considerations) and, where privatisation of the water supply has occurred, financial

1 considerations will be prevalent. There are different aspects to these basic
2 assumptions that must also be considered; namely, the number, pervasiveness,
3 intensity and explicitness (Schneider & Shrivastava, 1988). Broadly shared basic
4 assumptions (e.g. guardian of public health) between departments and levels may
5 promote greater commitment (e.g. to WSPs). The intensity with which this is held
6 may result in uncommitted compliance (e.g. 'lip-service') or incorporation (the belief
7 that WSPs are truly implemented with the aim of protecting public health). The
8 ongoing questioning and testing of these basic assumptions may help ensure
9 performance and decision making, and in this case ensure employees are aware of
10 *why* public health protection is important.

11

12 DiMaggio & Powell (1983) identified three typologies for organisations adopting new
13 practices:

- 14 1. Coercive, where the practice is imposed by a more powerful authority.
- 15 2. Mimetic, where an organisation adopts the practices of more successful
16 organisations; and
- 17 3. Normative, when the organisation adopts practices that it considers
18 appropriate.

19 One might argue that where the process is normative, internalisation of the practice
20 will be greater.

21

22 We argue, with others (Hrudey & Walker, 2005), for a restatement to staff, customers
23 and stakeholders, of the organisational commitment to safe drinking water and the
24 adoption of preventative risk management. It is easy to assume that the basic
25 assumptions of public health protection are universally shared within a water

1 supplier, but we observe this is not always the case. Staff turnover, retirements,
2 downsizing, outsourcing and generational influences all affect how pervasive the
3 public health imperative is within water suppliers. Particularly when the regulatory
4 push to implement is strong, as it currently is, organisations rooted in compliance
5 may not always see the strategic value of new practices (Kostova & Roth, 2002)

6

7 **CONCLUSIONS**

8

9 Water safety plans represent a generational opportunity to promote preventative risk
10 management within water suppliers. However, to ensure success, the whole
11 organisation - especially senior management - need to be advocates for protecting
12 public health. Guidance on securing buy-in is limited and too often focuses simply
13 on endorsing a policy, or using financial efficiency arguments to generate executive
14 support.

15

16 In advancing these ideas, we do not wish to appear naive. We recognise the
17 difference of emphasis between public health professionals and water utility
18 managers on the role of WSPs and risk based approaches. In practice, water utility
19 managers have a broader view of the objectives of their organisations and the
20 benefits that a risk-based approach could bring. The Bonn Charter recognises these
21 broader objectives such as customer trust and water acceptability, as well as health.
22 Additionally, most utilities, certainly in developed countries, place a huge emphasis
23 on customer service. Their customers regard the safety and reliability of water as
24 paramount, but this is often articulated in a personalised way rather than as a
25 societal commitment to the public health agenda. Possibly, this is because the

1 importance of water and sanitation as a public health measure is taken for granted
2 and has thus been inadvertently demoted as a primary motivator of behaviour.

3

4 Water managers have to manage a wide range of varying priorities including the
5 latest external political, media or regulator external pressures to manage (leakage,
6 drought, bills, flooding, social tariffs). We recognise this does not mean that they
7 regard health and water safety as less important; rather that it risks becoming taken
8 for granted under normal operating business conditions. We argue here that the
9 public health motivator should be more clearly brought out in the WSP process as a
10 paramount objective and not lost among the other legitimate drivers. Further, this
11 should apply to all stakeholders and not just utilities. We offer the following initial
12 suggestions to water utility leaders:

- 13 • Recognise that the benefits of resourcing risk management are likely to
14 include fewer incidents.
- 15 • Do not neglect long term safety improvements over short term financial gains.
- 16 • Value sound risk governance as a strategic business asset in its own right.
- 17 • Consider the benefits of improved regulatory (and stakeholder) confidence
18 that flow from good risk management.
- 19 • Greater knowledge is likely to deliver improved implementation.
- 20 • Challenging the beliefs and attitudes of staff with regards to WSPs will support
21 internalisation as well as implementation.

22 Ongoing IWA-funded research is providing resources for water utilities seeking to
23 implement preventative risk management practices. Continued research in the area
24 of buy-in and commitment by the authors will feed into this, providing additional
25 insights and practical assistance.

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