INTEGRATING ENVIRONMENTAL MANAGEMENT SYSTEMS INTO CORPORATE MANAGEMENT: A CASE STUDY OF HULETT ALUMINIUM

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Abstract

Environmental management systems (EMSs) have been advanced as a tool for successful adoption and implementation of environmental management initiatives in organisations. As with any management system, an EMS needs to be integrated into corporate management so that it may operate in congruence with the other management systems present in an organisation. One framework that has been widely recognised for fostering the process of management systems integration in organisations is Mckinsey's *7-S model* of business elements. This model has been used to understand and foster integration in mainstream management and business circles. However, it was the researcher's considered view that the model could be usefully applied in organisations to foster EMS integration. Hence, the study set out to explore the efficacy of Mckinsey's *7-S model* using a case study, namely Hulett Aluminium.

Data collection included reviewing related literature, interviewer administered questionnaires and open-ended interviews. The study had a total of 41 respondents, most of whom were questionnaire respondents. Simple coding sheets and content analysis were used to analyse the data.

It is clear from the study that Mckinsey's *7-S model* is useful to understanding EMS integration in organisations. However, the model does not adequately provide for human aspects in the process of dealing with change. The model's inclusion of human aspects seems to be confined to skills (i.e. capacity and knowledge), with an inclination towards technical imperatives. However, non-technical factors such as the way the employees perceive of the change and how it affects them are also important. Positive perceptions, especially those arising from personal results could serve to reinforce the change process, which apparently is at the heart of EMS adoption and implementation.

This study does not present statistically definitive conclusions, but interesting trends and views emerge. It should be regarded as exploratory, providing directions to researchers for further, more in-depth research into the theme of the study. The study also makes recommendations as well as suggestions for further research.

PREFACE

The work described herein was undertaken in the Centre for Environment and Development, University of Natal, Pietermaritzburg, under the Supervision of Professor. C. M. Breen of the Institute of Natural Resources, Pietermaritzburg.

I hereby declare that this is an authentic record of work and has not in its entirety nor in part, previously formed the basis for the award of any degree of this or any other University. Wherever use is made of others' work, it is duly acknowledged in the text.

07/08/2001

Signed Date

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NB: All plates with the courtesy of Hulett Aluminium

GLOSSARY

Environment
Surroundings in which the organization operates, including air, water, land, natural resources, flora, fauna, humans and their inter-relation.

Environmental aspect
Element of an orgnisation's activities products or services that can interact with the environment.

Environmental impact
Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities.

Environmental management system
That part of management system which includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing and maintaining the environmental policy.

Environmental objective
Overall environmental goal arising from the environmental policy that an organization sets its self to achieve which is quantifiable where practicable.

Environmental policy
Statement by the organization of its intentions and principles in relation to the organisation's control of environmental aspects, based on its environmental policy, objectives and targets.

Environmental target
Detailed performance requirement, quantified where practicable to the organization or parts thereof that arises from the environmental objectives and that needs to be set and met in order to meet those objectives.

Organisation
Company, corporation, authority or institution or part or combination thereof, whether incorporated, public or private, that has its own functions and administration.

Source: ISO 14000 TC

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Chapter 1

BACKGROUND TO THE STUDY

1. 1 Introduction

This dissertation is about the adoption and implementation of an environmental management system (EMS) and the accompanying complexities pertaining to change and integration. The study's contribution is in the realm of how to improve adoption of an EMS, i.e. how to facilitate change with the view to enhancing environmental sustainability in organisations. As a basic point of departure, this chapter gives a background to the study and to its focus on change, integration and environmental management systems (EMSs). The chapter is divided into five sections as follows: basis of the study, research problem, aim and objectives, study proposition and the structure of the thesis.

1.2 Basis of the Study

As changes are taking place in social, political, economic and other spheres of life around the world, many organisations are also experiencing a transformation or change (Felkins, Chakaris and Chakaris, 1993). Being key players in societal processes, organisations are compelled to develop appropriate management systems. This is necessary in order for organisations to contribute to the upholding of societal norms as well as ensuring their own survival.

Environmental sustainability has become another demand that society has increasingly placed on organisations in recent times (WCED, 1987; Reed, 1992; and Spedding, 1993). In response, many organisations have turned to environmental management systems (EMSs) as tools for promoting better management of their activities to reduce negative impacts on the environment (Netherwood, 1996). As society exerts pressure on organisations, in this case environmental sustainability pressures, organisations undergo a process of change, which if not properly handled could seriously disrupt organisational operations (Welford, 1995). Hence, it can be argued that implicit to the process of adopting and sustaining a management system (including an EMS) is the concept of change.

Since organisational activities entail different players and units, it becomes necessary that whatever management system is introduced, it should be integrated into the overall management of the organisation. The concept of integration is concerned with coordination and promotion of synergy in the quest for improved organisational performance (Luthans and Davis, 1992). As such, change and integration are like 'two sides of one coin'.

Even in the case of adopting an EMS, it is compelling that the issues surrounding change and integration are adequately brought to the fore. The success of an EMS, like other management systems depends on the support provided by other units within an organisation, hence the call for integration. Moreover, organisations do not set goals and strategies in isolation, but through a process of careful planning and integration of the organisation into the larger environment and interactions among their subdivisions (Luthans *et al.* 1988). To this end, the central focus of this study is integration, which in the context of this study is seen to denote the coordination of activities to maximise commitment and organisational effectiveness in pursuit of environmental sustainability.

1.3 Research Problem

Central to the process of adopting any management system in an organisation is the concept of change. This is also true for an EMS in that its introduction into organisational decision-making potentially impacts all the elements of an organisation. However, the challenges posed by an EMS, unlike other management systems are that its focal concern, namely environmental management, sometimes does not (or does not appear to) make direct contributions to business goals. As such, some people within an organisation could sideline environmental management efforts, for example in terms of resource allocation, time, responsibility and role allocation (Roome, 1992). This means that there is an opportunity for reduced commitment to environmental management, a situation that might be partly manifested by lack of coordination of functional roles. This poses a threat to the success of an EMS because proper management action (as presupposed in an EMS) requires optimal coordination and integration of activities and processes. As Netherwood (1996: 23) has argued, "only strategies based on an integrated total EMS and environmental thinking and ethics into company practices, offer any real prospect of achieving pathways to environmentally sustainable action."

In brief, the research problem may be summarised as follows:

> *EMSs are easily adopted but seldom efficiently implemented because emphasis tends to be on technical considerations of organisational components and not sufficiently on the integration of the EMS processes into overall organisational management. Under such scenarios, less emphasis is placed on the growth processes (of people within the organisation and the organisation itself) that should accompany the EMS.*

1.4 Aim and Objectives

This study was aimed at exploring and understanding the complexities of implementing an EMS in the light of the processes of change and integration. To achieve this aim, the study set out to use a case study, namely Hulett Aluminium with the following specific objectives:

- To understand Hulett Aluminium's environmental management system;
- To assess the perceptions of the employees of Hulett Aluminium on their company's EMS;
- To evaluate the efficacy and value of Mckinsey's *7-S model* to understanding of EMS integration in an organisation;
- To draw lessons and recommendations based on the study.

1.5 Study Proposition

The following proposition was set for this study:

- Mckinsey's *7-S model* of business elements can be usefully applied to evaluate the integration of an EMS into corporate management. It, however, needs to be adapted to include:
    - top management's commitment to ensuring necessary policy, structural and process changes to corporate functions, the involvement of employees in decision-making and planning at critical stages in the implementation process.

- the recognition that successful implementation of an EMS is affected by the availability of financial and other resources (as well as attitudes to allocation thereof).

1.6 Structure of Thesis

Chapter one has provided some background to the study. Chapter two covers concerns in environmental management, most specifically in relation to factors outside the firm. This has been done through a review of relevant literature in order to establish the context within which the study's analytical framework was developed. Chapter three presents the analytical framework for the study. Issues of methodology are presented in chapter four and the findings of the study are set out in chapter five. Chapter six discusses the findings by applying Mckinsey's *7-S model* as well as providing a critique to the model. It also tests the study proposition together with its stated preconditions while chapter seven concludes the study with lessons, recommendations and suggestions for further research.

Chapter 2

TRENDS IN ENVIRONMENTAL MANAGEMENT

2.1 Introduction

This chapter presents a review of relevant literature in order to establish the context within which the study's analytical framework (chapter 3) was developed. To accomplish this task, the chapter is broadly divided into two sections. The first is the contextual background, and provides the backdrop to the emergence of environmental awareness and how humanity has responded to these trends, both internationally and locally, i.e. in South Africa. It highlights the growth of pressures for environmental sustainability, the concept of sustainable development, the Earth Summit and the global response of industry to international environmental concerns. The discussion on South Africa will draw attention to the response of government and industry to environmental pressures. The second section extends the review, but will focus on environmental management in industry. It focuses on EMSs as one of the tools being promoted to ensure environmental protection in organisations. Overall, the literature review helped to identify key concepts and guide the research process.

2.2 Contextual Background

For a long time the natural environment has been under severe threat from over-use and abuse of resources by society. This has led to depletion of natural resources and degradation of the natural environment. Over the years, some forces have challenged and partially helped to put in place supportive perceptions and actions aimed at ameliorating these unnecessarily high environmental costs (Reed, 1992). Despite being a long-standing subject, environmental issues have only been a matter of public concern for over quarter a century (Welford, 1995). Consequently, environmental management represents a relatively new regulatory challenge for governments. In recent times however, concern for the environment as it relates to organisations is seen both as a performance challenge for business as well as a business opportunity of immense proportions (Hart, 1999). Organisations have now increasingly realised that environmental competence can provide competitive leverage while

simultaneously enhancing the fulfillment of societal goals for a cleaner and safer environment (Gilbert, 1993).

The above developments should be understood within the context that the classical motive of business is to make use of resources and engage in activities designed to increase profits (Welford and Gouldson, 1993). The underlying assumption is that the predominant motive of business is to make profits while at the same time reducing direct operational costs. This, among other things, means that industry tends to be more responsible to shareholders than other stakeholders. However, this relationship has been affected by the environmental challenge. Nowadays, it is generally acknowledged that organisations are no longer only responsible to the shareholders, but also to customers, employees, union leaders suppliers, other special interest groups and society in general (Welford, 1995 and Peattie, 1995). In addition, organisations are now held accountable for their actions that might impact on the environment and are expected to observe the precautionary principle[1] as part of their overall business strategies.

2.2.1 Growing Pressures

The environmental crisis grew to unprecedented levels in the 1970s with a sharp increase in environmental awareness and considerable strides recorded in the form of new legislation for environmental protection (Fischer and Schott, 1993). It has also been note that in all Western countries, new government agencies were installed to spearhead environmental protection efforts (Fischer and Schott, 1993). For example, for the first time, a National Policy Act was passed in the United States of America, bringing to the fore the concept of 'eco-development' to describe the process of ecologically sound development with positive management of the environment for human benefit (Sexton *et al.* 1999). The main objective of environmental management was seen as the development of comprehensive planning and protection, and enhancement of the environment for future generations (Peatie, 1995).

[1] The precautionary principle means using caution before something is done or happens, especially if there is uncertainty. It recommends that activities should not be approved if they have impacts that are uncertain as well as potentially risky and irreversible. In the event of the proposed activity and its alternatives are equally risky, it is recommended to make the best judgement possible about the lesser of the two evils in the interest of environmental sustainability (DEAT, 1998a: 19).

As pressure for environmental management grew, the United Nations Conference on the Human Environment and the Club of Rome's *Limits to Growth* report demonstrated international official confirmation of the importance of the environment in 1972 (Fisher and Schott, 1993). At the United Nation's Stockholm conference, the dominant view was a Northern concern addressing the problems of human well being in the face of industrial development (Sexton, *et al.* 1999). More specifically, it was a concern about the deleterious impacts of industrialisation on the environment. It focused on pollution and population growth. The agenda for the South on the other hand, was more concerned about poverty and the resultant degradation of natural resources. This presented a clear stand-off between the North and the South which potentially threatened the much-needed global solidarity in the face of growing environmental problems (Reed, 1992).

With time, the pressure for change gained momentum due to several factors. Commenting on the subject, Welford (1996: 4) observes that "as scientific and technical knowledge relating to cause and effect to environmental damage has become more complete, the pressure to change ways in which industry behaves has increased." Other factors include media and pressure group attention, cultural expectations and the structure and approach of political and administrative systems (Hajer, 1996). The interplay of all these factors has facilitated increased awareness of environmental issues from a cross-section of society.

The foregoing illustrates that the pressure for change in relation to environmental protection has been both bottom-up, from people as voters and consumers, and top-down from the international community (Barton and Bruder, 1995). Also, there is some degree of agreement that many environmental problems have arisen from economic activity, and more specifically, actions and decisions of business organisations. For various reasons, including mounting global concern about environmental problems, industry has been obliged to consider these issues in the context of complex and unpredictable social, political and environmental systems (Hart, 1997).

2.2.2 The Concept of Sustainable Development

The World Conservation Union (IUCN), United Nations Environmental Programme (UNEP) and Worldwide Fund for Nature (WWF) jointly put together the World Conservation

Strategy (WCS) in 1980 as a Global Framework for Conservation (Amman *et al.* 1995). This was a result of increasing realisation at national and international levels of decision-making that a healthy society needs a healthy environment as well as a healthy economy. Central to the WCS was the emphasis on the need to promote development while achieving conservation. "The WCS offered the first exposition of 'sustainability' that effectively linked human welfare, now and for the future, to sustainable management of the planet's patrimony" (Reed, 1992: 29). In this context, sustainability is taken to mean the long-term health of global ecology (Barton and Bruder, 1995).

Against this background, in 1987, the World Commission on Environment and Development (WCED) drew attention to the need for a new development path to sustain human progress, not just in a few places and for a few years, but for the entire planet into the distant future (SARDC, 1994). This new approach was published in the now famous document in environmental circles: *Our Common Future*. The WCED (1987: 43) defines sustainable development as "development that meets the needs of present generations without compromising the needs of future generations to meet their own needs." According to Reed (1992), the clarion call for sustainable development includes responsibility for future generations; alleviation of poverty in the South; and pursuit of sustainability in the international economy (reordering the patterns of trade and capital flows). Sustainable development was also defined to denote "improving the quality of human life while living within the carrying capacity of the supporting ecosystem" (IUCN, UNEP and WWF, 1992: 10). This definition recognises nine principles for a sustainable society as shown in Box 2.1.

1. Respect and care for the community of life
2. Improve the quality of human life
3. Conserve the Earth's vitality and diversity
   - ⇒ Conserve life-support systems
   - ⇒ Ensure that uses of renewable resources are sustainable
   - ⇒ Conserve biodiversity
4. Minimize the depletion of the non-renewable resources
5. Keep within the Earth's carrying capacity
6. Change personal attitudes and practices
7. Enable communities to care for their own environments
8. Provide a national framework for integrating development and conservation
9. Create a global alliance

Source: IUCN, UNEP & WWF (1992: 10)

Box 2.1: Principles for a Sustainable Society

So conceptualised, it is vivid that sustainable development is premised on three dimensions: social, economic and environmental concerns. The economic component obligates society to follow economic growth directions that help to make a rise in real income as opposed to those that are short-term strategies that lead to long-term economic deprivation (Reed, 1992). With particular reference to industry, the principles of sustainable development underscore the need to integrate environmental criteria into economic practice to ensure that strategic plans of organisations, while satisfying the need for continuing growth and evolution, conserve nature's 'capital' for the future (Gilbert, 1993). Applying sustainable development implies living within the carrying capacity of the ecosystems and it requires alterations in many aspects of society. It also means that in industry's pursuit of economic ends, all costs should be internalised, including societal and environmental costs related to both production and disposition of goods. This, by implication, suggests a need to wholly implement the full-cost[2] principle in industry.

The social dimension involves the meeting of the basic human needs as well as equity of chance to do so. For a development course to be sustainable over a long period of time, wealth, resources, and opportunities ought to be distributed in a manner that promotes social equity. This means that people should have access to education, health and the other opportunities that enhance their production capacities (Reed, 1992).

The environmental side of sustainable development is premised on long-term status and subsequent productivity of natural resources. Reed (1992) argues that this should be expanded to incorporate the earth's life support systems. Environmental sustainability requires that environmental products and services be utilised in a way that does not threaten the ecosystem function of the earth and its inevitable contribution to the survival of mankind and other forms of life. In this regard, Barton and Bruder, (1995: 4) hold that "sustainable development is about long-term enhancement of human social and economic well-being, currently threatened by our poisoning of our own habitat."

[2] The full-cost principle is based on the understanding that usually, the full environmental costs are not taken into account when a decision is made to undertake it. These costs or externalities, are overlooked because they are borne by other members of society rather than by the initiator of the activity. The full cost principle therefore advocates the internalisation of external costs by organisations in order to better protect the environment. (DEAT, 1998a: 17).

As such, sustainable development serves to remind us that the earth belongs as much as to those who come after, as to us. The above principles and understanding of sustainable development have had a profound effect on what was to follow later. In particular, the WCED principles laid the foundations for the Earth Summit, which demonstrated that environmental management is a transnational concern comprising many facets (Spedding, 1993).

2.2.3 The Earth Summit

Besides the WCED, the Earth Summit was motivated by other occurrences around the world. These instigating factors include the "mounting political pressure from the Green Movement, the environmental catastrophes such as Bhopal gas leak in India, the near meltdown of the nuclear reactor Chernobyl, the Exxon Valdez oil spill in Alaska, the Rhine disaster, acid rain, the greenhouse effect, depletion of the ozone layer and the rain forests" (Soutter and Möhr, 1993: 1). The Earth Summit achieved facilitated the signing of several conventions: Convention on Climate, Convention of Biodiversity, the Earth Charter was agreed on, Agenda 21 (action programme to promote sustainability) was adopted, and the UN Commission on Sustainable Development (CSD) was created. The above, coupled with international law, international environmental lobby and trade barriers have greatly helped to promote environmental consciousness around the world.

The significance of the Earth Summit is that it facilitated articulation of the concept of sustainable development. This considerably helped to influence mindsets on the relationship between industry and the environment. In her prediction of the scope of the influence of the Earth Summit, Spedding (1993: 8) observed "its significance for the business community will come into sharper focus as the enormous task of transposing its many principles into international and national legislation gathers pace." Generally, there has since been a considerable improvement in efforts to implement practical measures to promote environmental management in industry (Gilbert, 1993).

2.2.4 The Response of Industry at Global Level

New ideas, especially if they are calling for change, usually meet some kind of resistance in one way or the other. The same could be said about the initial reaction of industry to environmental challenges globally. Welford (1995: 4) has noted:

> "while it is difficult for industry to refute a general need for environmental protection, their response has been piecemeal, adopting bolt-on strategies aimed at fine-tuning their environmental performance within the traditional constraints imposed by a capitalist society."

A parallel observation has been made to the effect that:

> "Business' initial response could best be described as defensive. Environmental disasters were seen as the exception rather than the rule, and public pressure was ascribed to incorrect perceptions rather than fact. Yet public pressure was a reality and continued to grow and soon governments were imposing tough legislation with severe penalties" (Soutter and Möhr, 1993: 2).

Nevertheless, it is also widely acknowledged that with the rise in pressure for environmental protection, many companies in Europe and the United States of America started tackling their own environmental performance internally (Soutter and Möhr, 1993; Sexton *et al.* 1999 and SABS, 1996). At the same time, wider initiatives were being developed in industry. A summary of some of these initiatives is provided by Soutter and Möhr (1993) as follows: the establishment of the Business Council for Sustainable Development as a global task force for world business leaders; the formulation of the Business Charter for Sustainable Development by the International Chamber of Commerce (ICC - Appendix 3); formation of the International Network for Environmental Management (INEM) to cater for small and medium-sized businesses, and the founding of the Global Environmental Monitoring Initiative (GEMI) in the United States of America.

While these initiatives were in process, industry-focused efforts also started to emerge. An illustration is the initiation of the Responsible Care Programme by the Chemical Industry Association (Simmons and Wynne, 1993). Through this programme, the Chemical Industry Association (CIA) adopted several guidelines (Appendix 4) based on the approach: *we don't expect the public to trust us. We expect them to* ***track*** *us* (Soutter and Möhr, 1993). Through this programme, the CIA made itself more accountable to the public through the principles, which have since been adopted by many companies in the chemical industry the world over.

2.2.5 The South African Context

Spedding (1993) has observed that international initiatives and developments have served as a precursor and spur for national developments. South Africa is not an exception to this observation. However, internal issues have equally played a key role. In particular, it is vital to note that environmental problems have been partly exacerbated by the country's socio-political history as may be inferred from this statement by former South African President Nelson Mandela:

> "Environmental concerns can unite South Africa, going beyond racial, political, and economic barriers. In addition to the crisis in education, housing, employment and a host of other problems, the new democracy will be left with apartheid's environmental legacy ... it is often the poor communities that are victims of the government's weak environmental policies" (IDRC, 1995).

The response to global level environmental developments in South Africa may be seen at two levels: government and industry. These two are discussed in turn.

Government's Response

South Africa has a number of policies and laws that promote and regulate the protection of the environment while, at the same time encouraging responsible social and economic development (DEAT, 1999a). These include white papers on different environmental aspects, as well as legislation to regulate environmental management. The response by the South African Government should also be seen in the context of the Constitution, which states that everyone has the right to:

i. "An environment that is not harmful to their health or well-being; and
ii. Have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:
   - ⇒ prevent pollution and ecological degradation;
   - ⇒ promote conservation; and
   - ⇒ secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development" (Constitution, 1996: 11).

This environmental right has paved the way for more action regarding legal reform for environmental purposes. In section 38, the Constitution also provides for enforcement of rights, a provision that is aimed at upholding environmental justice in the public interest. Generally, environmental law has been a contentious subject in as far as it relates to industry in South Africa. The debate is illustrated by the following critique:

> "... current South African environmental law has little influence over long-term strategic industrial decision-making. The response of many South African industries to environmental law is reactive rather than proactive. South African environmental law is not designed to encourage long-term environmental planning by industry. This is largely due to problems of enforcement and fragmentation" (Lazarus *et al.* 1997: 36).

With this kind of critique and the compelling realities at global level, it was increasingly apparent that a legal reform process was inevitable if the serious concerns on the industry-environment link were to be addressed. Some of the major laws[3] that have emerged include the Environmental Conservation Act 73 of 1989, the National Water Act 36 of 1998 and the National Environmental Management Act (NEMA) 107 of 1998. NEMA is considered to be the most important single piece of environmental legislation because it serves as an overarching framework for environmental management, and its thrust may be summarised as follows (see table 2.1 as well):

- Provides a framework for integrating good environmental management into all development activities;
- Establishes principles guiding the exercise of functions affecting the environment;
- Establishes procedures and institutions to facilitate and promote co-operative government and intergovernmental relations;
- Establishes procedures and institutions to facilitate and promote public participation in environmental governance;
- Facilitates the enforcement of environmental laws by civil society (DEAT, 1999b).

NEMA has put in place measures meant to protect the interests of the poor and vulnerable members of the community who have for a long time, faced the brunt of environmental mis-management. The provision for public participation also represents a key stride with potential benefits depending on how the process is managed. Through NEMA principles, a host of development aspects have been brought under regulations as well as the provision for public participation (Dlamini, 1997). The Act fulfils the duty that is incumbent on the state in terms of NEMA section 24 (b) to protect the environment through 'reasonable legislative measures'. In addition, the Act gives effect to the spirit of co-operative governance contained in Chapter

[3] Appendix 5 gives a summary of South Africa's legislative responses to the environmental challenge.

3 of the Constitution. This is vital considering the fact that the Constitution identifies the 'environment' as a domain of concurrent national and provincial legislative competency.

Table 2.1: A summary of NEMA provisions of relevance to industry

Chapters	Sections	Summary
Chapter 1	*Section 2* National environmental management principles	Applies to all organs of state that may significantly affect the environment Guide the interpretation, administration and implementation of all environmental laws
Chapter 5	Integrated Environmental Management	Includes the provision for impact assessment and public participation Regulations under section 24 to ultimately replace the existing EIA procedures
Chapter 7	*Section 28*	*Compliance, enforcement and protection* Deals with duty of care and remediation of damage Provides for strict liability, whosoever is responsible for an environmental problem such as pollution, or degradation is to take the necessary measures to prevent it, minimize it or rectify it and it also provides for steps to take for authorities including official directives and cost recovery.
	Section 29	Protection of workers refusing to do environmentally hazardous work
	Section 30	*Control of emergency incidents* Prescribes steps to be taken in the event of an emergency (e.g. chemical spillage) involving reporting to relevant authorities, remedial measures and action needed to be taken by authorities.
	Section 31	Provides for access to information and protection of whistle blowers
	Section 32	Augments the constitution's *locus standi* provisions
	Section 33	Provides for private prosecutions
	Section 34	Provides for additional orders in criminal proceedings and vicarious and director's liability
Chapter 8	*Section 35* Environmental Management Cooperation Agreements	Allows for co-regulatory measures

Source: DEAT (1998b)

Some remarkable developments have occurred since NEMA was promulgated, such as the case between a poor West Rand community and Iscor, a steel firm operating in the area and alleged to have polluted local water and soil resources (Brümmer, 2000). NEMA has further helped to strengthen the environmental right that is provided for in the Constitution. It has helped to address legal technicalities, which were in the past generally perceived as barriers to the pursuance of environmental law in South Africa. These include the expansion of *locus standi,* which has widened the possible potential number of plaintiffs in environmental cases.

The response by government is also seen in terms of the efforts to promote the principles of Local Agenda (LA) 21 as a planning and development approach (CENGOPO, 2000). This is being done at three levels, namely national, provincial and local. At national level, the Department of Environmental Affairs and Tourism (DEAT) is responsible for implementing LA 21 while initiatives are currently under way in most of the provinces. Some cities already have LA 21 committees in place and examples include Durban, Pietermaritzburg, Cape Town and Johannesburg (CENGOPO, 2000).

Response of Industry

Some of the environmental calamities resulting from industry in South Africa include the Sappi spill at Ngodwana and Thor Chemicals mercury poisoning (CENGOPO, 2000). However, in South Africa, as in other countries, companies' initial response to growing levels of environmental awareness and pressure has been described as defensive (Soutter and Möhr, 1993). Some companies have since embraced the advantages of proactive measures to environmental management and associated spin-offs. This has led to practical measures at company levels being implemented. Soutter and Möhr (1993) compiled a profile of such companies as early as 1993, and there is little doubt many more companies have since joined these efforts.

Environmental protection initiatives have not just been restricted to individual companies. As far back as 1993 Soutter and Möhr (1993) identified the following as having undertaken industry-wide efforts to enhance environmental protection: the South African Sugar Association, the Agricultural and Veterinary Chemicals Association, the Packaging Council of South Africa and Aerosol Manufacturers. All these industries developed environmental initiatives that are being observed by their respective members. The Chemical Manufacturers' Association initiated the Chemical Industry Forum, which in turn endorsed and accepted the internationally acclaimed Responsible Care Programme in response to the public's concerns about the manufacture, transport, use and disposal of chemicals (DEAT, 1999b). Similarly, the South African Chamber of Business has formed an environmental Affairs Committee while the Industrial Environmental Forum of Southern Africa is also in place (CENGOPO, 2000).

Another related initiative is the formation of the Industry and Business Environmental Education (IBEE) Forum. This idea was originally from Gauteng Province, but has spread around the country (CENGOPO, 2000). In KwaZulu-Natal Province for example, the Pietermaritzburg Chamber of Commerce and Industry (PCCI), through its Environmental Committee, helped to initiate the IBEE Forum for its members in the Pietermaritzburg-Msunduzi area (CENGOPO, 2000).

From the foregoing, it is apparent that both government and industry are responding to the emerging challenges to protect the environment. The South African member of the International Organisation for Standardisation (ISO), namely South African Bureau of Standards (SABS), is also cognizant of the benefits likely to accrue from employing EMSs in industry. To this end, SABS has endorsed the ISO 14001 standards and has gone ahead to publish them for national use (SABS, 1996).

2.3 Towards Environmental Management in Industry

Consequent to the above developments, industry has found itself facing the growing challenge for environmental management. According to the United Nations Environmental Programme (UNEP):

> "Environmental management is a systematic approach to environmental care in all aspects of business. It involves the assessment of both the benefits of adopting environmental management in financial terms, and the environmental costs of not adequately observing the precautionary principle" (UNEP, 1995: 10).

Since the Earth Summit and its accompanying conventions, there has been added concern on the need for environmental management as a tool for protecting the environment, both from unsustainable use of natural resources and the effect of industry on the environment (Spedding, 1993; and Welford and Gouldson, 1993). Industry responded by engaging in new social, political and economic processes and by developing internal responses to the demands of environmental management. In general, there are several conceptions of how to manage environmental issues in business. These have been translated into programmes and codes of practice including total quality environmental management (GEMI, 1991), eco-efficiency (Schmidheiny 1992), industrial ecology (Frosch 1992 [cited in Roome, 1999]; Allenby and Richards 1994), and environmental management systems (ISO, 1996). Table 2.2 critiques

and illustrates these programmes (codes, principles and specific practices), which have emerged in industry in pursuit of environmental protection.

Table 2.2: Anatomy of structural change potential of various environmental codes of practice

Code of Practice	Soul (Beliefs)	Heart (Values)	Head (Authority)	Hands (Tools)
Total Quality Environmental Management	▲	▲	–	**
Eco-efficiency	**	*	–	*
Product stewardship	*	*	–	*
Responsible care	**	**	**	***
International Chamber of Commerce Business Charter	**	***	*	*
International Standardization Organization (ISO 14000)	–	–	**	**
Coalition of Environmentally Responsible Economies	***	***	**	**
Industrial Ecology	***	*	–	***
The Natural Step	***	***	–	**
Design for Environment	***	*	–	***

Legend

▲ Reinforcing business-as-usual; – Absent; * Implicit; ** Explicit-weak; *** Explicit strong

Source: Ehrenfeld, 1999.

Many companies are now implementing the above and other voluntary programmes. They are voluntary because their adoption is discretionary. One advantage that has been associated with initiating environmental management initiatives is competitive leverage on the market. This is because such companies are able to distinguish their products as, for example, being recyclable, ozone friendly, and biodegradable or generally as being environmentally friendly (Soutter and Möhr, 1993). An EMS is one tool that organisations use to demonstrate environmental responsibility. In the words of Sasseville *et al.* (1996: 24):

> "As the global market place imposes increasing demands on companies to minimize the environmental impact of their products (and activities), it is becoming of utmost important that organizations integrate a sound environmental management system (EMS) into their overall business structure."

Through the use of an EMS, an organisation seeks to develop its internal capacity to enhance the implementation of environmental management. According to Roome (1992), an EMS helps an organisation to continuously meet the need of planned and programmed change to support environmental management. However, any efforts to discuss EMSs without making reference to environmental management standards render the discussion incomplete. Hence, a brief discussion of environmental management standards takes precedence as the necessary background.

2.3.1 Environmental Management Standards

Environmental management standards such as the British Standard for Environmental Management Systems - BS7750 (BSI, 1994), the European Union (EU) Eco-management and Audit Scheme (EMAS, 1993) and the International Organisation for Standardization (ISO 14000 series) have been developed to provide organizations with a framework to implement an EMS within their organization (Sasseville *et al.* 1996). A common characteristic about these standards is that they are founded on the principles of total quality management [TQM] (Netherwood, 1996). A general critique of these standards, according to Netherwood (1996), is that they do not go far enough in environmental terms; they are defensive, bureaucratic, and do not provide an adequate framework to tackle urgent environmental issues and work towards sustainable management practices.

Notwithstanding the critique, the importance of environmental management standards is still widely acknowledged. This is in light of growing environmental pressures and concerns surrounding corporate behaviour in regard to the environment. It has, consequently, become imperative for organisations to strive to stay ahead of the public, legislation and all the other forms and sources of pressure for environmental protection (Kinsella, 1994). For example, trade barriers are being effected to promote positive behaviour and attitudes towards the environment by industry. Some markets such as the European Union have set very high environmental standards for companies wishing to penetrate them (Spedding, 1993). The need for companies to adopt environmental management standards is partly conveyed in the following argument:

> "Just about any company faces a growing number of environmentally related regulations. With world trade increasing, the environmental concerns of other countries are being passed from international corporations down through their supplier network. More and more companies are required to provide environmental impact information for their products. Faced with this deluge of requirements, the typical company needs to organise its resources effectively to face this challenge" (Clements,1996: 1).

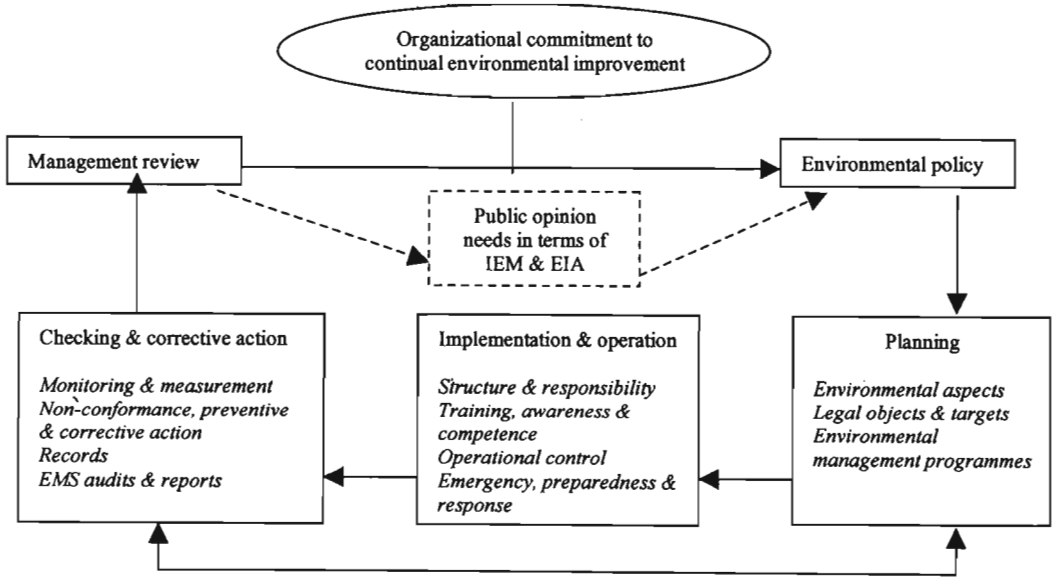
2.3.2 Defining an Environmental Management System

The British Standards Institute (BSI, 1994: 6) defines an EMS as "the organisational structure, planning activities, responsibilities, practices, procedures processes and resources for developing implementing, achieving, reviewing and maintaining environmental policy." It is a system for addressing environmental policies, objectives, procedures, principles,

authority, responsibility, accountability and implementation of an organisation's means for managing its environmental affairs (Sasseville *et al.* 1996). These definitions suggest that an EMS brings together different organisational elements, placing them in a framework that permits organisations to co-ordinate these components thereby providing an opportunity to understand and control the various elements of environmental management.

Although many EMSs have been developed over time, they share a lot in terms of providing guidance for both the philosophy and practices to ensure that they are developed and used efficiently to promote environmental protection (Netherwood, 1996). Also, there are great similarities regarding processes, elements and expectations. There are five elements to an EMS as shown in figure 2.1: an environmental policy, a plan, implementation, checking and corrective action, and management review. Each of these elements addresses key areas of EMS and facilitates a systemic process that is cardinal to the success of any EMS. The purposes of each of the EMS components is summarized in table 2.3.

Figure 2.1: Elements of an Environmental Management System



Adapted from the Gilbert (1993); UNCTAD (1996) and SABS, 1996.

Added by author signifying the weak links for facilitating public disclosure and communication with external parties which have generally been identified by various people to be missing in EMSs including the ISO 14001 processes

The main links given by ISO, signifying processes

Table 2.3: A summary of the purposes of the elements of an Environmental Management System

Element	General Purpose
Environmental policy	Sets principles and gives direction for the organisation. An environmental policy is also a demonstration of top management's commitment to environmental protection and is translated into action by pursuing objectives, targets and environmental programmes set within the context of the policy.
Planning	Facilitates the analysis of an organisation's environmental aspects (including its processes, products, services as well as the goods and services used by the organization.
Implementation & operation	Implementation and organisation of processes to improve operational activities that are essential from an environmental perspective (including both products and services of an organisation).
Checking & corrective action	This includes monitoring, measurement, and recording of the characteristics that can have a significant impact on the environment. Auditing is a key requirement in this regard
Management review	Review of an EMS by an organization's top management to ensure its continuing suitability, adequacy and effectiveness.
Continual improvement	Completes the cyclical process of an EMS; i.e. plan implement, check, and review and continually improve.

Adapted from ISO TC 207 Frequently Asked Questions - http://www.tc207.org/faqs/faqs_main.html

Rationale for Environmental Management Systems

Previously, legislation was seen as the panacea to industry-related environmental problems. The concern, however, has been that while environmental regulations have been developed for emissions to the air, water and land, they are external to organisations and keep changing, making it difficult for companies to remain current (Kinsella, 1994). By focusing only on environmental impacts (as implied in regulatory measures), the full range of effects a company may have on the environment becomes hidden (Sasseville *et al.* 1996). In other words, compliance with regulations is largely a reactive approach to managing a company's impacts on the environment. A complimentary method for achieving environmental protection is to use internal standards (Kinsella, 1994). It was out of this understanding that the EMS concept was conceived. An EMS provides the opportunity to integrate environmental criteria into an organisation's performance considerations at all levels (Gilbert, 1993).

Furthermore, EMSs should be comprehensive. According to Morisson *et al.* (2000), they encompass the entire production process and strive for 'continual improvement' - rather than focusing on fixed discharge limits and 'end of pipe' pollution abatement and controls, as is the case with regulation. Sayer (1996: 8) summarises the thrust of an EMS as follows: "set-up and run a management system that will maintain the existing environment as is or make it

better, and accept accountability as a way of life." The above justifications coupled with the benefits accruing from employing an EMS (Box 2.2), have helped to make EMSs more popular in organisations.

Benefits of an Environmental Management System

Much of the strength of an EMS is in its ability to gather vital information. If effectively implemented, an EMS could serve as a regular and dependable method of collecting environmental performance data for different stakeholders. The iterative process of defining, documenting and continually improving day-to-day management practices gives EMS another edge (Morrison *et al.* 2000). Potential benefits of implementing an EMS are summarised in Box 2.2.

Box 2.2: Potential benefits of implementing an Environmental Management System

- Maintaining good public/ community relations
- Satisfying investor criteria and improving access to capital
- Obtaining insurance at reasonable costs
- Enhancing image and market share
- Meeting vendor certification criteria
- Improving industry-government relations
- Improving cost control
- Assuring customers of commitment to demonstrable environmental management system
- Reducing incidents that result in liability
- Demonstrating reasonable care
- Conserving input materials and energy
- Fostering development and sharing environmental solutions

ISO TC 207 Frequently Asked Questions - http://www.tc207.org/faqs/faqs_main.html

In general terms, EMSs have provided yet another perspective from which to improve effectiveness of organisations. This is especially the case if EMSs are seen within the context of organisational development which, according to Armstrong (1984), denotes planning and implementation of programmes designed to improve the effectiveness with which an organisation functions and responds to change. This suggests that EMSs have something to offer because they recognise that change and other organisational processes should not be allowed to drift. Rather, they ought to be managed, an aspect that stands out very prominently in EMSs.

There are also spin-off benefits that could accrue to regulators from the implementation of EMSs in industry. It could lead to more efficient use of public resources, as it allows

regulators (as well as public interest organisations) to focus resources on industry laggards (Morrison *et al.* 2000). With EMS being almost a market prerequisite, this creates possibilities for such organisations to enter competitive markets as opposed to such markets being a near-preserve for big corporations. Environmental management has also been hailed for enhancing partnerships at different levels, for example the CIA's Responsible Care Programme (Simmons and Wynne, 1993). This type of partnerships was never witnessed in erstwhile times in the environmental arena, especially as it relates to industry (Morrison *et al.* 2000).

Proliferation of EMSs - Which way forward?

Recognising the overwhelming potential benefits of developing and implementing an EMS, different versions of EMS started to emerge within a short period. Prominent among these is BS7750, an EMS developed by the British Standards Institute in 1992 for organisations in Britain. Another environmental standard is the Eco-Management and Audit Scheme (EMAS) of the European Union. However, there were concerns about the proliferation of EMSs (as part of the several industry responses to the strong general interest in sustainable industrial development precipitated by the Earth Summit). Hence, there was a rise in calls to check their proliferation and for the need to standardise them (Morrison *et al.* 2000).

Consequently, the International Organisation for Standardisation (ISO) found itself playing an added role in the form of environmental management. Within the ISO 14000 series, ISO 14001 *EMS -- specification with guidance for use* is the standard that spells out the requirements of an EMS. The standard covers how a firm might manage and control its organisational system so that it measures, controls and continually improves the environmental aspects of its operations. ISO 14001 has since become the dominant EMS standard worldwide (Sasseville *et al.* 1996). The dominance of ISO 14001 is also demonstrated in a study report that while 20% of the respondents base their EMS solely on ISO 14001, about 60% base their EMS at least in part on ISO 14001 (Wells, 2001).

Concerns about Environmental Management Systems

All management systems are subject to debate, and inevitably attract critique. This is also true for EMSs. The following discussion focuses on the ISO 14001 EMS. This is because of the status that ISO 14001 has gained over other EMSs in recent years as explained above.

Besides the organisational factors that can limit the effectiveness of an EMS, there are hurdles with EMS processes and EMS standards (UNCTAD, 1996). For instance, with regard to ISO 14001, the scope and magnitude of the critique is partially conveyed in this statement: "while potential environmental benefits of the ISO 14000 are substantial, there are many unanswered questions about how they will be applied in practice and their ultimate effect on environmental quality" (Morrison *et al.* 2000: 2).

It has been contended that because of the inclination toward certification, ISO 14001 presents disadvantages for the Small, Medium, and Micro-sized Enterprises (SMMEs) and companies in the developing countries in terms of accessing the market. This concern is given currency by the observation that while not mandated by international law, EMSs may become a *de facto* prerequisite in international trade, as has happened with ISO 9000 (UNCTAD, 1996; and Morrison *et al.* 2000). In essence, this scenario gives an added leverage to companies that already have competitive advantage on the market because they are likely to be certified. Put differently, small firms in developed and less developed countries may face disproportionate costs, technical hurdles, and infrastructure difficulties, precluding implementation and third-party certification to ISO 14001.

There are also fears that certification may be misconstrued as 'an end in itself' rather than 'a means to an end'. This may be attributed to the fact that certification may be reduced to 'a rubber stump' for participating on the international market. Consequently, companies risk being pre-occupied with certification rather than their own environmental performance. This threatens to wear away the utility of EMS as a tool for enhanced environmental performance. In addition, considering possibilities for all forms of pressure, including funding, human resources and technical constraints on National Standards Organisations, this becomes worrisome. This is more so in the less developed countries where the need for foreign exchange is more critical, thereby increasing chances of National Standards Organisations compromising their requirements in order to allow their local companies to enter the international market. Morrison *et al.* (2000) elaborate this by arguing that National Standards Organisations are likely to be compelled to try hard to reduce obstacles to certification. In the process, the set requirements for promoting environmental performance are likely to be negated.

EMSs have been noted for their inability to meet public policy objectives and address societal expectations for corporate accountability. As Shayler *et al.* (1994: 28) with reference to BS7750 stated: "the only requirement seems to be to demonstrate a capability for marginal environmental improvements within a self-determined framework of policies, systems and assessment technologies." The concern is that while an EMS may be developed and effected in an organisation, the very fact that it is not performance-based means that nothing will be brought to the fore regarding an organisation's environmental performance. This is clearly conveyed in the following statement:

> " ... it is theoretically possible for an EMS to be developed by an organisation and the standards satisfied, when the organisation has an appalling record in environmental terms, by achieving minimum levels of compliance and demonstrating a commitment to continuous improvement, however small that may be" (UNCTAD, 1996: 114).

Another shortcoming is that ISO 14001 alone cannot meet public policy objectives (Morrison *et al.* (2000). This argument is premised on the fact that certification to ISO 14001 does not necessarily mean that minimum environmental requirements are being met. This is the reason why some countries, especially in the European Union and the United States of America, have developed additional requirements built around performance requirements (Sasseville, *et al.* 1996). In support of this position, it has been argued that:

> "Components added to the basic 14001 EMS to address its policy shortcomings include environmental performance reporting, compliance assurance programmes, an emphasis on pollution, and stakeholder involvement in the design and implementation of EMSs. These additional components are not likely to be mandated by law, but instead will apply only to companies that voluntarily elect to participate in performance-based regulatory initiatives" (Morrison *et al.* 2000: 5)

Another important factor that threatens to undermine the credibility and value of ISO 14001 is the absence of a meaningful public reporting requirement (Gilbert, 1993 and Morrison, 2000). Under the present scenario, an organisation can implement an EMS but it is not obliged to report on its performance to the public. This situation is seen by many as a negation of one of the key features of global environmental consciousness, namely openness as the best policy for environmental protection. Consequently, transparency under the present ISO 14001 is inevitably questioned on account of the fact that international and emerging norms have put an added demand on corporate responsibility by availing an opportunity for scrutiny and appraisal of companies' environmental management practices and performance

by outside parties. One way of facilitating this process is reporting on environmental performance, and making such reports available to the public.

This lack of a satisfactory public disclosure and reporting requirement under ISO 14001 puts it at variance with prevailing best practices and widely accepted principles of corporate responsibility. These include, *inter alia,* European Union's Voluntary Regulation, Eco-Management and Audit Scheme (EMAS), and principles outlined in the ICC Business Charter, the Coalition for Environmentally Responsible Economies (CERES) principles, CIA's Responsible Care Programme and the recent rise in stand-alone environmental reports. At the local level in South Africa, this contradiction is observable with some pieces of local legislation, particularly the Constitution of 1996 and the National Environmental Management Act (NEMA) number 10 of 1998.

The absence of adequate representation for the developing countries when ISO standards were being developed is another concern. According to UNCTAD (1996), although there are several stakeholders in the developing countries that need to integrate ISO 14001 into their thinking and planning, their participation in drafting ISO 14001 was very limited.

The historical past of ISO as the organisation championing the EMS has also been a source of unease. Morrison *et al.* (2000) argue that ISO's evolution from an institution that promulgates technical engineering standards to one that defines management standards with social and public policy implications has not been accompanied by a corresponding shift in representation of important stakeholders. The technical nature of ISO leaves the organisation without directive or coercive influence to promote environmental sustainability. As a result, what organisations do and how they do it is out of the area of influence of ISO. Organisations, therefore, are driven more by market (demand) and input (supply) issues than societal norms and values.

2.4 Concluding Remarks

This chapter has presented a review of literature pertinent to the study. This has helped to set the study context by examining trends in environmental management at three levels: global, the South African situation and the emergence of environmental management standards as well as their adoption at organisational levels. The chapter has also provided a general

critique of environmental management standards, though with a bias to ISO 14001, the reason being that it is presently regarded as the most widely accepted international EMS.

From the critique, it was possible to discern that after all, EMSs are not without problems as they might appear at face-value. In short, we need to be cognizant of potential inadequacies of an EMS, as Gray *et al.* (1993: 288) have advised: "EMS may be a necessary precondition for sustainability, but is most certainly not a sufficient condition." As mentioned in the introductory discussion, just the mere adoption of an EMS calls for change, but the situation even becomes more complex since an EMS needs to be integrated with other organisational elements. Therefore, it cannot be overemphasised that change and integration are at the centre of successful adoption and implementation of an EMS. To this end, in the next chapter, whose main aim is to present the study's analytical framework, discusses issues surrounding management, change and integration.

Chapter 3

ANALYTICAL FRAMEWORK

3.1 Introduction

The aim of this chapter is to present the analytical framework used in designing the study and considering the results. In order to facilitate an understanding and appreciation of the framework, an examination of four salient issues takes precedence. First is a historical note on management. This is meant to bring to the fore the link between mainstream management and EMS. This will set a platform for an understanding of the management principles that have been co-opted into EMSs. Second, since adoption of an EMS implies change, the next section will attempt to show the link between EMS adoption and organisational change, with a focus on sources of resistance to organisational change. Third is a discussion on the relevance of the concept of integration to management and lastly, the analytical framework (Mckinsey's *7-S model*) is presented and discussed.

3.2 A Historical Note on Management

Arguably, the concept of management is a product of human civilisation that was initially explored and put to the test in society's efforts to enhance the performance of organisations that emerged in the wake of the agrarian and industrial revolutions. Consequently, the debate about management is an old one, and it is contentious because behind the concept (management) are deeply held philosophical positions that tend to prescribe how people perceive the role of management in organisations.

The agrarian and industrial revolutions were accompanied by intellectual changes during which natural sciences started to enjoy a higher reputation than ever before (Haralambos and Horlborn, 1995). Scholars like Auguste Comte argued that "scientific knowledge about society could be accumulated and used to improve human existence so that society could be run rationally..." (cited in Haralambos and Horlborn, 1995: 54). In medieval times, management and organisation theories started to emerge, for example, the work of Machiavelli Niccolo who focused on power relations in organisations (Jay, 1967). Much

later, Henri Fayol's work drew attention to administrative practices in the organisation (Fayol, 1949).

The nineteenth century saw the beginning of the philosophy of scientific management, which is largely ascribed to Taylor (1911) because of his pioneering role regarding this approach to management. Also, from a sociological point of view, Max Weber advanced the theory of rationalisation on whose basis he presented what he thought was an ideal organisational structure called a *bureaucracy* (Henderson and Parsons, 1947). The human relations movement emerged still later and is exemplified by the work of Mayo (1945). The human relations movement explained organisational management from the perspective of social and psychological needs of employees. However, the inherent weaknesses of the human relations school to view human beings as if they existed without organisations highlighted the need for a revision to management thought (Luthans and Davis, 1992).

Thus, the human resources movement was born, and it explained organisational effectiveness from the point of view of motivating employees (Maslow, 1954 and McGregor, 1960). What has followed since can be loosely described as modifications to the early works, picking out positive aspects and integrating them with modern thinking, in this way serving as the foundation for the actual design and practice of modern day organisations. This has helped to shape modern organisation theory, and consequently our understanding of the concept of management. Against this background, it becomes appropriate to enquire what constitutes management.

3.2.1 What is Management?

According to Fuggle (1992: 3), "management refers to the execution of planned controls so as to achieve a desired outcome." In general terms, management seeks to enhance the order, structure, stability and resilience that an organisation needs to ensure its survival. As such, the role of management has come to be understood as that of ensuring that an organisation meets its planned goals through executing specified activities. It involves the control and making of decisions, usually based on a guiding policy (Armstrong, 1984).

Management entails making conscious decisions and ensuring commitment to the set objectives. An assessment of the different forms of management reveals that there are some common denominators, regardless of the sphere in which management efforts are being applied. If conceived from a traditional perspective, management is seen to consist of planning, decision-making and controlling (Luthans *et al.* 1988). Its empirical behaviours include setting goals and objectives, defining tasks needed to accomplish goals, scheduling employees, assigning tasks, handling day-to-day crises, deciding what to do, inspecting work, developing new procedures, walking around inspecting the work, monitoring performance data and doing preventive maintenance (Luthans and Davis, 1992).

Since management presupposes existence of many people doing different activities that need to be coordinated to meet an organisation's goals, communication naturally becomes of the essence. Hence, communication is an inherent role of management, which facilitates exchange of routine information. Observed behaviours arising out of communication include providing or receiving routine information, report writing and dissemination answering procedural questions, receiving and disseminating requested information and conveying results of meetings (Luthans and Davis, 1992).

With the above understanding of management, it is not surprising that EMSs are based on mainstream management principles. This is partly confirmed when one considers what ISO, for example, refers to as elements of an EMS (see figure 2.1). All these are issues at the core of management and their collective intention is to facilitate the meeting of stated organisational objectives, of which environmental protection should be only but a part. What seems to distinguish an EMS from general management is its application of management skills, principles and techniques specifically to environmental performance. Hence, it can be argued that when management skills, principles and techniques are applied to care for the environment so as to achieve environmental performance goals an organisation has set for itself, then we are dealing with environmental management. At the same time, when we are applying management skills, principles and techniques within a prescribed framework for purposes of environmental management, then we are dealing with an EMS.

The issue that is implied in the above discussion is that organisations have to deal with situations of uncertainty. In order to survive, there is a compelling need that they undergo some kind of continual transformation. This gives them the assurance that they are better able to cope with the various demands and pressures exerted on them by wider society. It cannot be overstressed that one of the main tasks of management is to deal with change. Elaborating further on this theme, Ways (1966: 6) contends that "management is the agency through which most changes enter our society, and it is the agency that then must cope with the environment it has set in turbulent motion." It is, therefore, necessary at this point to bring into the discussion the concept of change, and consider its implications in contemporary organisations.

3.3 Change and Contemporary Organisations

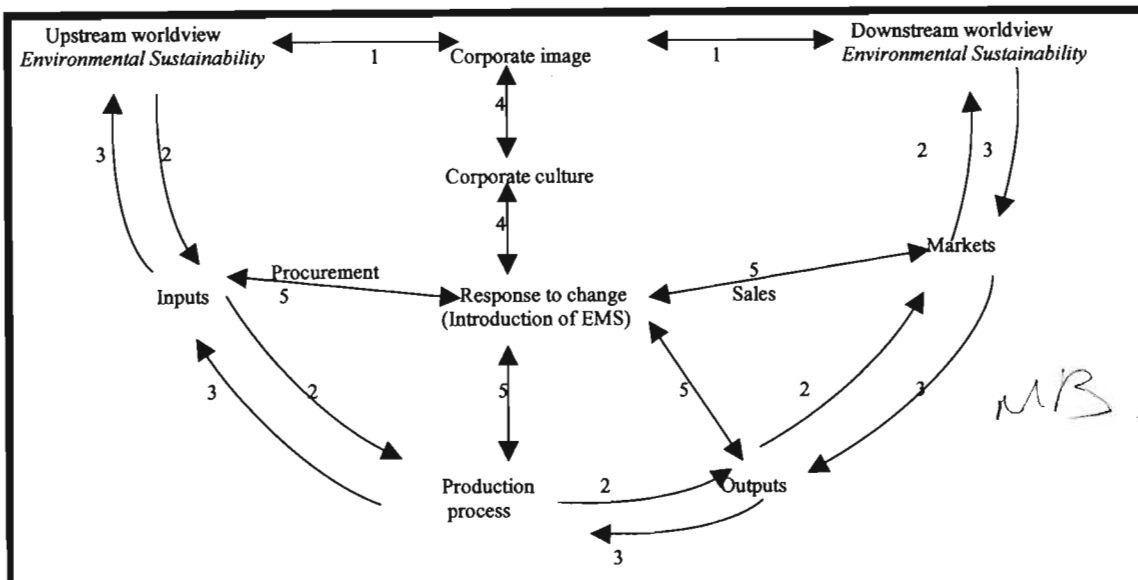
It is increasingly becoming apparent that just as change has permeated other sectors of society, organisations have not been left untouched. The alterations in norms, values, patterns and trends in the wider society have to be congruent with the various social systems of organisations (Osri, 1973). Failure to achieve this places organisations at the risk of operating at a tangent with society, a situation which is not only unhealthy for their very existence, but also negates their purpose in society.

As discussed in chapter two, organisations are now more than ever before becoming involved in environmental management. This is partly due to societal pressure for environmental sustainability, which has left in its wake a greater awareness of the environmental responsibilities of organisations (Welford, 1995). In brief, global trends in environmental management have shaped, and will continue to shape the worldviews of organisations (both upstream and downstream). Box 3.1 (page 31) illustrates this process diagrammatically, followed by a narrative description of what tends to happen as organisations develop their worldviews in response to environmental sustainability pressures.

3.3.1 Implications of Change for Organisations

As depicted in box 3.1, it can be argued that organisations create their worldview (upstream and downstream) largely as a way of protecting their integrity and identity. Both integrity and identity are founded on an organisation's recognition of its relationship with the

environment (biophysical and otherwise). This process of developing the worldview enables organisations to form a sense of self-identity, which is a self-constructed reality or projection of the organisation's interests and concerns (Morgan, 1986). The self-identity is formed as a result of an understanding of an organisation's history, its present and a desired future state (Roome, 1999). Based on this self-identity, an organisation is able to understand itself within its environment, and can therefore respond to the change emanating from its own understanding of its position within the wider society.



1. Corporate image is shaped by corporate culture and worldviews of upstream suppliers and downstream users/ consumers of products.
2. Worldviews about upstream suppliers influence procurement of inputs, which then has knock-on effects for production, outputs, markets and consequently worldview of down stream users.
3. World views of downstream users shaped by the market which in turn affects outputs and feeds back into productive procurement of inputs and moulds the worldview of upstream suppliers.
4. Corporate image is shaped by the worldviews (upstream and downstream). The manner in which this occurs is strongly influenced by corporate culture, which determines how responsive the company is to change.
5. Responsiveness to change is reflected in procurement, production, the nature of products and the approach to marketing.

Source: Developed as part of the study with the assistance of Professor C. M. Breen

Box 3.1: Development of worldviews in organisations

This scenario presents many implications for organisations because change is a phenomenon that organisations are facing with increasing frequency and severity. Change is driven by a continuous interplay of a variety of factors and their relationships. Clearly, unless management strategies are made in light of many internal and external factors, including the

various wants and needs of the diverse publics that a business must serve and rely on for its existence, an organisation's chances of survival are drastically reduced (Luthans *et al.* 1988). This entails that change cannot be addressed in a simple, single or specific strategy. Thus, if organisations are to effectively deal with the basic problem of change phenomena, a broad-based response is necessary. As such, reactive change in itself and for its own sake can contribute little. Failure to recognise this means that chances of an organisation replacing one set of problems with another of similar, or even larger proportions are raised (Osri, 1973). An effective strategy should endeavour to meet wide objectives, some of which are shown in Box 3.2.

- Continuous examination of growth of the organisation, together with diagnosis of the multiple internal and external influences affecting its state of being.
- Improvement in the manner in which problems are solved at all levels of the organisation.
- Development of groups within the organisation of formal and informal groups, which are effective and communicative.
- Development, which is appropriate to the situation being faced at any given time.
- A way for people within the organisation to learn from their experiences of success or failure.
- Development of a climate that encourages and channels creativity of people throughout the organisation.
- Maturity of individuals and groups and groups within the organisation as well as maturity of the organisation itself.
- Development of a system to which all employees within the organisation feel committed.

Source: Lippert, 1966 (cited in Clarke, 1994)

Box 3.2: Objectives to be met by change processes

In summary, change has a host of implications for organisations in terms of structure, purpose, role of management, roles and responsibility allocation, resource distribution, training, and communication, including the very survival of organisations. Put succinctly, change affects all the fabrics of an organisation, and it therefore needs to be managed. However, the process is characterised by different forms of resistance. Hence, it is appropriate at this point to bring to the fore the sources of resistance to organisational change.

3.3.2 Sources of Resistance to Organisational Change

There are numerous sources of resistance to change, but it is widely recognised that many organisational change initiatives tend to fall prey to organisational culture (Bennis *et al.* 1985; Senge *et al.* 1999 and Clarke, 1994). Organisational culture is a system of norms,

beliefs, assumptions, and values that determine how people in an organisation act - even when that action may be at odds with written policies and formal reporting relationships (Snyder, 1985). Such norms, beliefs and assumptions are a product of internal interaction of people within an organisation, and they are used in coping with problems of internal integration and external adaptation (Haralambos and Holborn, 1995). Clarke (1994) has identified several sources of resistance to change in organisations (Box 3.3). An analysis of these factors strongly suggests that resistance to change in an organisation lies with the individual perceptions of the proposed change, its implications, and how they see it affecting them as individuals and members of the organisation.

Fear of the unknown	Lack of information
Threats to status	Loss of team relationships
High anxiety	Fear of failure
Loss of control of one's identity	Feeling vulnerable and exposed
Threats to established skills	Lack of perceived benefits
Reluctance to let go	Threats to power base
History of previous custom	Low-trust organisational climate
Fear of looking stupid	Stress

Source: Clarke, 1994: 109

Box 3.3: Sources of resistance to change

Against this backdrop, it is clear that environmental management cannot be an exception from the many challenges presented by organisational culture. For example, with specific reference to change induced by pressure for sustainable practices, Ehrenfeld (1999) has described the initial reaction of organisations to the early environmental pressures as buffering. He adds: buffering was a response that left the basic set of corporate visions and norms unchanged" (Ehrenfeld, 1999: 229). The mention of norms in this case is a vivid recognition that organisational culture is a potential source of resistance to change. Senge *et al.* (1999) argue that while most organisational activities lead to change, the problem is that the resultant change is short-lived, and does not provide the anticipated outcomes in the long term. They posit that what is needed is profound change, which they describe as:

> "Profound change is used to describe organisational change that combines inner shifts in people's values, aspirations, and behaviours with 'outer' shifts in processes, strategies, practices and systems. ... In profound change, there is learning. The organisation does not just do something new; it builds its capacity for doing things in a new way - indeed, it builds capacity for on-going change. ... It is not enough to change strategies, structures, and systems, unless the thinking that produced those strategies, structures, and systems also changes" (Senge *et al.* 1999: 15).

By implication, the above arguments make a strong presentation on the need to address organisational culture if the internal barriers to change are to be overcome. As Peck (1994) has argued, if culture is not fully taken into account in the design of organisational initiatives (such as an EMS), the chance of failure is raised. To this end, Snyder (1985: 164) has also observed:

> " ... corporate culture has become so current that most managers would probably agree that their organisations have distinctive cultures - and that those cultures have dramatic impact on innovation, productivity, and morale."

Explicit in the discussion so far is the suggestion that there is an inseparable link between internal organisational processes (including organisational culture) and the successful adoption of measures aimed at organisational change. This means that unless the symbiotic relationship that exists between society and organisations is recognised, different types of friction are likely to occur. Recognition of this relationship demands that an organisation should be able to link its perception of the world (see 3.3.1 above and box 3.1) and its internal processes.

The continued sustenance and survival of organisations depends among other things, on management's ability to analyse their relationship with the wider society. This analysis should then be linked to the growth processes of the change (Senge *et al.* 1999) that an organisation is experiencing. In the context of this study, the worldview pertains to environmental sustainability (being pursued through an EMS) while the internal processes relate to the change(s) induced by the worldview.

As illustrated in figure 3.1, the pressures for change (A) have to be linked with an organisation's development strategy in order to bring about sustained change. The bottom part (B) is a model that seeks to explain the setting of the 'growth processes of profound change' into motion (Senge *et al.* 1999). An outline of these processes (R1, R2 and R 3) is as follows:

> "Investment in change initiatives [e.g. money, resources, time, meetings etc.] leads to new learning capabilities and personal results[4] (loop R1); more people involved and aware through informal networks (R2); and eventually the learning capabilities generate new business practices, business results, and increased credibility[5] (R3)" (Senge, *et al.* 1999: 54).

[4] This is the first source of reinforcing energy for sustaining deep change because it matters to them (Senge, *et al.* 1999: 46)

[5] Credibility of the change efforts comes with the feeling of "because it works" (Senge *et al.* (1999: 51).

This approach builds a cyclical process, which in systems terms may be referred to as a 'virtuous reinforcing cycle' (Senge *et al.* 1999). At the centre of the approach is the need to maintain momentum in the growth processes so that there is on-going enthusiasm and willingness to commit which should keep stimulating the other processes. In essence, the model suggests that unless there are reinforcing processes of personal and business growth, change is likely to be short-lived.

The model (figure 3.1) also strongly suggests the need to carefully address the psychological properties of the change process. It suggests that the growth stages should be experienced largely as a result of self-learning through a virtuous cycle. The inclusion of a learning system in the organisation as a means of organisational change is likely to produce positive results if it is able to stimulate conceptualisation, motivation and commitment (Argyris, 1990). In other words, change efforts need to address the sources of resistance to change (box 3.2) which by and large operate at the psychological and social levels. At the same, it means that delays in effecting a learning system within an organisation could have far-reaching consequences. The situation may even be exacerbated in the event of failure to address the accompanying consequences.

3.4 Towards Achieving Integration of Environmental Management Systems

Organisations are complex systems with a variety of interrelated parts. As such, the introduction and implementation of a management system presents many challenges for organisations. Generally, the existing system needs to accommodate the new system through the process of change. This implies, among other things, that change should not significantly disrupt the existing system. It should also contribute to the fulfillment of the shared goals of the other individual management elements and the system as a whole. Their success and continued survival partly hinges on the pace with which management efforts (such as an EMS) move them on to a path to integration.

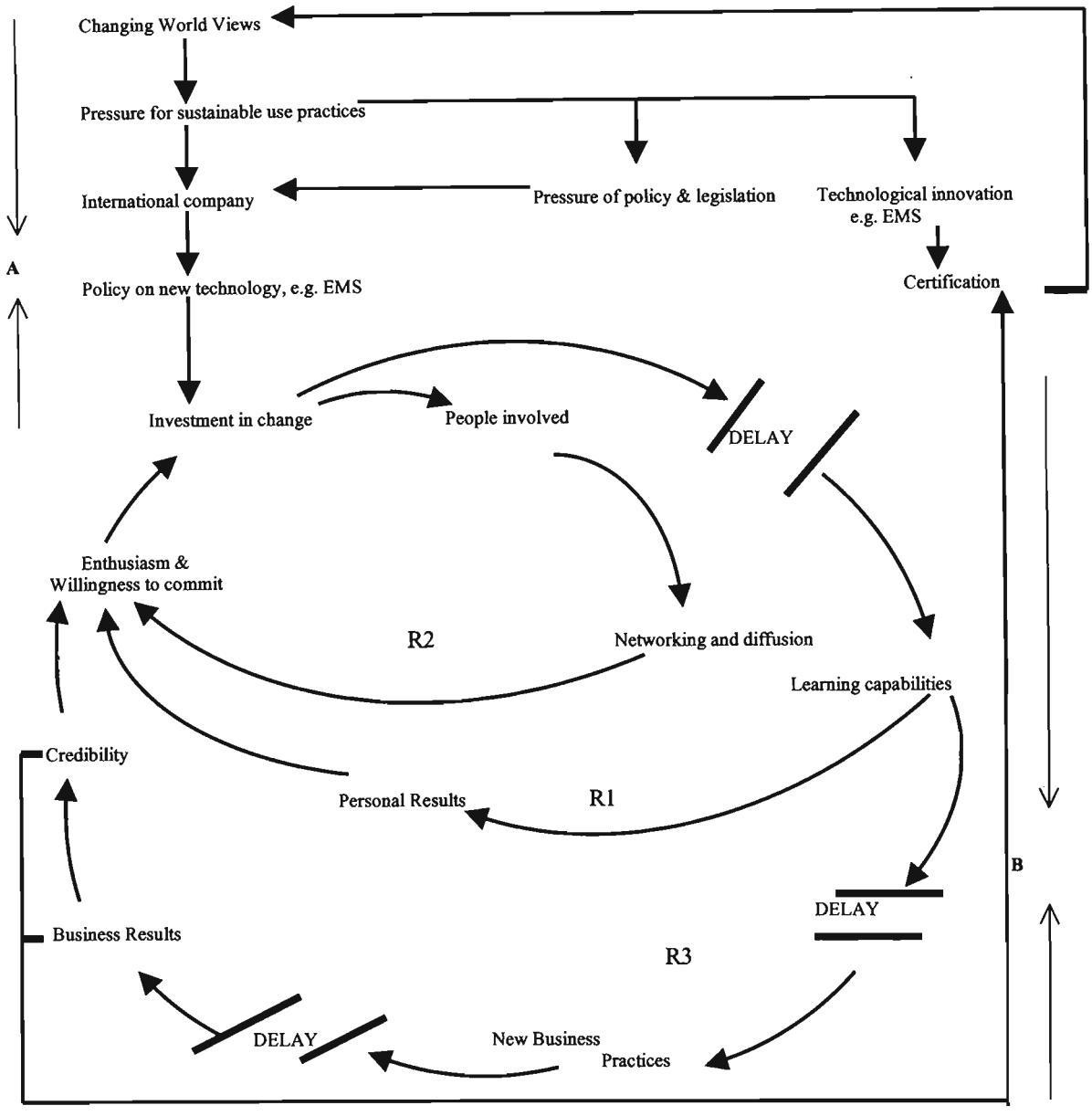


Figure 3.1: Linking environmental sustainability pressures (A) with growth processes of profound change (B)

Source: The top part (labeled 'A') was developed with the assistance of Professor C. M. Breen while the bottom part (labeled 'B') is from Senge *et al.* (1999)

However, as discussed earlier, the adoption of an EMS should not be seen outside the context of organisational development (OD). This is especially so if OD is understood to mean the "response to change, a complex educational strategy intended to change the beliefs, and structure of organisation so that they can better adapt to new technologies, markets, challenges and the dizzying rate of change itself (Bennis, 1985: 2)." The main challenge,

therefore, is to harmonise the changes likely to be brought about with the introduction of a new management system. For this to happen, there is need to understand the change processes as they occur and influence organisational circumstances.

As implied above, the whole idea about organisational management is predicated on the understanding that different functional strategies have to be harmonised. Since environmental management is increasingly being recognised as a corporate strategic area (Peattie, 1995), it is vital that it operates in harmony with other functional areas within an organisation. An EMS, which is by and large a strategic framework for managing the environment, is therefore to be treated as other strategic and operational aspects of an organisation. This facilitates its contribution to the achievement of the overall goals and objectives of the organisation in which it is being adopted. Hence, Sasseville *et al.* (1994:5) posit: "a company will receive the full value of ISO 14000 [or any other EMS] only if it sees the EMS as a business function to be integrated into all other business functions." In other words, a strategic posture is necessary to facilitate better results from the adoption of an EMS.

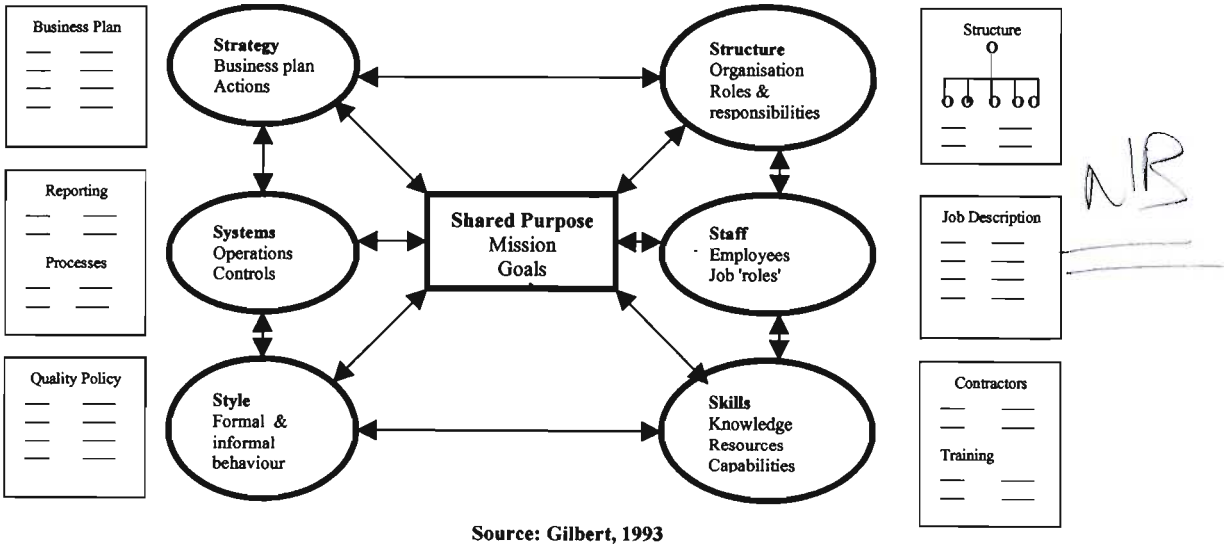
For integration to occur, it is necessary to ensure that management initiatives in the EMS are consistent with those decisions taken in other functional areas. The aim should be to provide a strategic fit between policy objectives of environmental management and the business necessities of the organisation. Integration should facilitate a situation whereby environmental management policies cohere both across policy areas and across policy hierarchies or structural arrangements in an organisation. Similarly, it should facilitate an environment in which environmental management activities are pursued by line managers, shop floor workers and other employees as part of their everyday work. In this way, there is a practical recognition of the change, thereby increasing the chances of an organisation's systems working in harmony.

From the above discussion, it can be argued that the essence of integration is to ensure that activities are coordinated and maximise commitment and organisational effectiveness (Luthans, *et al.* 1984). Hence, the success and continued survival partly hinges on the pace with which management efforts (such as an EMS) move them on to a path to integration.

This brings us to the gist of this chapter, i.e. to consider a model for integrating an EMS into corporate management.

3.4.2 Mcknisey's 7 - S model of business elements

One of the renowned models to depict organisational actions vis-à-vis the quest for integration is Mckinsey's *7-S model* of business elements (cited in Gilbert, 1993; Peattie, 1995 and Waterman, 1987) as seen in figure 3.2. The basic assumption of the model is that "an organisation as a whole will be skilled at something to the degree that the other six sibilants support that skill" (Waterman, 1987: 56). Furthermore, unless there is a shared purpose among the sibilants, chances of congruence among the sibilants will be reduced, thereby threatening the achievement of the shared or common goals. For the purpose of this study, it is goes without saying that the skill that is being sought is environmental management, and it is being pursued by way of adopting an EMS.



Source: Gilbert, 1993

Figure 3.2: Mckinsey's *7 - S model* of business elements (being applied to explore the integration of an EMS into corporate management).

Gilbert (1993) has provided a useful summary of the desired outcome of each of the elements in the model as depicted in table 3.1. Mckinsey's *7-S model* is premised on the understanding that for any organisational changes to hold, they need to be accompanied by necessary alterations in the following organisational elements: strategy, systems, style, structure, staff

and skills. These alterations to organisational elements become necessary in order to ensure that each element meets its part thereby creating a balanced management system (Gilbert, 1993).

Table 3.1: A description of Mckinsey's *7-S model* components

Element	Desired outcome
Shared purpose	To include improved environmental performance as a desirable behaviour, captured in the policy.
Strategy	To ensure that environmental performance criteria are integrated into the business plans of the whole and parts of the organisation.
Systems	To ensure that the day to day practices and procedures promote environmental performance
Staff	To ensure that appropriate staff are identified to enable the smooth implementation of environmental performance standards.
Skills	To equip staff and have access to necessary skills required in implementing environmental performance standards
Structure	To ensure that environmental performance management roles and responsibilities are defined and allocated.
Style	To ensure that managers reflect the environmental performance standards in the way they behave and use time, and recognize and reward appropriate staff activities.

Adapted from Gilbert, 1993: 29-30

The model holds that unless there is a strategy. working under a well-organised system with clearly defined roles and responsibilities among employees (who have been appropriately equipped with skills), the chances of any change efforts stirring an organisation in the desired direction become very slim. This calls for appropriate actions and decisions, which should all be seen as components of a more robust approach (a strategy) to dealing with organisational change as it relates to environmental issues. An organisation's environmental strategy is defined as:

> "The pattern or plan that integrates an organisation's major goals, policies and action sequences into a cohesive whole. A well-formulated strategy helps to marshal and allocate an organisation's resources into a unique and viable posture based on its relative internal competencies and short-comings, anticipated changes in the environment and contingent moves by intelligent opponents" (Quinn,1988: 3).

Additionally, change is supposed to be reflected in the behavioural styles manifested within the organisation, both formally and informally. The motivation to change should be given currency by a shared purpose, often in the form of a formal position outlining the organisation's commitment to the envisaged change, in this case by way of an environmental policy. The model further suggests that organisations should be seen both as a structure and a system. As a structure, they comprise different functional portfolios meant to deliver specific

requirements (e.g. marketing, productions, human resources, purchasing, finance, etc.). On the other hand, the systemic conception of the model is in conformity with the structural understanding of organisations, thereby underscoring the interdependence of the functional elements. So understood, none of the elements, on its own can give an organisation its whole character, let alone fulfill its objectives without the effective contribution of the other elements, individually and collectively.

The model contends that changes to an organisation have to be synchronized with most of the functions and elements (if not all), in order to ensure, *inter alia* that an organisation's identity, character and processes do not cease to operate in harmony. Hence, when an organisation undergoes change (as happens when implementing an EMS), there is a need to understand the change processes, and only then can meaningful incorporation of the new ideas entailed by the change be realistically brought on board.

3.5 Concluding Remarks

The main purpose of this chapter was to present the analytical framework to be employed in considering the results of this study vis-à-vis the integration process of the organisation chosen as a case study. However, it needs to be stressed that the model may be subject to critique, but it is considered appropriate for this study in that it makes intuitive sense and provides a framework for analysing and understanding the process of integration in organisational settings.

Chapter 4
METHODOLOGY

4.1 Introduction

The significance of methodology to research is unquestionable. This is because of its centrality to the production of data on whose basis theories can be tested, accepted or rejected so that conclusions may be reached (Haralambos and Holborn, 1995). As such, this chapter outlines the methodology by discussing the following: the case study approach (being the research design for the study), methods to explain the techniques used to gather data, data analysis, respondents' profile and limitations of the study. However, before focusing on the methodology, the introductory section of the chapter presents the criteria adopted to choose the organisation that was used as a case study. Following is a background on the organisation, as well as a presentation of the negotiations that paved the way for the study.

4.1.1 Criteria for Case Study Choice

The choice of an organisation to serve as a case study was not arbitrary. The organisation was to be consistent with the models in figure 3.1 and box 3.1 and supposed to meet the following criteria:

- A local manufacturing business with an international niche in its industry;
- Currently adopting an EMS;
- Big enough to have impacts;
- A large number of employees;
- Show willingness to participate in the study.

After careful consideration in light of the above criteria, a decision was made to approach Hulett Aluminium. On top of meeting the first four criteria, senior management at Hulett Aluminium showed a lot of enthusiasm and willingness to participate in the study from the start. This was further expressed in the level of cooperation and support rendered to the researcher during the process of data collection and thereafter. In part, the choice of Hulett Aluminium was motivated by a 1998 consultancy commissioned by the City Engineers office

in Pietermaritzburg that identified and subsequently included Hulett Aluminium in a data base of companies likely to contribute to hazardous and problem wastes arising within the Pietermaritzburg-Msunduzi area (Lombard and Associates, 1998).

4.1.2 Background on Hulett Aluminium

Established in 1948, Hulett Aluminium has a long history with South Africa in general and the city of Pietermaritzburg in particular. It employs nearly 2000 people and manufactures a broad range of rolled and extruded semi-fabricated and finished aluminium products. The product range includes foil, can stock, circles for cooking ware, flat sheet, building sheet, architectural and general extrusions (Tongaat-Hulett, 1998). The company's semi-fabricated products offer several downstream business opportunities to many companies that contribute to national economic growth.

Environmental issues are a common feature to most manufacturing companies and Hulett Aluminium is not an exception. As in any large manufacturing operation, there are various environmental issues the company is facing. Hulett Aluminium has historically been dealing with environmental issues as an operational activity, with a focus on regulatory compliance. At present, the company is in its early phases of implementing an EMS that was introduced in 1999. Since 1996, Hulett Aluminium has been undergoing a major expansion project for its rolled product operation, which was officially commissioned in November 2000. Without doubt, additional operations necessitated by the expansion project have added to the potential impact of the company's operations on the environment.

4.1.3 Negotiating Access

A common hurdle to the research process is accessing people, organisations and data. According to Burton (2000), this problem is accentuated in case study research because:

> "... securing access to people, organisations and data is necessary for the successful completion of any research report project, but it is particularly crucial in a case study research where the researcher may wish to spend a considerable amount of time with relatively few individuals or within a limited number of settings."

The above observation applies to this study, which explains why an introductory letter (Appendix 6) by the researcher's supervisor was written to set the negotiation process in

motion. The letter established contacts for purposes of the study within Hulett Aluminium and informed the relevant people about the nature of the study thereby stimulating interest and support for the study. More importantly, it sought permission for the study to use Hulett Aluminium as a case study.

After permission to conduct the study was granted, the researcher and the Hulett Aluminium's Environmental Manager met on several occasions. The researcher learned of the company's stage in its EMS, its orientation and added focus to the production areas (being the potential source of environmental impacts) compared to other areas within the company. This stage also involved discussions on those who were to be involved in the study by way of interviews and questionnaires. It was subsequently agreed to involve three main categories: top management (Directors), Area Managers, and Area Environmental Representatives (AERs) as the core respondents. This was based on the recognition that these three sets of employees were key to the company's environmental performance and adoption of necessary changes to enhance environmental performance.

The interviewing stage of the study was the point at which the researcher was mostly visible. Until that point, respondents had only known of the researcher's existence through the company's electronic mail system informing them about the study, and the introductory letter, which was centrally distributed via intramail by the company's Environmental Manager. When schedules were finally set, the Environmental Manager personally introduced the researcher to the respondents, apart from three to whom introductions were made by their respective Area Environmental Representatives (through prior arrangements by the Environmental Manager). The personal introductions by the Environmental Manager served to encourage the respondents to freely participate in the study and further demonstrated the company's commitment to the study. During the course of data collection, several debriefing sessions were held with the Environmental Manager to explain some of the issues that were emerging (and some of which attracted immediate attention. For example, most AERs expressed concern for not meeting as a group. Once conveyed to the Environmental Manager, the matter received attention. The debriefing sessions also facilitated exchange of views between the Environmental Manager and the researcher.

4.2 Methodology

Bailey (1982) defines 'methodology' as the philosophy of the research process. Haralambos and Holborn (1995) advise that methodology is concerned with both the detailed research methods through which data are collected, and the more general philosophies upon which the collection and analysis of data are based. The methodology for the study was based on an understanding of EMS in general as well as an understanding of the response of organisations to change. It also involved the identification and examination of EMS components and processes present in Hulett Aluminium together with consideration of the response patterns to change, which have been induced by the adoption of an EMS in the company.

4.2.1 The Case Study Approach

The research design adopted for this study was a case study. Burton (2000) has observed that despite the widespread use of case studies, there is little consensus on what the 'case study' actually constitutes. Broadly, a case as used in social sciences is seen to denote varying entities including an individual, an organisation, or any single phenomenon forming the subject of a study. With this broad understanding ascribed to the meaning of a case, it is not surprising that case study research has been defined differently, with variations quite noticeable across disciplines (Platt, 1988 and Yin, 1984). Some researchers contend that case study research includes a single case; otherwise the study is regarded as comparative and not case study (Burton, 2000). It has been further observed that although consensus seems to have been reached in social sciences with the recognition of cases as the building blocks for collecting data, there is still be some controversy on what should be regarded as 'a case' (Burton, 2000). For this study, an organisational studies definition by Yin (1984), which describes case study research as an empirical enquiry that investigates a contemporary phenomenon in context, was adopted.

Why opt for a case study?

There is controversy as when to apply a case study approach. Although situations may warrant a preferred approach,

> "in general, case studies are the preferred strategy when 'how' and 'why' questions are being posed, when the investigator has little control over events and when focus is on a contemporary phenomenon within some real life context" (Yin, 1984: 1).

Yin also advises that a case study approach is desirable in situations where the boundaries between the phenomenon and the context are not clearly evident and were multiple sources of evidence are used. Furthermore, case studies are often used in qualitative research. However, the two have often been used interchangeably (Burgess, 1991).

The nature of this study clearly falls within the domain proposed by Yin. The decision to adopt a case study approach was partly made on account of the predominantly qualitative nature of the study, and the contemporary phenomenon being investigated in a contextual situation being change in an organisation in respect of adopting an EMS. In addition, the case study approach is flexible because it permits the researcher to use different data collection techniques (see 4.4.2 below). The combination of data collection techniques helps to minimise the inherent weaknesses of each technique while simultaneously increasing the rigour of the data (Achola and Bless, 1988). The case study approach for this study was used to elucidate general issues for large organisations.

4.2.2 Methods

Methods can be defined as the research techniques or tools used to gather data (Bailey, 1982). According to the *Concise Oxford Dictionary* (1995), data refers to known things or facts used as a basis for inference or reckoning. It is also defined as raw, unevaluated facts, concepts or instructions arising out of a scientific enquiry (Hutchinson and Sawyer, 1994). The methods used to collect data were literature review, open-ended interviews, direct questionnaire interviews of 30 to 90 minutes' duration and content analysis. Each of these methods is discussed in turn.

Literature Review

A review of relevant literature was undertaken to permit an understanding of the subject matter by way of developing a conceptual framework. By conceptual framework is meant a researcher's current map of the territory being investigated (Miles and Huberman, 1984). The review of literature helped to acquaint the researcher with the past and present thinking surrounding the relevant concepts to the study. It also played a big part in directing and informing other stages of the study, including data questionnaire formulation, data collection and analysis of data.

Open- ended Interviews

These were held with top management (Directors), the Environmental Manager, Marketing Manager and the Packaging Specialist. The reason for choosing an open-ended approach was to enable free-flow discussion between the researcher and the interviewees. A list of guiding topics appears as Appendix 3. A generic approach was adopted as it enabled interviewees to talk about the environmental and organisational issues as they deemed fit. This was in contrast to an in issue-specific approach, which would have otherwise limited the scope of the interviews. However, the Packaging Specialist and Marketing Manager were interviewed with a bias towards their functional areas in order to get from them what their departments were doing about environmental management, and what roles they saw their departments playing in the near future.

Direct Questionnaire Interviews

These were used to collect information from the Area Managers and Area Environmental Representatives. The reason for this was that these two categories of employees play a leading role in environmental performance of their respective departments, as well as in the process of adopting change related to the company's quest to improve its environmental performance. The questionnaire was also used to solicit information from shop-floor workers and a chemist. Suffice it to mention that some questions needed a 'self-administered questionnaire' approach, for example those that required ranking. These were identified and each respondent was requested to answer them directly on the questionnaire at the end of the interview session.

The face-to-face approach

It is worth noting that the face-to-face approach used in both the questionnaire and open-ended interviews enabled the researcher to probe and make immediate follow-ups on responses. It made it possible to explore the contradictions and inconsistencies that arose during the interview process. This approach meant that unlike in the case of self-administered questionnaires, there were no cases of unreturned questionnaires. Since the researcher met each respondent in person, where necessary, follow-ups were made by email, telephone and in person.

Use of a tape recorder

All but one of the interviews were tape-recorded, with each respondent's permission. The decision to use a tape recorder was made in view of the fact that note taking could be slow, less accurate and reduces the possibility of quoting the respondents verbatim (Stroh, 2000). Since this study was predominantly qualitative, the need to use a recorder was simply compelling, as observed by Pile (1990: 217):

> "An analysis of language can only be carried out with confidence if there is an entire record of a conversation. Hastily scribbled notes ... are not accurate enough to be used in this way. Tape recorded-sessions provide the only viable data for this kind of analysis."

Content Analysis

According to Burton (2000), content analysis is a systematic and empirical method that has been developed for analysing documentary data. To do this, a set of procedures is used to make valid inferences from the text. The method can also be used to analyse visual and audio material for inferences about the sender(s) of the message, the message itself or the audience of the message (Burton, 2000). This study applied the method by focusing on the message of the sender (Hulett Aluminium) by way of reviewing some documents. However, study did not make a detailed content analysis (as would be the case if it were the only research tool being employed). As such, only three of the five steps proposed by Bailey (1978) were followed and are described below:

Draw of sample documents

The sample documents were obtained from Hulett Aluminium. In order to avoid the possibility of infringing the company's privacy, only documents that are in the public domain were used. A combination of 'accidental' sampling and 'purposive or judgmental' sampling methods of documents was used. The former permitted the use of documents as they were encountered while the latter allowed the researcher to make a decision on the appropriateness of each and every document.

Definition of recording unit

The recording unit can be any of the following: single word, the sentence, the theme, the paragraph or the whole text. The 'theme' was used in the study because it is not only a

mention of any one of the above categories, but it is also a flexible recording unit since it can be a word, paragraph, phrase or sentence.

Definition of the context unit

The context unit was limited to whether the statement in the recording unit was either positive or negative in relation to environmental management.

4.2.3 Data Analysis

According to Marshall and Rossman (1989: 112), "data analysis is the process of bringing order, structure and meaning to the mass of collected data." Through data analysis, the raw data are transformed into a useful form to support decision-making (Hutchinson and Sawyer, 1994). Data analysis differed for each of the three methods that were used to collect data: open-ended interviews; questionnaire and content analysis. Following below is a brief outline of the process followed in data analysis for the open-ended and questionnaire interviews (content analysis has been discussed above - see 3.3.1.4 above).

Open-ended Interviews *(and open-ended questionnaire questions)*

The open-ended interviews and open-ended questions in the questionnaire had one thing in common: they generated qualitative data. As such, a similar approach was used to analyse the responses generated by these two approaches in line with the advice that qualitative data analysis is a search for general statements among categories of data; or builds grounded theory (Marshall and Rossman, 1989). In essence, analysis involved listening to each recorded interview in full for its whole content. Transcribing was done alongside the listening and general statements were derived from each interview by way of noting words and phrases that kept recurring during each interview and across interviews.

Questionnaire Interviews *(close-ended questions)*

Analysis was done with the help of microsoft excel spreadsheets. This enabled the use of computer based statistical analysis tools. The approach was also used for some open-ended questions.

4.2.4 Respondents

4.2.4 Respondents

The respondents profile may be broken down as follows: Directors (6), Area Managers (13), Area Environmental Representatives (10) and shop-floor employees (8). The rest were: the Environmental Manager, Marketing Manager, a Chemist and the Packaging Specialist. Given the manner in which decisions were arrived at regarding who to involve in the study (see 4.1.3), it is clear that two sampling procedures were employed: purposive and accidental. Purposive sampling was limited to all the open-ended interview respondents and majority of the questionnaire interview respondents (Area Managers and Area Environmental Representatives Chemist, Environmental Manager, Marketing Manager and the Packaging Specialist). The accidental method was limited to the shop-floor workers because unlike the with the rest, there was no idea as to which shop floor worker was going to be interviewed from the onset.

It was the researcher's view that the quality of information provided by the respondents would determine the sample size. In any case, the number of respondents was to be within the time limitations of the study and compatible the researcher's ability to manage the arising data. As espoused by Sarantakos (1993), the sample size is considered enough when a point of saturation is reached, meaning that the possibility for new information is reduced drastically. By the time the researcher had met with 30 employees, information became repetitive, thus ruling out the possibilities for considerable new information through more respondents. Nevertheless, 11 more respondents were met in full recognition of Sarantakos' above-mentioned view. Thus, the total number of respondents was 41, a point at which the researcher was convinced that a sufficient level of respondents had been reached.

4.3 Limitations

As with any exercise of this nature, some limitations were noted as outlined below:

- There may have been a tendency toward socially desirable answers. Statements to the effect that environmental protection is undertaken for reasons of "social responsibility" for instance, should be viewed with some degree of caution. This is because of the

possibility of some respondents answering with the view to protecting their department or company's image.

- Although the researcher was on hand to make clarifications, there was a possibility of some distortion in the understanding and interpretation of some concepts on the part of interviewees. For example, most of the respondents thought of environmental aspects of their company/ departments in the negative sense only. However, environmental aspects do not only represent the negative elements, they also include activities products, or services that could interact with the environment in a positive way (Sasseville *et al.* 1996).

- Being qualitative research, it should be borne in mind that attitudes could also be influenced by the researcher translating his/ her intentions and by the respondents attempting to ascertain what the researcher requires. Efforts were made to avoid these biases. It is the researcher's considered view that this study is not meant to provide definitive conclusions, but rather to provide information on which further research might be a logical continuation.

4.4 Concluding Remarks

This chapter has discussed the research methodology used in the study. However, before proceeding to the next chapter, it seems fitting to conclude the chapter with an examination of the criteria for the presentation and discussion of results (the next two chapters). It is possible to draw these criteria from an examination and interpretation of the literature covered in the earlier chapters.

The discussion on management (see 3.2.1) has identified generic roles of management. When one considers, for example the elements of an ISO 14001 (figure 2.1), it is evident enough that an EMS is premised on mainstream management principles. Although the titles might differ in some instances, the expectations are largely the same - if not in practice, at least in principle. This ensures the techniques to establish and run a management system so that environmental performance is enhanced.

As such, the following parameters that are founded on principles of mainstream management, and have been adapted to EMSs will be applied in presenting the results: planning; implementation and operation, and checking and corrective action. Each of these will have sub-sets that shall be explained in the next chapter. In addition, there are two other parameters relating to knowledge, attitudes and practices and general considerations. An elaboration on the purpose of each of these will be given in chapter 5.

Chapter 5

PRESENTATION OF FINDINGS

5.1 Introduction

This chapter presents the study findings under the following headings: knowledge, attitudes and perceptions; planning; implementation and operation; checking and corrective action; and lastly, general considerations. Based on the methods used to collect data, respondents are disaggregated into two categories: questionnaire respondents (n_1) and open-ended interview respondents (n_2), representing 32 and 9 respondents respectively. Unless otherwise stated, the quantitative figures in the following results will refer to questionnaire respondents (n_1) alone. Percentages are rounded off to the nearest tenth. This chapter forms the basis of discussion in the next chapter by applying Mckinsey's *7- S model* to discuss integration of EMS vis-à-vis Hulett Aluminium.

5.2 Knowledge, Attitudes and Perceptions

In a study of this nature, information that helps to give an indication about the respondents' knowledge, attitudes and perceptions about issues connected to the theme is very important. In this instance, such information can reveal underlying issues that could either support or hinder environmental management initiatives. It was for this reason that this section was considered vital for this study. Enquiries were made on the following issues: importance of environmental management to the company (and departments); time allocation; knowledge about voluntary environmental management standards; participation in environmental management activities; necessity of the Hulett Aluminium's environmental policy and the perceived motives for environmental management. The results and commentary for all the issues in the section are presented in table 5.1.

Table 5.1:A summary of issues reflecting knowledge, attitudes perceptions about environmental Management.

IMPORTANCE OF ENVIRONMENTAL MANAGEMENT (n_1=32)

	Very Important		Important		Observations/ comments
	No.	%	No.	%	
at departmental level	19	59	13	41	Reasons for the importance of environmental management mainly reflected perceptions around legislation, company reputation and the potential threat to the environment related to some of the company's operations/ activities.
at company level	–	–	32	100	

TIME ALLOCATION FOR ENVIRONMENTAL MANAGEMENT

Sufficient		Too little		Observations/ comments
No.	%	No.	%	
11	34	21	66	A common concern was that production is taking its toll at the moment given the demands of the expansion project. It is unlikely that this pressure will recede in the short term considering that the production capacity is scheduled to expand from 50 000 tonnes to 200 000 at full operation (by 2003/4).

PERCEIVED MOTIVES FOR ENVIRONMENTAL MANAGEMENT (n=41)

Motives	No.	%	Observations/ comments
Legislation	37	90	Although market pressure is generally taken as a leading motivation for environmental management, this study proved otherwise.
Ecological/ social responsibility	32	78	
Own environmental consciousness of the company	28	68	
Image/ public relations	25	60	
Safeguarding o the company viability/ risk aspects	18	44	
Employee protection	15	37	
Market pressure/ market potentials or possibilities	13	32	

ENVIRONMENTAL POLICY (n_1=32)

Very necessary		Necessary		Observations/ comments
No.	%	No.	%	
27	84	5	16	All the respondents were aware of the environmental policy. They argued that the company's environmental management initiatives predate the environmental policy.

PARTICIPATION IN ENVIRONMENTAL MANAGEMENT INITIATIVES (n_1=32)

Yes		No		Observations/ comments
No.	%	No.	%	
32	100	–	–	This was expected considering that the majority of respondents were Area Managers and AERs. However, the chemist indicated participation in many roles, including training of shop-floor workers on hazardous chemicals used in her department.

KNOWLEDGE ABOUT VOLUNTARY ENVIRONMENTAL MANAGEMENT STANDARDS (n_1=32)

Yes		No		Observations/ comments
No.	%	No.	%	
7	22	25	78	The initial percentage of 'Yes' responses was 50%, but on further examination (checks and probes), it was evident that the extra 28% were not aware of any environmental management standards (e.g. some confused these standards with pieces of local legislation). The most common environmental management standard was ISO 14 000.

NB: Some questions had more than three possible responses, only those that attracted responses are reflected in the table.

5.3 Planning

Typical activities of the EMS planning process include the determination of environmental aspects and impacts; identification of legal and other requirements; setting of objectives and targets and developing appropriate environmental programmes (Sasseville *at al.* 1996).

5.3.1 Environmental Aspects and Impacts

The identification of departmental environmental aspects was clustered around two of the four possible responses as follows: 'very adequate' (22%) and 'adequate' (78%). All the respondents mentioned potential to impact on water quality arising from process water, effluents, emulsions and oils among others. The adequacy of mitigation measures against environmental impacts was described as follows: 'very adequate' (22%); 'adequate' (53%); 'moderately adequate' (25%). Hulett Aluminium has several environmental aspects with variations across departments because of the differences in the nature of operations, type of inputs, etc. across departments. Table 5.2 highlights some Hulett Aluminium's environmental aspects and their associated potential impacts.

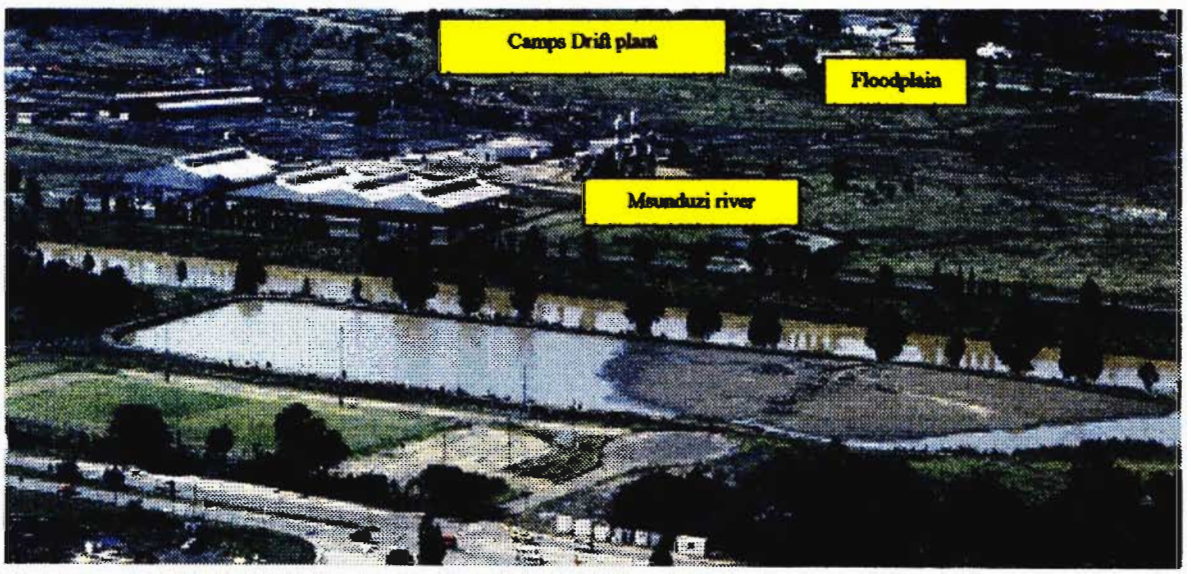


Plate 1: *The Msunduzi river:* Both the Edendale and Camps Drift plants of Hulett Aluminium are in close proximity to the Msunduzi river. Spills that find their way past the company's interceptor pits would cause serious environmental degradation.

Table 5.2: Some of Hulett Aluminium's environmental aspects

Environmental aspects	Significance, activity or source	Potential impacts
Oils Mineral	Used in cutting, rolling, lubrication and cutting processes.	Water pollution through spills, leaks via storm water system.
Emulsion	Used in the hot rolling, both as a lubricant and coolant.	Water pollution through spills, leaks via storm water system.
Chemicals Alkalies, acids, chrome, etc.	Production processes	Water pollution through spills and leaks, corrosion and human health effects
Solvents	Cleaning purposes	Fires, water pollution and human health effects.
Ambient air	Furnaces and vents start-up or incomplete burning of combustibles	Stack emissions and visual effects, human health
Sulphur Dioxide	Boiler and furnace operations (burning fuels containing sulphur)	Stack emissions, human health and visual effects
Chlorine	Chlorine gas facility on site	Leaks dangerous to human health
Odours MEK	Used as a solvent cleaning agent	Nuisance factor/ambient air in the environs
Evaporating oils	Production processes	Nuisance factor/ ambient air in the environs
Wastes *Solid waste and effluent*	Different production processes; office waste	Litter/ unpleasant surroundings, water pollution
Vehicles and machinery	Poor maintenance	Nuisance factor/ ambient air in the environs; human health effects

Source: Hulett Aluminium (1999a)

5.3.2 Objectives and Targets

The study revealed that while environmental objectives exist at company-wide level, individual departments do not work towards meeting department-specific environmental objectives. Each department has identified critical performance areas with potential for environmental impact, and it is around these that action is focused on a day-to-day basis. In recent times, pro-environmental action has been closely linked to internal environmental audits[5] whereby the identified concerns are included in an action plan for each department as corrective action requirements (see section 5.5.1).

[5] Internal environmental audits have been introduced in the wake of Hulett Aluminium's EMS, in addition to normal operational checks in all departments.

Presently, targets are based on corrective action requirements (i.e. they are action-based and not performance-based as they aim at having necessary remedial measures in place for inadequacies found during an audit). Respondents indicated that they expect target setting to improve alongside the progress in the EMS. As one respondent put it:

> *Currently, our targets are more on specific protection measures, such as bunds for certain types of machinery. We hope to improve on this type of targets as we move from being more or less qualitative to becoming quantitative. This will also enable the setting of interim targets to assess progress towards long-term targets..."*

Respondents also felt that the environmental performance indicators (Appendix 8) would in the long-term form the basis for target setting.

Responses to an enquiry into the target areas in which departments have so far implemented corrective action requirements are summarised in table 5.3. Evidently, actions aimed at protecting water pollution were a common occurrence as all respondents mentioned them. The results for those who did not know of any corrective actions (even after prompting) for each of the corrective action target areas were as follows: health and safety (22%); water use (28%); solid waste (53%); air emission (62%); energy consumption (56%); noise (59%) and packaging health and safety of the workers (22%); water use (47%); solid waste (59%) and packaging (84%).

Table 5.3: Perceptions of respondents in respect of areas in which departments have taken corrective actions ($n_1 = 32$)

Corrective action target areas*	Know of corrective actions taken				Do not know of corrective actions taken	
	Spontaneous responses**		Prompted responses***			
	No.	%	No.	%	No.	%
Water effluents/ storm water drains	30	94	2	6	–	–
Health and safety	25	78	–	–	7	22
Water use	15	47	8	25	9	28
Solid waste	12	38	3	9	17	53
Air emissions	6	19	6	19	20	62
Energy consumption	6	19	8	25	18	56
Noise	5	16	8	25	19	59
Packaging	2	6	3	9	27	84

NB: In some cases, $n_1 \neq 32$ because multiple ranking was permitted

–: means no response recorded

* The above classification was developed from literature identifying the common areas for attention in environmental management.

**Direct responses made without probing (prompt)

***Direct and indirect responses made after probing

Least mentioned were packaging-related environmental initiatives, a situation that may be attributed to the fact that most of the respondents work in operational areas and not 'end of production' or finishing lines. Packaging-related environmental initiatives are being handled company-wide, and they include introduction of reusable packaging on the local market. Hulett Aluminium has responded to growing international pressure, ensuring the use of biodegradable and recyclable materials as well as those without heavy metal content, such as lead and zinc. To this end, Hulett Aluminium's suppliers packaging materials have had to declare in writing in regard to heavy metal content, and contamination of packaging materials[6]. This is an internal measure by the company. Closely related to this, one of the Directors had this to say:

> *"Although we make efforts to control obvious environmental concerns with some of our customers such as monitoring presence of radio-active materials in incoming aluminium scrap, I think that we have not got to a sophistication where we are asking for the accreditation of all of our suppliers from an environmental point of view, and I must be very honest that I do not know at this point in this country how we would be able to measure to this expectation because I still believe we are still waiting for the necessary input for the things we must monitor and identify."*

The above-indicated delay in necessary inputs was blamed on the Department of Environmental Affairs and Tourism (DEAT), particularly in regard to the atmospheric pollution. This concern on the South African Atmospheric Pollution Prevention Act of 1965 is in line with the inadequacies discussed by Kidd (1997). Under the current Act, registration is based on proof that an organisation has adopted best practicable means for controlling atmospheric pollution. However, Hulett Aluminium has secured appropriate legal authorisation to operate all its furnaces, boilers and other installations that could lead to what the Act identifies as 'scheduled processes'.

Ambient noise ranked low, but it was reported to be receiving attention at both strategic and operational levels. Not only is it an occupational safety issue (company-wide), but also a potential source of concern for the surrounding communities, especially at the new site where there have been intermittent complaints from the surrounding neighbourhood. In order to reduce the noise impact on the surrounding communities, sound proof enclosures have been

[6] These measures are consistent with the models depicted in box 3.1 (page 31) and figure 3.1 (page 36) in that the Hulett Aluminium has more or less responded to external pressures for environmental sustainability. This response to external pressure is at the same time helping the company develop its own self-identity which is premised on the organisation's own understanding of its environmental niche in the wider society.

established in those production areas identified as noise sources at the Camps Drift site, as well as the erection of a wall fence at the Edendale site. Commenting on the reasons for the noise problems in spite of the Environmental Impact Assessment (EIA) that was conducted prior to the construction, one of the Directors had this to say:

> *"Our initial position was that the nature of the equipment to finish up on the Camps Drift site was going to be very similar to some of the equipment at the Edendale site [old plant]. We went ahead with noise measurements to see if it would affect the surrounding area. We found that the normal traffic noise at the site was more of a problem than the noise we anticipated generating in the new site, but we have been proven wrong because the noise that we have generated, because of slight changes to the production process does generate noise levels higher than a similar operation [at the old plant]. This means we have had to react after the event. Although we did the home work, we did not get the home work right ..."*

Seventy two percent (72%) of the respondents felt there was a huge time/ production pressure constraint. As one respondent observed:

> *"At the moment, the company is under a lot of pressure from different sources. On one hand, it has to meet the production targets and cave a niche in the highly competitive aluminium global market, and on the other hand, start to service the loan that facilitated the expansion project. Under this scenario of diverse pressures, some issues, despite being recognised as being important tend to suffer as a result, and environment is probably one of those issues. "*

Since departments operate independent of one another, there exists a possibility of friction from many facets, including environmental management, particularly in terms of objectives and targets. When asked for comments in this regard, some respondents (59%) indicated that they were not aware of the objectives and targets set in the other departments while the rest (41%) could not comment. Respondents were asked about how a situation of conflicting environmental objectives across departments may be resolved, to which one of them responded:

> *"Obviously, Area Managers can deal with such situations. Unlike before, we now have an Environmental Manager and he is constantly interacting with all departments. Any problems of this nature, should they occur now or in future, have a responsible person [Environmental Manager] to investigate them thoroughly with the full support of the concerned departments and ensure that outstanding issues are dealt with promptly. "*

5.3.3 Legal and Other Requirements

Law regulates some aspects of environmental management, hence knowledge of relevant laws is of the essence. In the same way, knowledge of other requirements (e.g. company policy, community agreements, etc.) is important. To this end, five key South African laws of relevance to safety, health and the environment were used to assess the awareness levels amongst the questionnaire respondents (Table 5.4).

Table 5.4: Knowledge of legal and other requirements

Legal requirements	Reference	Know of requirements				Do not know requirements	
		*Spontaneous**		*Probe***			
		No	%	No	%	No	%
The Constitution	Act 108 of 1996	7	22	4	13	21	66
Occupational Health Act	Act 85 of 1993	18	56	9	19	5	16
National Environmental Management Act (NEMA)	Act 10 of 1998	–	–	7	22	25	78
National Water Act	Act 36 of 1998	24	75	5	16	3	9
Atmospheric Pollution Prevention Act	Act 35 of 1965	13	41	8	25	11	34
Municipal by-laws		12	38	3	9	17	53

*Direct responses without probing. ** Direct and indirect responses made after probing

As evident in table 5.4, the most known law was the National Water Act. Most of the respondents made direct reference to the Act followed by the Occupational Health Act. There was no spontaneous response for the National Environmental Management Act (NEMA). Overall, spontaneous responses were limited, and even prompting did not help much. Probing solicited the following remark from one respondent:

> *"We are probably not fully aware of the legalities and specific laws, but we do know of the important issues that apply to our situation. This is probably not healthy, but I don't know whether full knowledge of the legal issues will change the way we are doing things because our first priority is not to impact the environment, regardless of the legal implications. Moreover, in some instances, you find that legal implications are lower compared to what we do in order to protect the environment. I guess there is an ethical attachment to the way we operate which transcends the legal requirements."*

No limitation was highlighted in relation to the incorporation of legal and other requirements in the departments' environmental management process. The rating of incorporation of legal and other requirements was as follows: 'very sufficient' (44%); sufficient (31%) and 25% did not comment. An outstanding aspect that came to the fore in this respect was the recognition of the specialist knowledge and guidance offered by Environmental Manager in relation to legal aspects of environmental management.

In addition to meeting the legal requirements, other requirements expressed by majority (59%) of the respondents were in-house expectations that are consistent with Hulett Aluminium's environmental policy and guidelines. The other requirement mentioned, by 31% of respondents was 'meeting community expectations' as it relates to the company's public image. Although acknowledged as a form of external pressure, the observation of

community expectations was largely seen as a matter of social conscience on the part of Hulett Aluminium as opposed to being pressured by the surrounding communities.

The last part of this section on planning involved an assessment of the respondents' perceptions of progress on planning related activities (table 5.5).

Table 5.5: Ranking of perceptions of progress recorded in planning related activities (1 = most progress; 4 = least progress) [$n_1 = 32$]

Planning activities	Ranking (1- 4)							
	1		2		3		4	
	No.	%	No.	%	No.	%	No.	%
Identification of environmental aspects/ impacts	25	78	7	22	–	–	–	–
Establishing relevant management programmes	15	47	6	19	6	19	–	–
Identification of legal and other requirements	2	6	7	22	20	63	3	9
Setting objectives and targets	–	–	10	31	7	22	20	63

–: means no response recorded

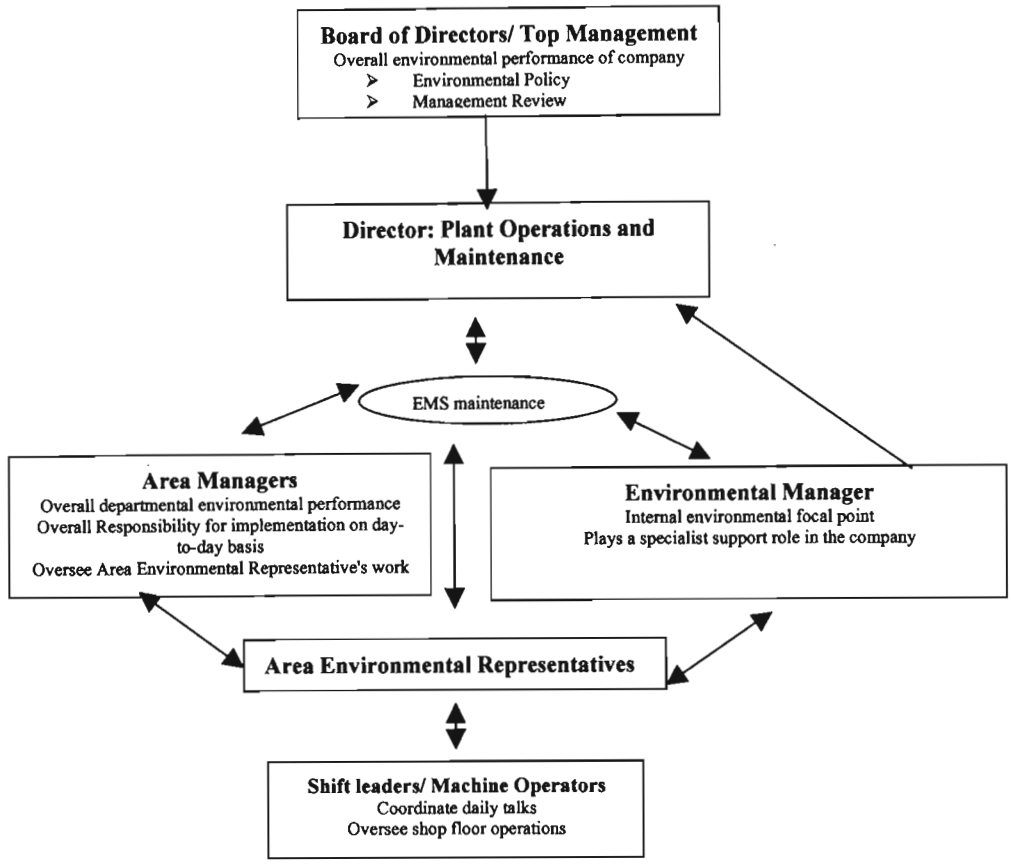
The most progress was perceived in relation to the 'identification of environmental aspects' which was identified by 78% of respondents. This was followed by 'establishing relevant management programmes' (47%). The 'identification of legal and other requirements' (63%) was in third place and in fourth position was 'setting objectives and targets' (63%).

5.4 Implementation and Operation

The implementation and operation phase of an EMS is when an organisation develops resources, capabilities, and organisational arrangements to ensure that the set objectives and targets can be met (Spedding, 1993). It involves the following components: structure, responsibility and resources; training, awareness and competence; communication; documentation and reporting and emergency preparedness and response. This section presents the study's findings in this respect.

5.4.1 Structure, Responsibility and Resources

Structure and responsibility were considered from two angles: company-wide and operational/ departmental levels. The organizational arrangements for Hulett Aluminium are as depicted in figure 5.1.



Source: Constructed from information gathered during the study.

Figure 5.1: Organogram of Hulett Aluminium's Environmental Management System

Company-wide level

In terms of actual implementation of environmental management, at the helm is the Environmental Management Representative (Director - Plant Operations and Maintenance). There is also the Environmental Manager who coordinates the company's environmental efforts on a daily basis. Box 5.1 itemises the roles of the key players in Hulett Aluminium's environmental management efforts.

Departmental /Operational level

Overall responsibility for environmental management falls within the ambit of Area Managers, but each department has an Area Environmental Representative (AER) to spearhead environmental management efforts. In addition, compliance is every employee's responsibility, and this requirement is given currency by the following statement: "every individual on site is responsible and accountable for minimising negative environmental

impacts under his/ her control work surrounds" (Hulett Aluminium, 1999a: 14). Also, shift-leaders and machine operators play a significant role in this respect.

Area Managers:

- Responsible for overall environmental performance in each area/ department

Area Environmental Representatives

- Keep a watchful eye on the environmental performance of the area.
- Report to the area manager any environmental performance concerns.
- Initiate action to (or request Area Manager) to correct any environmental exceedances.
- Assist in engendering environmental awareness in the workers in his area.
- Generate reports, monthly, on the area performance in terms of non-compliances and agreed monitored parameters such as effluent volumes and water consumption.
- Supply a copy to the Environmental Manager.

Environmental Manager

- Receive and collate all area environmental representatives' monthly reports into a report to the Environmental management representative.
- Arrange and carry out a monthly environmental audit of the plant.
- Coordinate and attend monthly meeting to consider and report on environmental matters.
- Arrange for a quarterly environmental meeting to be chaired by the Environmental Management Representative and attended by the area environmental representatives.
- Assist the Environmental Management Representative to produce an annual report to be presented to the Board.
- To draw up suggested annual environmental targets, objectives and targets.
- To draw up action plans for environmental emergencies.

Environmental Management Representative

- Has ultimate responsibility to ensure that in-house regulatory and environmental requirements are implemented and maintained.
- Attend any public meetings called to register Hulett Aluminium and the environment and be responsible for responding to public enquiries and complaints.
- Report to the Board, at least once per year, on the company's environmental performance.

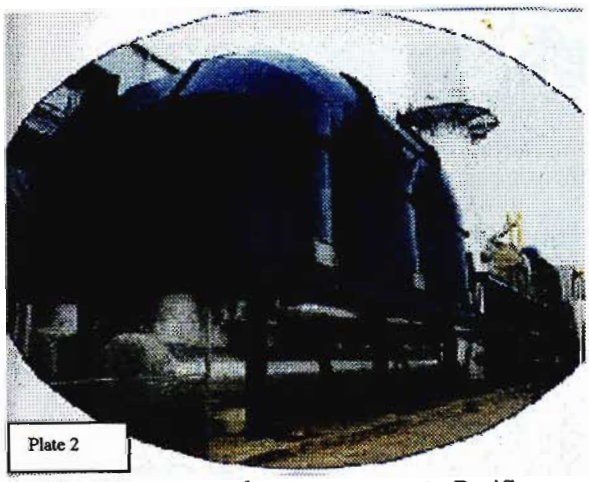
Box 5.1: Hulett Aluminium's responsibilities for environmental management

Resources/ budget

This study showed that although there was no specific budget for environmental management in the departments, funds are availed under normal operations, specifically the safety, health and environment budget. However, capital projects related to environmental protection are funded by way of requests from top management. All respondents noted that requesting funds for environmental related initiatives has thus far not been a problem as it receives due attention from top management.

The adequacy of funds was described as 'very adequate' (56%) and 'adequate' (44%). In fact, 50% felt that there has been an increase in environment-related funding with 25% stressing that the increase has been substantial. Some (25%) could not comment on funding trends due to lack of information. One of the Area Managers was particularly cautious in answering and had this to say on the perceived increase in funding towards environmental protection:

> *"... my budget for environmental protection through waste management will rise by 40% next year. Also, during the course of this year, environmental-related expenditure has been rising. This is a comparative increase because expenditure is a function of volumes generated in the production process, which makes me sceptical to say there has been an increase in funding. But in general terms, there is obviously an increase in terms of expenditure, which implicitly means money approved for a specific purpose, in this case waste management..."*



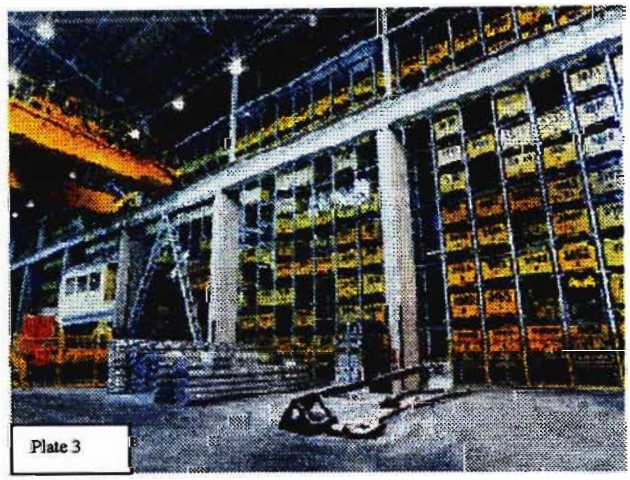


Plate 2: *Fume control incineration unit:* Purifies vaporous waste while also allowing for recovery of valuable energy.

Plate 3: *Multi-story Automatic Storage and Retrieval System (ASRS):* A vital component for Hulett Aluminium's remelt process. The remelt facility utilises the energy contained in the scrap aluminium organic coatings as a source of power in the melting process thereby reducing exposure of such particles to the atmosphere.

5.4.2 Training, Awareness and Competence

Three types of training are being provided: awareness training, procedures training and job-specific training. It was also reported that an induction video, in which the environment features prominently, was about to be finalised. The main providers of training include senior departmental personnel, the Environmental Manager, plant trainers and AERs. The one

programme that has resulted from the EMS is the training of AERs in all the Departments. The optimism surrounding the work of the AERs is partly conveyed in the following caption:

> "Hulett Aluminium's area environmental representatives began an intensive training programme on environmental auditing. Upon completion, they will be responsible for assessing the company's environmental performance indicators as required by the Tongaat Hulett Group. These eco-warriors will be developing a plan, which can be applied to increase the whole company's environmental awareness. Hulett Aluminium is aiming to get all its employees involved in taking an active role in limiting the effects of our production processes on the environment wherever possible... But good environmental practices are not only limited to the work place. Aluminate will also be telling you more about how you can play an active role in your community environment. Watch out for this exciting news as our area environmental representatives' planning begins to develop" (Aluminate, 1999: 4).

Table 5.6 illustrates the opinions of the respondents regarding the current training arrangements at Hulett Aluminium.

Table 5.6: Respondents' perceptions of present training arrangements (n_1=32)

Environmental management training is provided	Very True		True		Not true	
	No.	%	No.	%	No.	%
as and when necessary	17	53	12	38	3	9
on identified themes pertinent to the department	–	–	6	19	26	81
on general environmental concerns of the company	7	22	18	56	7	22
As part of routine safety, health and environment strategies	8	25	24	75	–	–
only to those in positions identified as requiring training are trained	9	28	18	56	5	16
to all departmental employees	2	6	3	9	27	84

– : means no response recorded

Slightly above half of the respondents (53%) found the statement that specific training sessions are conducted as and when necessary to be 'very true'. Seventy five percent (75%) found the statement that training is part of the routine safety, health and environment strategy of the company to be 'true'. The statement to the effect that all departmental employees have to undergo training in environmental management was regarded as 'not true' by the majority of respondents (84%).

5.4.3 Communication

Informal communication was widely reported (84%) as well as postings to the notice boards (75%). Communication is also through departmental and management meetings where various issues are presented and considered. As expressed by the Environmental Management Representative:

> *"... I attend management meetings every month where I highlight the nature of spills and other environmental situations. Together, we identify what we believe is probably the way forward as a policy for the company, but this is communication at management level as opposed to communicating down to the shop-floor with real strength. We are learning from our experiences, the situation should improve in the next 12 months...."*

Awareness is also partly promoted through daily safety, health and environmental talks that are conducted prior to the start of each shift. However, there were observations that the talks are biased towards safety and health. Hulett Aluminium's internal newsletter *(Aluminate)* serves as another means of communication. Among other things, the publication reports on pertinent safety, health and environment[7] issues as a way of raising awareness among company employees. To cater for all employees, some sections are translated into *isi Zulu.*

With the facilitation of the Environmental Manager, all Area Managers and AERs receive 'safety thought for the day' messages via the company's electronic mail system. This is a series of reminders about safety issues, but they also convey a lot of information vital to environmental protection and are posted on departmental notice boards as a form of awareness creation. The electronic mail system is also used in communicating aspects of non-compliance by way of digital photographs. Within the Pietermaritzburg-Msunduzi area, the company's main external communication link is the Pietermaritzburg Chamber of Commerce and Industry (PCCI) where it is represented on the Air Quality Forum.

The communication aspects were, however, seen as one area in which the company needed to improve. This may be inferred from the following statement by one of the Directors:

> *"I do not believe we are doing it very well currently, both internally and externally. Internally, we have been in a situation where we have many other pressing issues in terms to getting to grips with a new operation, changing the output of the operation substantially, so environmental concerns have been monitored more by the Environmental Manager, as opposed to being, at this point in time, part and parcel of the life of all the people that work within the organisation. What we have endeavoured to do, is to provide sound substance to the nature of more dramatic incidences that we have incurred by adding to it a cost, luckily we haven't had incidences that have impacted on the community, but certainly impacted financially on us..."*

Just above half of the respondents (53%) felt that the present efforts to communicate environmental management issues have led to significant improvement in environmental

[7] For example, in winter of 1999, the publication ran the first in a series of four articles which were meant to look at the environment, the way in which it affects people's lives, both inside and outside the factory, and what is needed to be done in order to contribute to a better environmental future (Aluminate, 1999). Competitions, each with a R200 gift voucher were used to motivate the workers to read the articles and answer the questions at the end of each article.

awareness levels among departmental employees. The rest of the responses were as follows: 'significant improvement' (25%); 'moderate improvement' (16%) while 6% did not know, as there has been no assessment to evaluate the communication efforts.

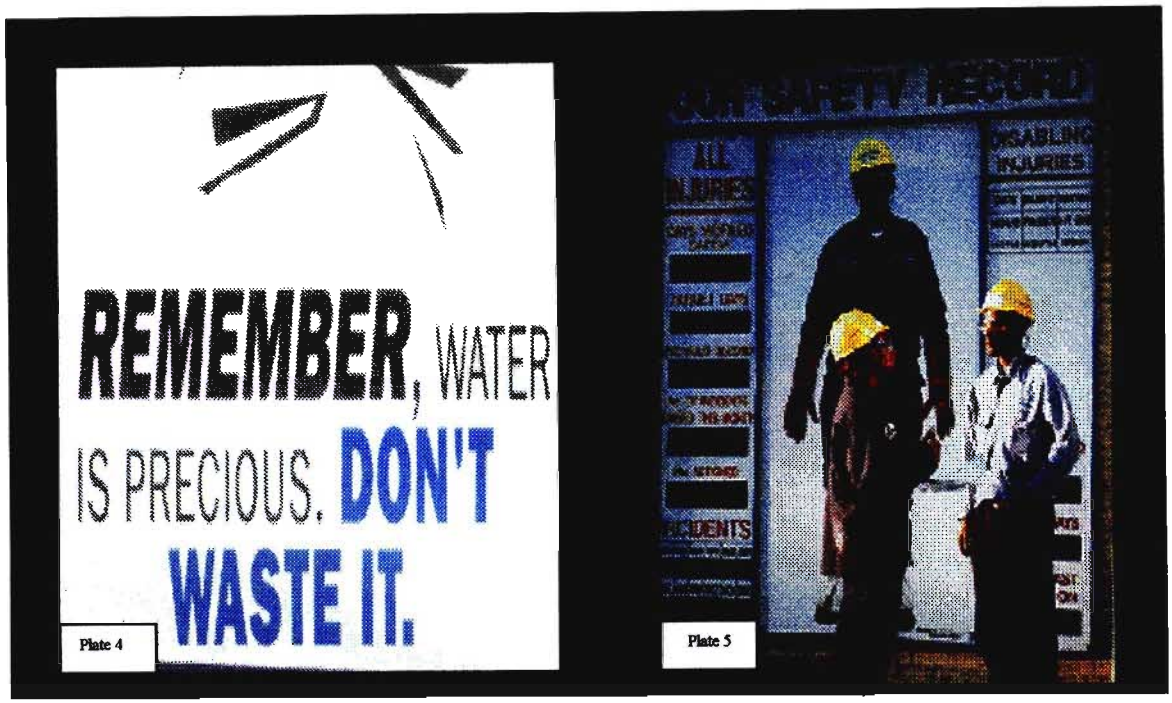


Plate 4: *A caption from Hulett Aluminium's internal magazine (Aluminate):* The quarterly magazine reports on a host of issues including safety, health and environment.

Plate 5: *Notice board in an operational area within Hulett Aluminium:* Postings to notice boards were noted as one of the means of communicating within departments.

5.4.4 Documentation and Reporting

All the respondents indicated that their departments kept environmental management documentation, with 53% saying that documentation was 'very current'. Furthermore, 25% felt that documentation was 'current' and a further 16% settled for 'moderately current'; 6% could not make any comments in this respect.

In terms of reporting, there are basically two forms: AERs' monthly reports and incident reports. The former are routine reports while the latter are prepared after an incidence. Area managers also report on environmental performance in their departmental routine reports, but they are not environment-specific. Suffice it to point out that most respondents noted that

documentation is improving alongside the progress of the EMS. As such, documentation and reporting is a competency that is being developed as the EMS evolves.

At company-wide level, one way of reporting is by the Environmental Management Representative who reports to the Board. Interviews with top management revealed that the company's shareholders have made a very clear policy position on environmental reporting. In this respect, one of the Directors noted that:

> *"...I find the use of the word 'pressure' to be inappropriate, but indeed the corporate shareholders have been quite specific in requesting reports on environmental performance of the company. This should not be seen as a form of pressure, but rather a very clear policy position taken by the shareholders and top management has a responsibility to fulfil all policy requirements, including the environment."*

Hulett Aluminium does not produce an environmental annual report for public circulation. Rather, it produces an annual report for internal circulation, which largely forms the basis for management reviews of the company's environmental performance. However, the Tongaat-Hulett Group (of which Hulett Aluminium is part) reports on the environmental performance of all its divisions in a section of the annual report. Consequently, reporting is in general terms of the Group's environmental performance, with highlights of some environmental aspects of the different companies, the intended courses of action and progress recorded. This approach, among other things, does not permit detailed reporting for any of the Group's companies. The situation is further compounded by the diversity of the Group's operations (textiles, sugar, aluminium, building materials, starch and glucose and property) because there are definitely considerable variations in terms of potential environmental impacts. When asked about the reasons for not producing a stand-alone environmental report, the Managing Director said:

> *"I have not formed a strong opinion about that, my personal opinion is that going too public by way of glossy magazines is not in itself an indication of good environmental performance. As a company, our belief is to do the right things, to protect the environment as opposed to the glossy reports. Whether this is right or not is certainly debatable..."*

Delays in reporting of incidences were also identified as potential barriers to effective environmental performance. One of the respondents had this to say in this regard:

> *" It is not always easy to detect environmental problems, and the situation is exacerbated by fear of employees to report. Despite our monitoring efforts, we occasionally detect spills a bit late. The situation was definitely going to be worse if we had no interceptor pits and a network of back-up and shut-off systems. The fear to report incidences, in my opinion will reduce as awareness improves. "*

Nevertheless, it is company policy to report all incidences, and this facilitates documentation and investigations. The Environmental Manager explained that the existing incidence reporting procedures are being revised to make them more useful in keeping with the EMS. Appendix 8 shows the incidence report form, which integrates safety, health and environment, as an example of recently completed documentation review. It was also pointed out that that in some cases, documentation is part of the legal requirements for authorised activities such as air emissions and effluent discharge. In such instances, the company keeps documentation relating to monitoring of effluents and emissions in accordance with the legislation, which is submitted to the relevant authorities.

Plate 6: *Examples of Hulett Aluminium's occasional documents:* These documents report on the company's environmental issues while the annual report (right) has a section that gives an overview of the Tongaat Hulett Group's environmental performance.

5.4.5 Operational Controls

Operational controls refer to those systems developed to ensure that people in environmentally sensitive jobs observe specified operational procedures in doing their work (Sasseville *et al.*, 1997). They help to assure improved environmental performance because by obliging employees operate within the policy framework of the organization. . Seventy five percent (75%) said they were 'demonstrably very effective' while 25% they were 'effective'.

Although most respondents (72%) were aware of the environmental manual, only 35% said they had used it at some point in the past. There was a general perception that the use of the manual on the shopfloor was low. Some respondents (22%) were not sure whether the version they had seen was a draft copy or the final copy. At the same time, 22% mistook the environmental manual for general environmental guidelines.

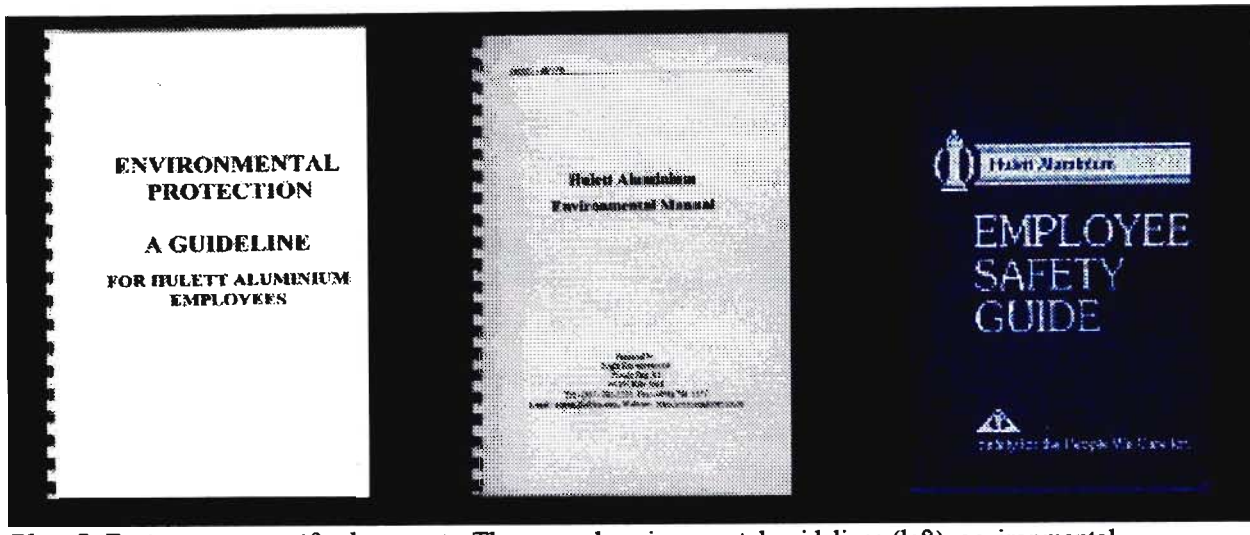


Plate 7: *Environment specific documents:* The general environmental guidelines (left), environmental manual (middle) and the employee safety guide (right) are all important documents for Hulett Aluminium's Environmental Management System They provide guidance to safety, health and environmental issues in operational areas.

5.4.6 Emergency Preparedness and Response

Emergency preparedness and response measures are an important feature of any well-planned EMS (Clements, 1993). All the respondents were happy with their departments' emergency response measures as 56% felt the measures were 'very sufficient' while 44% felt they were 'sufficient'. Safety and health procedures have been in place for a long time and are revised as and when necessary. To this end, one of the Area Managers remarked:

> *"Emergency response measures are firmly in place, but we are constantly seeking to put better measures in place. Such measures have to be practically relevant for effective implementation of the company's SHE programmes. Also, a lot of money has been spent over the years to put in place emergency preparedness and response mechanisms. These include construction of bund walls, back-up systems, automated fire extinguishers, display of data sheets for certain chemicals, alarm systems, interceptor pits and emergency showers."*

Like other elements of Hulett Aluminium's EMS, emergency response and preparedness measures are also being revised where necessary. The company also has a safety guide booklet (plate 7) that is availed to all employees at the time of being employed. The safety book's contents revolve around the following: the company's safety policy and safety organization, safety system, accident prevention, safety rules and regulations, first aid, safety legislation and off-the-job safety. The book also identifies some of the hazardous substances that are used in the company, including chlorine, caustic soda and sulphuric acid. It also outlines the general precautions to be followed in times of emergencies. As already discussed, the departmental heads play a pivotal role in all aspects of their department, and safety is not an exception as demonstrated below:

> Departmental heads are required to display a list of the hazardous substances used in their areas and what safety precautions apply regarding the handling the handling, and storage of such substances. It is required that all hazardous substances are correctly labelled and handled. Department Supervisors are required to educate employees on the hazardous substances within their work area, what precautions to take and what protective equipment must be used" (Hulett Aluminium, undated$_1$: 53).

Plate 8: *Precautionary measures for controlling potential environmentally hazardous incidents:* Hulett Aluminium's emergency measures include display of hazardous chemical data sheets (left); sign posts in chemical storage areas (right) and technology-based responses such as an automated fire extinguisher (middle).

There are safety programmes that deal with the prevention of accidents as well as minimising the resulting loss and damage to persons and property. Systems and procedures exist for carrying out investigations and inspections, reporting and recording incidents. The company also provides safety and health training and education to employees as well as protective equipment. For day-to-day management and monitoring of safety and health issues at company level, there is a Safety and Health Manager, who is assisted by Safety Officers and Safety Representatives. As with other functions, Area Managers are responsible for Safety and Health aspects of their respective departments. There are also safety committees in all the departments.

In order to capture the respondents' perceptions on the progress recorded in the implementation and operation of the environmental management system, a ranking question was asked for the different implementation and operation components (table 5.7).

Table 5.7: Ranking of perceptions of progress recorded in implementation and operation related activities (1 = most progress; 6 = least progress) [$n_1 = 32$]

Implementation and operation activities	Ranking (1 - 6)											
	1		2		3		4		5		6	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Structure and responsibility distribution	8	25	6	19	4	13	7	22	12	38	5	6
Training, awareness and competence creation	7	22	9	28	6	19	15	47	10	31	–	–
Operational controls	20	63	8	25	4	13	–	–	–	–	–	–
Emergency preparedness and response	9	28	12	38	11	34	6	22	–	–	–	–
Environmental management documentation	3	9	4	13	13	41	5	16	7	22	8	25
Environmental management communication	10	31	5	16	7	22	–	–	3	9	12	38

NB: In some cases, $n_1 \neq 32$ (or 100%) because multiple ranking was permitted
–: means no response recorded

The most progress (position 1) went to operational controls with 63%. The rest of the responses were as follows:

- Position 2: emergency preparedness and response (12 respondents or 38%).
- Position 3: environmental management documentation (13 respondents or 41%)
- Position 4: training, awareness and competency creation among staff (15 respondents or 47%);

- Position 5: structure and responsibility distribution among staff (12 respondents or 38%);
- Position 6: departmental communication on environmental issues (12 respondents or 38%).

5.5 Checking and Corrective Action

The key issues considered under checking and corrective action include: monitoring and measurement, non-conformance, preventive and corrective action, records and environmental management audits and reports (SABS, 1996). However, this section of the study will highlight environmental management audits because the other components can be discerned from the earlier sections of the results. In addition, attention will be paid to the concept of management review because of its relevance to the entire EMS process.

5.5.1 Environmental Management Audits

A system of internal regular audits has been introduced as part of the EMS, with AERs playing an active role. In addition to coordinating the audits and preparing audit reports, the Environmental Manager sets objectives for each audit exercise, and discusses them prior to the start of an audit. Presently, the thrust of the audits seems to be to monitor internal compliance with the company's environmental policy and operational requirements, and not with performance targets. No external auditors have thus far been hired for departmental audits.

All the respondents identified recommendations as an integral part of the audits. Following an environmental audit, a report is produced and made available to the concerned department. Corrective action requirements (CARs), as identified and judged by the Environmental Manager and other members of the audit team, are presented in each audit report. Each department responds to the audit report by developing an action plan specifying target dates for all the CARs and identifying the persons responsible (e.g. table 5.8).

Table 5.8: An extract from action plan/list arising from an audit

Existing items	Responsibility	Action	Target date
Effluent plant capability	CS	What can the plant handle?	30/3
Sump pump for HS basement	SM/ CJH	New one needs to be purchased	30/6
Bund wall height to be raised	CS	Bund wall too low. Needs to be raised. BKS is investigating. In process.	Done
Chips in bags causing oil mess	GP	Order placed for three bins	31/8

Plate 9: *An example of an outcome of environmental audits:* At Hulett Aluminium, internal audits, among other things help to identify environmentally risky situations. In this plate, an audit exercise found drums stored in an unbunded area (contrary to company environmental guidelines). Any spill from the drums would have easily entered the storm water system (note the stormwater drains in foreground).

At the moment, costing is not part of audit, but Area Managers and departmental staff make reviews of the cost implications of the CARs. Commenting on the audit system, one Area Manager said:

> *"Once we receive a copy of the audit report, we supply the Environmental Manger with an action list, showing the dates and the persons responsible for the CARs and we make sure we comply. The cost implications entailed by the audit are largely the responsibility of the department to follow-up, if necessary taking up the matter with top management."*

Prioritisation is mainly by way of setting target dates for which each of the identified CARs is to be completed. Further follow-up on CARs is in the subsequent audit exercise.

In regard to the most vital action(s) that have arisen from the audits, most respondents (78%) said that there has been more focused attention on the issues raised in the audits than was previously the case, and there is a commitment to the target dates for ensuring that CARs are implemented. Audits also provide data for internal decision making; to motivate continuous improvement and to provide data for external reporting. They also form the basis of the company's internal environmental report as well as the reports to shareholders. As regards the perceived benefits of the audits, all respondents felt there was an improvement in the internal capacity of the departments and the company to identify non-compliance aspects and take appropriate remedial measures. Expressing confidence in the system, one of the Directors anticipated further benefits:

> *"This approach will produce a common focus and help the departments to see that a lot can be achieved with everybody's commitment. Already, some areas of weakness where we need to focus our efforts are continuously being identified, and it will help us generate data to show what can be achieved as well as developing company motivation to do so."*

5.5.2 Management Review

Management review denotes the process whereby top management considers the performance of the EMS. The main aim of management review is the notion of continuous improvement, which according to Sasseville *et al.* (1996) occurs when management continually reviews information on performance of the EMS, compares this with performance to the environmental policy, objectives and targets, and looks for ways to improve performance.

Sixty percent (60%) of the respondents could not mention specific actions arising from management review. The few responses (40%) obtained centred on approvals for capital expenditure in view of environmental concerns. The general feeling of the respondents was that operational issues that could impact the environment negatively are departmental responsibilities, but there were certain crosscutting issues that needed attention at company-wide levels. So far, management reviews have resulted in company-wide initiatives based on reviews on the company's environmental aspects and their potential environmental impacts.

Box 5.2 gives an insight into some of the activities deriving from management reviews, in this case specifically relating to water use and pollution. However, all the respondents felt

that top management was giving due attention to environmental management. This was partly attributed to the fact that environment is part of the agenda for monthly management meetings and Board meetings.

... on a larger scale, Hulett Aluminium has already begun implementing actions to reduce its water usage and the possibility of water pollution. These actions include:

- Modifying certain cooling towers to eliminate overflows into the storm water system.
- Changes to certain operations will provide better control and management over cooling towers, eliminating overflows and discharges.
- Construction of new interceptor pits, together with modifications to current interceptor pits, will intercept and contain small spills and contaminated run-off from the sites, thus avoiding pollution of the Msunduzi river.
- Construction of appropriate bunding facilities around certain facilities will contain possible spills and prevent contamination of the storm water system.
- Establishing appropriate procedures for the management and control of oil and chemical drum storage on site will reduce the risk of spills.
- Scaling down of remelt operations on the Edendale site [old site] will reduce he volume of dross on site and its associated water pollution risk.
- Identification and mapping of the storm water systems, thus helping to develop overall understanding of water pollution risks and the preventative measures and management controls required.
- Compiling of emergency response procedures for spills and report documentation for recording environmental incidents.

Source: Aluminate, 1999

Box 5.2: An example of initiatives arising out of management reviews

In order to get the perceptions of progress in checking and corrective action related activities, a ranking exercise was conducted. Table 5.9 shows the responses of the perceived progress recorded. Each bar in the figure represents the number of respondents to the questionnaire.

Table 5.9: Ranking of perceptions of progress recorded in checking and corrective action-related activities (1 = most progress; 5 = least progress) [$n_1 = 32$]

Checking and corrective action activities	Ranking (1- 5)									
	1		2		3		4		5	
	No.	%	No.	%	No.	%	No.	%	No.	%
No conformace, preventive and corrective action	26	81	9	28	2	6	–	–	–	–
Management review	7	22	–	–	5	16	3	9	–	–
Environmental management audits	3	9	18	56	10	31	–	–	12	38
Monitoring and measurement	–	–	3	9	15	47	10	31	7	22
Record keeping	–	–	8	25	6	19	12	38	12	38

NB: In some cases, $n_1 \neq 32$ (or 100%) because multiple ranking was permitted
–: means no response recorded

The most progress was reported in non-compliance preventive and corrective action (81%). The rest of the results were as follows:

- Position 2: environmental management audits and reports (18 respondents or 56%)
- Position 3: environmental management audits and records (15 respondents or 47%)
- Position 4: record keeping (12 respondents or 38%)
- Position 5: management review

5.6 General Considerations

This section comprises those aspects that are pertinent to the study, but were deemed either inappropriate to be covered in the preceding sections. These include organisational culture, barriers and drivers to environmental management, incentives/ reward systems and departmental comparisons.

5.6.1 Organisational Culture

Organisational culture, as discussed in chapter 3 can be a leverage or barrier to organisational initiatives. Respondents were asked for their views regarding beliefs, systems or practices that have either supported or opposed change. The responses by the majority are summarised by one of the Area Managers:

> *"... this is a very progressive company that encourages interaction, not only through social events, but also work-related activities. Through Departmental Action Forums, ideas are presented and considered, and at monthly management meetings, the same happens. There is a lot of interaction between top management and middle management, as well as between senior departmental staff and shop floor workers. Intra- departmental interaction is on a daily basis. This arrangement facilitates the communication of ideas and changes are generally welcome."*

Most respondents (70%) felt that the systems that prevail in the company facilitate change, and they mainly made reference to the on-going efforts to link environmental management with safety and health. This, it was explained, was because the company has traditionally attached a lot of importance to safety and health, and by bringing environment on board, its recognition is in the long-run likely to enjoy the same status amongst the workers. Despite this, there were concerns that environment is presently not enjoying the same status as safety and health at present, a situation they largely ascribed to the infancy of Hulett Aluminium's EMS.

The emphasis on safety and health is both a barrier and opportunity for environmental management. As a barrier, the practices are focused on direct health and safety risks compared to indirect risks from environmental degradation. As an opportunity, it has helped

to accommodate environmental issues, for example with regard to funding of some environmental issues, they are provided for under the safety, health and environment (SHE) budget. The accommodation of the EMS is further exhibited when one considers incident-reporting documentation has been altered to include a component on environmental incidences. Overall, respondents felt the company has an open-door approach, which encourages participation at different levels, mainly by way of meetings, submissions and suggestions. The company also participates in national and local events, and has partnerships with many other organisations. In a way, this approach probably helps the company to integrate its own systems with those it learns from others by adapting them where necessary.

5.6.2 Barriers and Drivers

Any organisational initiatives are likely to face those elements that will resist the planned change. These elements are known as barriers. At the same time, there are instigating elements and they tend to be supportive to such initiatives, namely drivers. Table 5.10 and 5.11 present the perceived barriers and drivers of environmental management at Hulett Aluminium.

Table 5.10: Perceived drivers to environmental management ($n_1 = 32$)

Drivers	No. of respondents	% of respondents
Legal pressures/ statutory obligations	32	100
Own consciousness of company/ top management or environmentally conscious business policies/ company policy/ shareholders	30	94
Company image/ public relations	25	78
International markets/ sales related considerations	18	56
Cost savings	15	46
Employee protection	13	40
Public pressure	8	25
ISO listing prestige	5	15

NB: Multiple responses were permitted

The four most perceived drivers were legal/ statutory obligations (100%), own consciousness of company (94%), company image/ public relations (78%) and sales related considerations (56%). Although statutory obligations were perceived as the leading driver, interviews with top management revealed that the company's desire is to observe the legal requirements as the minimum expectation, both in the short term and long term. One Director pointed out that this has been partly demonstrated in the company's stance on the expansion project from

two angles: the commissioning of a consultancy for an environmental impact assessment in 1994 for the new plant before this became a legal requirement, and the company's decision to select equipment based on stringent European and American environmental performance standards.

Table 5.11: Perceived Barriers to environmental management ($n_1 = 32$)

Barriers	No. of respondents (n_1)	% of respondents
Individual attitudes	30	95
Time/ production pressure	27	82
Communication	24	75
Training and awareness	22	73
Incentives for workers	17	53
Limited knowledge on legal requirements	12	37
Perceived cost implications	8	25

NB: Multiple responses were permitted

The four most-mentioned barriers were time/ production pressure (95%), individual attitudes (87%), communication (75%) and training (73%). Not listed in table were barriers identified by less than 22% of the respondents, namely insufficiently developed procedures and systems, perceived funding and cost implications, old machinery and under-reporting. One of the two respondents who mentioned under-reporting stressed:

> *"A lot is being done in terms of environmental management, but perhaps all the efforts should be highlighted to both employees and the community. I feel the current reporting format gives more prominence to safety and health, perhaps I should take it upon myself to be more exhaustive in reporting performance in my department."*

5.6.3 Departmental Comparisons

Perceptions on how the respondents felt their departments compared with the others were sought. Majority (56%) felt they were the same as the other departments while 31% felt their departments were slightly better. Only 13% felt their departments were much better and only one respondent felt his department was much worse. However, the one respondent who said his department was much worse was quick to point out that the reason was not because of bad work practices, but the old machinery, which uses oil as opposed to gas, which is considered to be a cleaner source of energy and therefore, more environmentally friendly.

A similar question was raised with the company Directors on how they perceived their company in relation to other companies in the aluminium industry. The response was

generally that the company was as good as any other company in the world in those departments with modern equipment. The converse was also said to be true, that is, the company was as bad as other company anywhere in the world in those departments with old equipment. In this respect, the Director of Technology said that the company has been undergoing an expansion phase, which has facilitated the installation of modern equipment and upgrading machinery to meet environmental requirements. However, it was noted that not all the equipment is up-gradable, hence some old equipment is still in use because it is still productive to use. In order to keep abreast with other aluminium companies, Hulett Aluminium has signed technology partnerships with various international aluminium companies (Tongaat Hulett Group News, 1999). These partnerships are helping in training, exchange of technological information and elevating the company's manufacturing processes, quality and environmental management (Tongaat Hulett Group News, 1999).

5.6.4 Incentives/ Reward System

Incentives or rewards are generally seen as one way of boosting performance among employees as they encourage positive attitudes (Luthans *et al.* 1988). At Hulett Aluminium, the provision of incentives in efforts to promote environmental performance is presently not overt. Rather, the reward system is in terms of general safety, health and environment excellency by departments. The issue of incentives for environmental management evoked a lot of debate among respondents, both for and against incentives. There was a strong concern against monetary incentives, with one respondent arguing:

> *"What more does a person want than a clean environment, not just within the factory but also outside. Indeed, recognition should be considered for better environmental management practices, but focus should be on changes resulting from good working practices as opposed to technology or installations. But at the same time, innovative ideas that may lead to improved environmental performance need to be recognised, but not necessarily in monetary terms."*

Closely linked to incentives were concerns on the absence of intra-departmental and inter-departmental competitions in environmental performance. It was argued that that such competitions would serve multiple purposes: raise the profile of environmental issues (thereby raising awareness), encourage participation and motivate for innovation and expose laggards.

5.7 Concluding Remarks

This chapter presented the findings of the study, both from the interviews and the questionnaire. As mentioned earlier, adoption of an EMS implies change. It has been argued earlier (especially in chapter 3) that organisational change efforts need to be integrated with other organisational elements and processes if an organisation is to benefit from the proposed changes in the long term. Thus, chapter 6 will use the results presented in this chapter to accomplish the main purpose of this study, i.e. to ascertain the efficacy and value of Mckinsey's *7-S model* to EMS integration.

Chapter 6

Mckinsey's *7-S* Model and EMS Integration

6.1 Introduction

In chapter 3 (section 3.3), attention was drawn to the necessity of integrating management systems (including an EMS) into overall organisational management. In the context of this study, integration is concerned with the enhancement of synergy among the different roles and responsibilities spread across individuals and functional areas in regard to an organisation's environmental performance. Integration permits an approach of dealing with longer term environmental issues as part of strategic management as well as day-to-day practices in operational areas. Thus, the aim of this chapter is to examine the integration of an EMS into organisational management by drawing on Hulett Aluminium's experiences as presented in the previous chapter. In doing this, the discussion will apply Mckinsey's *7-S model*. This will be followed by an evaluation of the model, highlighting its strengths and weaknesses as well as the implications for its future use.

6.2 Applying Mckinsey's *7-S* Model

Before applying the model, it should be pointed out that the research responses suggest, at least among the respondents, that environmental management at Hulett Aluminium is in a transitional stage. This is acknowledgement of the need for integration to be process driven, incorporating feed-on and feed-back systems. Also, there is wide recognition that most issues being dealt with are processes rather than one-off events. The same position could be said of Hulett Aluminium's quest to integrate environmental management into overall organisational management. Presently, there is considerable evidence to suggest that this process is in motion.

In the following application of Mckinsey's *7-S model*, a deliberate decision was made to start with 'shared purpose' because of its centrality to the model (Figure 3.2). Otherwise, no prioritisation or order has been assumed in the presentation and discussion of the 'S' components (shared purpose, strategy, structure, systems, staffing, skills and style). Each of

the 'S' components is accompanied by a caption of the desired outcome if integration is to be achieved as presented by Gilbert (1993).

Shared Purpose

***Aim**: To include improved environmental performance as a desirable behaviour, captured in the policy.*

In this respect, there is need to consider how Hulett Aluminium is attempting to promote shared values about environmental management. It is also necessary to understand whether or not there are any fundamental ideas about environmental management and to consider the ways they are being promoted in the company. In addition, is the company doing anything to make its position on environmental management known to outsiders?

In chapter 5, it has been mentioned that Hulett Aluminium has developed an environmental policy (Appendix 7). An environmental policy is one way of demonstrating organisational commitment to environmental management (Netherwood, 1996 and Spedding, 1993). An article contained in the company's internal magazine (Aluminate), entitled: *'Hulett Aluminium updates environmental policy',* reported that Hulett Aluminium's Managing Director had endorsed the environmental policy statement and that it was applicable to all of Hulett Aluminium's plants and offices through out South Africa (Aluminate, 1999: 2). The Managing Director indicated that the main reason he signed the policy was to demonstrate top management's commitment. He was also quick to acknowledge that the policy was a product of teamwork as well as looking at the way other companies had formulated their environmental policies, but tailoring it to be consistent with Hulett Aluminium's situation and business environment. This process of being ready to learn from what other companies are doing is what Roome (1999) calls *organisational mimicry*, a common characteristic among those organisations willing to learn (Argyris, 1990).

Dissemination of the environmental policy has so far been done using different approaches. Prominent among these is written documentation, including the aforementioned internal magazine (Aluminate, 1999). Others include the environmental manual (Hulett Aluminium, 1999a), as well as the general environmental guidelines (Hulett Aluminium, 1999b), both of which are meant to be used by different categories of employees, especially those in

operational areas and those whose jobs could pose environmental problems if not properly conducted.

Occasional documents by different departments and top management have either made reference to the policy or reflected it within the document. For example, a document entitled: *'Aluminium and the environment'* a production of the marketing department contained a full version of the policy (Hulett Aluminium, 2000a). The booklet is generally on environmental aspects of aluminium in the building industry and the global effects of aluminium. It also talks about recycling and aluminium energy balance, and environmental responsibility at Hulett Aluminium, the section in which the environmental policy is captured.

The above illustrates that Hulett Aluminium is making efforts to convey its position and commitment regarding the environment, both within the company and outside. Worth noting is the fact that the current policy is an updated version, implying that Hulett Aluminium had a fresh look at its environmental niche and re-evaluated its objectives in light of its operations and activities. Such a sense of shared purpose fosters desirable behaviour at least at the senior level. It also highlights statements about the company's vision and purpose. The policy conveys the company's ideal situation (i.e. a dream of what should be) in regard to its environmental performance. In this way, the policy serves to bring the people and systems constituting the company together, thereby creating a common understanding for action. This behavioural and cultural change in turn gives direction to environmental protection activities. The fact that the environmental policy is applicable to all of Hulett Aluminium's offices and plants in South Africa makes it suitably positioned to play the role of engendering 'shared purpose' in regard to the environment throughout Hulett Aluminium.

Strategy

Aim: *To ensure that environmental performance management roles are integrated into business plans of the whole and parts of the company.*

Closely linked to policy is the concept of strategy, or the central idea around which an organisation attempts to develop its programmes and projects to achieve its goals for environmental management. It also entails the essential considerations needed to promote environmental performance. In particular, strategy draws attention to the extent to which environmental management roles are integrated into business plans (Gilbert, 1993). This is

because strategic moves help to operationalise the way in which the policy objectives are to be realised in an organisation (Luthans, *et al.* 1984).

An illustration of the incorporation of environmental imperatives into business plans may be seen in regard to Hulett Aluminium's expansion project. In particular, the technological upgrade that Hulett Aluminium undertook on its old plant, as well as the precautionary principle that was observed in procuring equipment for the new plant were both based on central ideas (strategy) to establish an operation that was environmentally safe to operate (Hulett Aluminium, 1996). In pursuance of the goal to procure clean technology, a multi-functional team was constituted and "traveled [and consulted] extensively to identify and choose the best technology available to match the business plans" (Hulett Aluminium, 2000b: 12). This is an illustration of a strategic consideration incorporating environmental imperatives, in this instance from an industrial equipment selection point of view. An *ad hoc* set-up was used to bring together professionals to develop appropriate specifications for an environmentally sustainable operation. Consequently, the equipment that was procured and installed conforms to international environmental standards, and as one of the Directors put it:

> *"...take for example the flexible remelt at Camps Drift [new site], it can operate anywhere between two cities in Germany [knowing that Germany environmental standards are highly rated worldwide] because of the stringent specifications we set out for the equipment to make our production as environmentally friendly as practically possible using clean technology..."*

Hulett Aluminium is also on record as having undertaken an environmental impact assessment (EIA) prior to this requirement (EIA) becoming mandatory in South Africa in accordance with the National Environmental Management Act no. 10 of 1998. This is evidence of a strategy to address environmental impacts, in this case by way of a decision that anticipated legal requirements for environment-related industrial activities. Had this not been done, the expansion project would have faced a lot of problems, especially that NEMA was only promulgated two years after the construction works were initiated. Box 6.1 gives an idea on what transpired in the quest to include environmental considerations in the expansion project.

From the early stages of project feasibility study, Hulett Aluminium has shown strong commitment to the consideration of environmental in all phases of the development. Talbot and Talbot were commissioned to conduct a preliminary environment impact assessment of the proposed expansion programme, report titled: "Proposed expansion programme of Hulett Aluminium at Camps Drift, Pietermaritzburg - Preliminary assessment of environmental impacts". On the basis of this and a subsequent report by Walmsley Environmental Consultants (Pty) Ltd (WEC), titled: "Comments on the legislative requirements and an environmental strategy for the Hulett Aluminium rolled products expansion programme at Camps Drift", WEC were appointed to prepare an Environmental Management Plan (EMP) for the Project.

Consideration was given to all aspects of the biophysical and socio-economic environment, including: geology, climate, topography, soils, surface water, ground water, water quality, air quality, noise, fauna, flora, land use and zoning, services and infrastructure and socio-economics. In addition, the interested and affected parties were consulted in order to obtain their concerns and suggestions regarding the project.

Source: Walmsley Environmental Consultants, 1997: 1

Box 6.1: Walmsley Environmental Consultants' impressions about Hulett Aluminium's expansion project environmental considerations

Structure

Aim: *To ensure that environmental management performance management roles are defined and allocated.*

The differentiation of roles, the need for supervision, accountability and other management requirements necessitate some form of organisational structure. Child (1977) perceives structure as comprising all the tangible and regularly occurring features that help to shape an organisation's members' behaviour. In reviewing the integration process vis-à-vis structure, it is vital to look at whether or not there are new appointments, reporting requirements, re-allocation of roles. It is also necessary to examine the reporting relationships and requirements. The study's findings on the roles and responsibilities regarding Hulett Aluminium's EMS are presented in chapter 5 (sub-section 5.4.1) and reference is made to Hulett Aluminium's organogram on environmental management roles and responsibilities (see Figure 5.2 and Box 5.1).

Hulett Aluminium has not established a single department to specifically address environmental concerns (and those which may arise externally). Rather, all departments are responsible for the management of potential environmental impacts that could arise from their operational activities and processes, while the Environmental Manager provides

specialist advice where necessary. This means that responsibility for environmental management is spread across and coordinated at different levels in the company.

The training of AERs as a cross-departmental team that is responsible for driving the necessary changes to improve environmental performance is a structural change with its origins to be founded in Hulett Auminium's quest for environmental management. However, as mentioned earlier, compliance is every employee's responsibility, and this position is given currency by the environmental manual, general environmental guidelines and the safety book, all of which put emphasis on individual responsibility for environmental management.

The above suggests that there has been a deliberate effort on the part of Hulett Aluminium to analyse the roles and relationships of its employees with a view to explicitly organising for environmental management. In addition, specific approaches have been established (some more are being developed) to ensure control and coordination of environmental performance related activities (e.g. reports, assigning responsibilities, assigning operational areas' environmental performance to Area Managers, etc.)

The adoption of an EMS has engendered new reporting requirements for the Environmental Management Representative (i.e. to the Board); the Environmental Manager (to the Environmental Management Representative) and the AERs (to Area Managers and the Environmental Manager) while Area Managers are increasingly being compelled to report on environmental performance as part of their routine reports. In short, environmental management gets its impetus from the Board, which assigns a high level of importance to environmental management. It therefore follows that since top and middle management work towards translating environmental management ideals into action by implementing policies and ensuring that environmental responsibility is part of day-to-day in operational areas, they serve to carry the environmental impetus forward.

Staffing

Aim: *To ensure that appropriate staff are identified to enable the smooth implementation of the environmental performance standards.*

Employees are a vital component for any management system and this is also true for an EMS. In this respect, there is need to examine what staff are there, at what levels and their

levels of skill and competence (this is elaborated on under skills below). It is therefore necessary to ask: What has Hulett Aluminium done in terms of staffing vis-à-vis the EMS and improving competence of staff?

A review of the findings shows that environmental management at Hulett Aluminium has traditionally been the responsibility of manufacturing area teams under the leadership of respective Area Managers. However, it has since been recognised that just as much as these manufacturing teams benefit from the expertise of for example, the Training Specialist under the Human Resources department, the same approach could be applied to enhance environmental performance. Hence it can be argued that the recruitment of a full time Environmental Manager (for the first time) has been done in keeping with Hulett Aluminium's "manufacturing strategy which is built around effective area teams, strongly supported by specialists ..." (Hulett Aluminium, 1999c: 2). The Environmental Manager plays a specialist function and coordinates environmental management efforts of the company on a day-to-day basis. This emphasis on process within a decentralised system provides for long-term sustainability of the EMS. In addition, although environmental management is an integral responsibility for Area Managers, AERs have been introduced as a link between departmental supervisors and shop-floor workers. The AERs have since been trained and are responsible for assessing environmental performance and making suggestions for environmental improvements in the company (Hulett Aluminium, undated$_2$).

Skills

Aim: *To equip staff and have access to necessary skills required implementing environmental performance standards.*

The relevance of skills for employees to perform their tasks effectively and efficiently is unquestionable. An organisation needs to create opportunities to develop its employees' understanding and general capacity concerning the environment. So far, Hulett Aluminium has conducted training for AERs and the company's training master plan incorporates environmental training for different categories of employees. The commitment to training is also explicitly highlighted in the company's environmental policy. Training is both intra-departmental and company-wide. Training has further been provided for in view of the Hulett Aluminium's expansion project's added demands in terms of skills for the employees. A

commitment of over R15 million was made to training of more than 700 employees in many aspects including environmental management (Hulett Aluminium, 2000b: 33). In the words of the Managing Director:

> "This investment in the continued development of our people is part of our primary objective to ensure that every employee has a thorough understanding of his or her particular field. We encourage the acquisition of skills, knowledge and experience that will assist in delivering performance requirements. By growing our own talent, we are also facilitating the fulfillment of our employees' potential and career aspirations" (Hulett Aluminium, 2000b: 3).

Reference to career aspirations in the above quote illustrates the long-term view being taken by Hulett Aluminium. The Human Resources Director also observed that for certain positions, measures are undertaken to assess the levels of environmental awareness and skills of prospective employees as part of the recruitment and selection process (i.e. treating environmental considerations as an integral part of the criteria for hiring new staff). In short, the hiring of staff for certain positions has incorporated the environmental necessities, meaning that suitability for a job is not just tied to one's qualifications only. In this way, Hulett Aluminium is able to employ people with prior knowledge and skills for certain aspects of environmental management as opposed to entirely having to train them. In short, the fact training has been recognised and provided for is indicative of the recognition of the importance of the capacity of employees in contributing to environmental management.

Style

Aim: *To ensure that managers reflect the environmental performance standards in the way they behave and use time, and recognise and reward their staff activities.*

Style calls for attention to aspects of symbolic behaviour as demonstrated by people within an organisation in relation to environmental management. This is based on the understanding that an examination of those aspects that tend to receive more attention, especially as reflected in terms of allocation of time as well as rewarding or providing incentives can help give create an impression of an organisation's style.

Although most respondents recognised the importance of environmental management to the company (sub-section 5.2.1), the majority felt that time allocated for environmental management was too little, with the majority of the respondents adding: "could be better". In other words, there was a general feeling that the time spent on environmental management is too little, which can be translated to suggest that environmental management receives less

attention. It is, however, not possible to jump to the conclusion that this is so because environmental management is less important. Another common feeling was that production pressure is high, but they also observed that there have been marked improvements in recent times, with a lot of optimism being expressed for the future. However, all the respondents were of the opinion that environmental management was receiving attention at different levels, with a majority of them saying it was a day-to-day concern in the production areas.

Rewarding employees is a central aspect to style. In the case of Hulett Aluminium, it is clear that the rewarding system is not explicitly tied to environmental performance alone (section 5.6.4). Rather, incentives for environmental performance are treated as part of the broader safety, health and environment portfolio. In a way, this is a demonstration of the need not to consider environmental performance as a separate entity, which is in line with the spirit of integration. However, most literature suggests that if environmental performance is to receive favourable reception and attract positive attitudes amongst employees, there is need for deliberate efforts to clearly show recognition of those initiatives that can contribute to the promotion of environmental improvements (Sasseville *et al.* 1996, Spedding, 1993 and Clements, 1996). Other authors like Clarke (1994) feel strongly about rewarding. Clarke (1994: 27) argues: "the rule is – expect it and reward it or forget it!"

There are other aspects relating to organisation, employee resourcing, performance management and employee relations that point in the direction of style. With regard to organisation, as discussed under structure and staffing above, there is a very high likelihood that the employment of the Environmental Manager has served to demonstrate the Board's commitment (as well as top management's) to improving environmental performance. The same goes for the fact that the overall management of environmental performance falls within the direct ambit of a Director (with executive level authority). These actions suggest that their values and behaviours have changed to the extent that they wish to do better than they are currently able to do. In short, all these are non-verbal communications coming from top management to show their support and position for environmental management, as well as their desire to see improved performance in environmental management throughout the company.

In terms of employee resourcing, not only are environmental considerations taken into account when hiring staff, but they are also provided for in employee development (i.e. implementation of learning activities to enhance knowledge, skills and to prepare individuals for better performance of their work).

Systems

Aim: *To ensure that the day-to-day practices and procedures implement the environmental performance standards.*

Systems denote the procedures through which daily work is fulfilled. Hence, unless there is a careful revision of systems, desired outcomes of intended actions risk being mere pipe-dreams. This situation also applies in relation to an EMS, which implies that environmental improvement should be accompanied by alterations to existing procedures as well as introduction of new ones if necessary.

The fact that a decision was made to adopt an EMS reflects Hulett Aluminium's desire to ensure that appropriate changes to procedures and practices are undertaken. Consequently, in the same way that the Board includes environmental performance in appraising overall company performance, top management also includes environmental performance in its appraisal system of different operational areas as well as that of respective Area Managers.

In order to ensure operational controls for those activities that may have negative environmental impacts, an environmental manual and a booklet on general environmental guidelines have been compiled. They are both "designed to integrate environmental awareness, values and actions into operational activities" (Hulett Aluminium, 1999a: 8). In essence, this is an effort to promote responsible work attitudes and behaviour towards those operational areas that pose environmental threats. The idea is that once the procedures are clear and understood by everybody, the likelihood of deviations from expected performance is reduced. This in turn increases the chances of fulfilling the set environmental performance objectives since employees are encouraged and made aware of the operational expectations of the company (i.e. creating awareness about in-house environmental expectations). Moreover, Hulett Aluminium's EMS is based on ISO 14001 and there is a possibility that the certification might be sought in future (Tongaat-Hulett, 1998).

Furthermore, Hulett Aluminium has introduced environmental audits. These audits are one way through which periodic performance of different operational areas is assessed. Environmental audits, therefore, provide invaluable information needed on the overall environmental performance of the company. A related issue is the development of environmental performance indicators (Appendix 8). Some of these indicators will ultimately provide information on a range of issues, some of which have not been previously monitored. This will expand the scope of concerns or issues that are likely to be monitored. This should enable the making of informed decisions based on information generated from within the company based on assessment of the internal activities.

6.3 Mckinsey's 7-S Model Reconsidered

At this stage, it is wise to reiterate the point raised in chapter 3 that Mcknisey's *7-S model* makes intuitive sense and provides a framework for analysing and understanding the process of integration and change in organisational settings. Indeed, the model does make sense in a number of respects. However, as with any framework, Mckinsey's *7-S model* represents ideas, some of which are subject to questioning. Having applied Mckinsey's *7-S model* to the case of Hulett Aluminium, a critical analysis of the model becomes imperative in order to discern its value to fostering change and integration in organisations. First, consideration shall be given to the model's strengths before addressing its weakness and implications.

6.3.1 Strengths

A brief consideration of the ideas on which the model is premised may serve as a realistic departure point in considering the strengths of the model. Clearly, Mckinsey's *7-S model* seems to encourage perception of organisations from a structural point of view. The structural understanding rests on assumptions founded on systemic and functional thinking. Hence, an organisation is perceived as comprising interconnected parts. If an organisation is to survive, there must be a minimum amount of integration between its parts. There must also be some amount of mutual compatibility of the parts.

Hence from this type of analysis, the strength of the Mckinsey's *7-S model* is that it promotes the examination of the parts of an organisation, how procedures and practices are internalised and how they contribute to integration. To this end, the model can be said to be valuable in as

far as it encourages the use a conceptual framework that views an organisation as a total change system (i.e. a holistic approach to understanding organisations). More importantly, it is a theoretical and conceptual model on which change management strategies and concepts may be based. It represents a normative framework that may be used for diagnosis, planning, intervention and evaluation of organisational change and integration efforts.

6.3.2 Weaknesses

Not withstanding the above strengths of the model, it is possible to draw some areas of concern or weaknesses in as far as the application of the model is concerned. These weaknesses may be generated from two perspectives: the ideas/ philosophies on which it is founded and its lack of adequate attention on human aspects in organisations.

In regard to the philosophy on which the model is founded (i.e. structural, functional and systemic), there is little doubt like other models founded on these ideas, the focus tends to be on how social systems (organisations) are maintained. The danger is that the approach could encourage positive evaluation of the parts of the organisation. Predominant focus on functions of organisational elements may be problematic in that one could lose sight of the dysfunctions of the same elements. In addition, this emphasis could lead to a situation where some elements of an organisation may be regarded as not only beneficial but also indispensable. In this case, the common critique leveled at functionalist approaches to the effect that they have a built in conservative bias which supports *status quo* (Haralambos and Holborn, 1995) may apply in this regard. Such tendencies may work against the spirit of change and integration in organisations. Also, the model presupposes a heavy reliance on the skills of internal harmony of organisational elements. To reiterate Waterman's[9] (1987: 56) argument, the model's basic assumption is that "an organisation as a whole will be skilled at something to the degree to which the other six sibilants [organisational elements] support that skill." However, reality instructs us to be cognizant that cooperation in organisations should not be taken for granted, as there is a possibility of conflict arising from lack of shared values and interests.

[9] Richard Waterman was part of the group that coined the *7-S model* at Mckinsey Inc.

The model's predominant focus on organisational elements also means that it does not offer a total change management strategy as it leaves out one key factor: employees/ human beings. In essence, it can be argued that the model does not specifically cater for individual developmental aspects. Indeed the model stresses the issue of skills acquisition, but this is from a technical point of view and not a social and psychological understanding of the human being. As such, personal growth in this model can be said to be in the background. This is because the model in itself is not sufficiently linked to the concept of the 'self' to bring about change at individual level necessary to foster and sustain change in an organisation.

In other words, efforts to incorporate the human dimension, especially the recognition of the potential for employees as a critical component of the much-needed virtuous circle of reinforcing change initiatives would greatly enrich the model. In its present form, the model does help to understand of organisational elements, but it falls short of capturing human aspects as it pays attention to technical issues almost to the exclusion of human factors that also play a critical role when it comes to sustaining change.

6.3.3 Implications for future application of the model

The above critique has implications for the model's application. Many writers including Mayo (1945) and Maslow (1954) among others have argued that social and psychological factors can cause motivation. In recent times, Senge *et al.* (1999) have elaborated just how critical the human factor is to the process of change in organisations (i.e. the human factor as an integral part of the process of reinforcing the change process in organisations). There appears to be a consensus that social and psychological factors can serve to support change efforts if adequately brought on board in organisational change efforts. They can also serve to block such efforts in situations where they have not been considered. For example, Argyris (1964) underscores the dichotomy of individual and organisational needs. He is of the opinion that at the heart of organisational development is concern for vitalizing, energizing, actualizing, activating and renewing of organisations through technological and human resources. In short, the tendency to view organisations essentially as if they existed without people (thus leaving out psychological and social factors) highlights the need for revisions of

Mckinsey's *7-S model*. The model's utility and value risks being undermined so long as it continues focusing on technical issues and not adequately capturing the 'human factor'.

6.4 Testing the Proposition

As outlined earlier, this study's main focus was integration of an EMS into corporate management. To this end, Mckinsey's *7-S model* was deemed relevant, as different authors have identified it to be concerned with the enhancement of integration of organisational processes in mainstream management (Waterman, 1987 and Gilbert, 1993). It was on account of this understanding that the model was adopted to try and understand the integration of an EMS into corporate management (i.e. in this study). Hence, in chapter 1 (section 1.5), the study's proposition was stated as follows:

> *Mckinsey's 7-S model of business elements can be usefully applied to evaluate the integration of an EMS into corporate management.*

In addition to the concerns raised in the previous chapter, it is also clear that Mckinsey's *7-S model* places emphasis on internal organisational elements and processes. This limits the model's usefulness in situations where external factors are having an influence or are being considered. As argued earlier, organisations are not immune to societal pressures. This means that if synergy is expected at the level of organisation and society interaction, then Mckinsey's *7-S model* cannot adequately capture the externalities that need to be understood and taken into account. In conclusion, it cannot be overemphasised that although Mckinsey's *7-S model* can be usefully applied to understanding the integration of an EMS, it does not sufficiently bring on board the external factors which also have a bearing on how organisations function and perceive of themselves. In view of foregoing arguments and their implications, it can be argued that while Mckinsey's *7-S model* has some utility, especially in terms of fostering organisational elements' interaction, it cannot be adequately applied to understand EMS integration, especially in light of the need for consideration of 'human factors'. Attention now needs to be shifted to the two preconditions set out at the beginning the thesis (see section 1.5) as being critical to the performance of an EMS.

6.4.1 Pre-condition 1

The first precondition states that *adequate integration of an EMS into corporate management depends on top management's commitment to ensuring necessary policy and structural changes to corporate functions, and the meaningful involvement of employees at critical stages in the implementation process.* For analytical purposes, this precondition is accordingly broken down into the following components: top management commitment; organisational/structural changes and involvement of employees.

Top Management Commitment

The centrality of top management commitment to any management endeavour is widely recognised in literature and environmental management is not an exception. According to James and Stewart (1995), top management commitment is an indispensable requirement for success in all areas of environmental management. Top management's support facilitates the adoption of an environmental policy, and its subsequent translation into responsibility and action (Netherwood, 1996). It is pertinent to reiterate the point raised in chapter 1 to the effect that top management's commitment permits time, financial and other resources to be availed to the environmental management process. Such support is clearly desirable as it helps to propagate interest amongst the general staff and it demonstrates top management's commitment thereby reducing possibilities for opposition.

At Hulett Aluminium, top management's commitment has been exhibited in several ways. First, was the acknowledgement that the performance of the company, in all aspects (including environmental management) is the responsibility of top management. Second, an environmental policy has been established, setting guidelines on the direction top management wishes to see the company going in regard to environmental management. The appointment of a senior management representative (see organogram in Figure 5.2) is another highlight, just as is the appointment of the Environmental Manager.

From a strategic position, the company has demonstrated its commitment by investing in capital equipment that is in line with operational levels expected of environmentally friendly processes, e.g. the remelt facility. In addition, there are clear lines of responsibility for environmental improvement spread across the organisation, with top and middle

management regularly meeting to assess progress. These highlights, among others, support the argument of top management's importance to environmental management, but it is also to be emphasised that commitment is needed at all levels of an organisation. The position that has been assumed by top management in regard of environmental protection may be inferred from this statement by the Managing Director:

> *"We endeavour to be proactive in our environmental efforts. Senior management has to show more passion for environmental management and clearly put it to the rest of the company that this is what we want to achieve, and there is no second opinion for the company in doing this because it is what we want to do, it is right and it has to be done."*

Involvement of Employees

Environmental management requires meaningful participation and involvement of all people in the organisation. This is one way of ensuring that each person takes responsibility of what his/ her job could do to degrade or improve the environment. Through participation, environmental management is likely not to be seen as an additional responsibility, but as part and parcel of the bundle of expectations of one's job or functional responsibilities. Moreover, some elements of an EMS require that they be done on the job, e.g. recording of certain forms of data that can then be collated for an organisation's environmental management information system. The recognition of participation at Hulett Aluminium may be discerned from one of Directors when he said:

> *"We cannot do this as a one-man management team, a handful of directors and Area Managers. We can only do it if we change a critical mass of the whole organisation, all the people need to work with absolute clear interest in the environment to make this company continuously improve on its environmental performance, which means we have to take all the employees on the journey, failure to which we cannot expect positive change. This requires a dramatic change in attitudes at all levels, and training and communication stand out as absolute necessities, hence the company's desire to make in-roads in these aspects. Moreover, the company is very dependent on the skills and attitudes of the people in all aspects, including the quest to protect the environment."*

The involvement process implies participation in different ways at different levels. This includes consultation on planning, setting objectives, targets and indicators as well as participation in data collection, auditing and operational routine activities. Operational routine activities include waste separation, incidence reporting, and documenting, reporting and general compliance with environmental guidelines. Awareness and participation of employees is being promoted through a training process, which should enable an understanding of issues concerned and their responsibilities, as Roome (1992: 15) suggests: "the improvement of managerial systems needs to recognise the value of building the belief

and commitment of the workforce to an environmental policy." If a company suffers from a shortage of adequate awareness levels, it is likely that inappropriate attitudes could hamper environmental management efforts.

As Welford (1993) has observed, no environmental improvement strategy can work without the full cooperation of the workforce that it affects. This poses a greater challenge for management to have a training programme to cater for the different categories of workers. As this study has shown, Hulett Aluminium is just on the threshold of implementing its company-wide training programme to cater for different categories of employees. It is anticipated that employees will apply the awareness acquired to their jobs. At Hulett Aluminium, supervisors are encouraged for example, to use the environmental manual as a basis for formal and informal training tool Box talks, focused training sessions, discussion groups, brainstorming of ideas and problems (Hulett Aluminium, 1999b). A majority of all the above issues pertaining to participation have been covered in chapter 6.

Organisational/ Structural and Process Changes

The theoretical literature has demonstrated that environmental management at times entails some changes to the existing structure of the organisation. While this is not an absolute requirement, it sometimes becomes necessary that some changes be introduced by way of new appointments or alterations in terms of reporting requirements, roles, responsibilities and documentation. In such scenarios, the implications of such changes need to be carefully handled.

In this connection, one of the features that characterised Hulett Aluminium previously was the absence of a cadre of workers to closely work with shop-floor workers and other departmental staff on environmental issues. The selection and subsequent training of AERs seems to be in recognition of the vital role that they can play in filling this gap.

Also, Hulett Aluminium has demonstrated that environmental management does not necessarily need a separate department with its own personnel. The theoretical literature on EMS suggests that if integration is to be effective, there does not necessarily need to be a separate department with its own personnel to perform the environmental tasks. In the case of Hulett Aluminium, what is happening is in line with the argument that whenever possible, an

EMS should be integrated into other business management functions (Sasseville *et al.* 1997). This not only creates more efficient overall management, but ensures that environmental performance becomes part of day-to-day organisational practices at different levels. Hulett Aluminium has demonstrated this by making environmental performance a component of its overall manufacturing business strategy (Hulett Aluminium, 1999c).

Part of the argument against using a separate department for environmental management is the potential for complacency and possibility for friction. A separate department may also be seen by others as a 'policing unit' existing to find faults thereby compromising the level of cooperation granted to such a unit. As Netherwood (1996: 109) contends, too often staff will deny responsibility for environmental issues, or 'pass the buck'. In short, a separate department poses the risk to limit the environmental responsibilities to only a few people thereby over-loading them.

Moreover, it is a known fact that sources of environmental concerns are varied, and unless everybody takes responsibility to control them, then the problems are likely to persist. According to Gilbert (1993) the ultimate aim should be the integration of environmental responsibilities into job descriptions and performance measurement. Hulett Aluminium's approach has made environmental management related to operational activities a departmental competency, but supported by an expert (Environmental Manager) for specialist knowledge and coordination purposes. Top management is responsible for strategic environmental management efforts.

6.4.2 Pre-condition 2

The second precondition states that *successful implementation of an EMS is affected by the availability of adequate financial and other physical resources (as well as attitudes to the allocation of such resources).* Gilbert (1993) has noted that lack of resources is one of the most frequently heard reasons for inaction regarding environmental management. However, it is generally acknowledged that although financial and other physical resources are not a prerequisite for successful implementation of an EMS, they are needed especially as environmental management efforts become more developed and complicated (Gilbert, 1993). For example, acquiring clean technology, support to training, technological innovations and other measures aimed at ensuring environmental sustainability comes at a cost to

organisations (Morrison *et al.* 2000). This problem has been noted as a potential hindrance to companies in the developing world from implementing environmental management strategies (UNCTAD, 1996).

The above precondition is supported by Hulett Aluminium's experiences. The appointment of an Environmental Manager, support to training of AERs and effecting of some corrective action requirements arising out of site audits have added to the company's costs on environmental management. From a strategic point, Hulett Aluminium has upgraded some of its old equipment and procured equipment that is environmentally safe to operate. In excess of R50 million was spent on reducing waste and emissions, water consumption, recovery equipment and energy conservation in the recently completed expansion project at Hulett Aluminium (Hulett Aluminium, 2000b: 8). Examples include the remelt which is being used to recycle scrap aluminium from the company's production lines as well as the market and the fume control incineration unit which purifies vaporous waste while permitting for the recovery of valuable energy (Hulett Aluminium, 2000b).

In short, this is a demonstration that although there are some things that can be ensured to minimise impact on the environment at minimal or no cost, other initiatives absolutely need substantial amounts of money, especially if it involves capital equipment. Where resources are not adequate, exacerbated by little or no commitment by top management, environmental management may be a lower priority when resources are allocated in a company (Roome, 1996).

6.5 Concluding Remarks

This chapter has examined the efficacy and value of Mckinsey's *7-S model* vis-à-vis EMS integration in organisations. It has also provided a critique of the model, highlighting its weaknesses, strengths and implications for future use. Overall, the model is useful to understanding EMS integration in as far as providing a framework for analysis is concerned. However, it has an inherent weakness arising from the ideas on which it is founded. The ideas on which the model is based tend to prescribe a functionalist/ structural conception of organisations. An understanding of the organisation from this perspective has a serious limitation because it attempts to look at organisations as if they exist without people.

Chapter 7
CONCLUSIONS

7.1 Introduction

The purpose of this chapter is to conclude the study. The chapter comprises four sections addressing the following: lessons, general observations, recommendations and lastly suggestions for further research.

7.2 Lessons

This study has provided a number of lessons on the complexity of internalising an EMS. These lessons are disaggregated into two: academic and practical. They are presented below in turn.

7.2.1 Academic lessons

Academic lessons relate to what has been learned from the study by way of concepts and principles. They relate more to the study framework. As such, a brief comment on each of the three main concepts of the study (change, integration, and EMS) is necessary. Furthermore, the study has throughout argued for the necessity of personal results in the process of organisational change. A brief comment on this (personal results) is made as well.

Change

This study has demonstrated that societal processes have compelling influences on organisational processes. To this end, it is necessary to examine the environment (bio-physical and otherwise), as it is responsible for the pressures that organisations have to contend with on a continuous basis. Thus, frameworks to understand organisational change should enable the examination of the environment, which according to Clarke (1994) creates the reason why change is inevitable and unavoidable in organisations.

Integration

As well as working towards being in alignment with the external environment (i.e. adapting), organisations need to undergo a process of internal transformation (structural, cultural and functional). This process is essential for the promotion of the much-needed synergy among the different organisational components and processes. The concept of integration is based on the understanding that a change, in for example, structure will have implications for the other aspects within the organisation. The question of 'fit' is of essence (Clarke, 1994; and Waterman, 1987). However, integration has many implications because it raises the necessity for an organisation to develop supportive capacities from different perspectives including human resource, operational, policy and strategic angles. Responses from the above-mentioned unleash opportunities that could serve to reinforce the integration process on an on-going basis. EMS integration is facilitated in an environment where decision-making and operational activities have environmental considerations as an intrinsic part.

Environmental Management System (EMS)

The study has demonstrated that an EMS cannot survive in isolation from other management systems and organisational processes. It needs to be fitted within the broad organisational settings so that it can contribute to the overall attainment of organisational objectives, while at the same time facilitating the achievement of environmental goals.

Personal Results

An important issue that has come out from the study is Mckinsey's *7-S mode's* inclination to technical issues, almost to the exclusion of human considerations. The model puts emphasis on skills (training) but this is not enough for purposes of engendering sustained change. There is need to motivate for personal results so that employees may get more committed to better ways of doing their work. However, this can only happen if employees believe that the organisation's future depends on successful execution of the change effort (e.g. an EMS). This, in turn, makes possible the perception of set targets and objectives as exciting, worthwhile and essential to their personal satisfaction, as well as to the prosperity of the company. In short, the current approach of the model that facilitates business results without a sufficient backing of personal results is a risk to change efforts because there is more or less no amalgamation of organisational and personal ideals. It is increasingly becoming clear

that social and psychological factors are a necessary lever to pull in order to sustain change. Change efforts that do not receive adequate support at the human level are likely to be short-lived because there will be no personal results with which the people can identify with (Senge *et al.* 1999). At the same time, such efforts might not lead to more people being involved and becoming aware of the change efforts because interaction tends to be limited to technical issues.

7.2.2 Practical lessons and observations

This study has provided a few practical lessons and observations as outlined below.

- An EMS is by its very nature iterative. Although the EMS phases overlap and interact, sequence does matter. For example, a clear policy position needs to precede most of the EMS activities and it helps to legitmise the EMS efforts thereby giving it some impetus. Therefore, an EMS needs to be strongly supported by inquiry and reflection efforts by all concerned to keep identifying root causes to detected problems.

- Top-down direction setting is necessary to create conditions for performance improvement. However, top-down efforts alone are not sufficient to bring about the desired changes. As such, top-bottom efforts need to be supported by broad-based bottom-up performance efforts to get people at all levels to adopt a new approach to solving problems and improving environmental performance of an organisation.

- Some form of 'organisation' needs to be established in order to spearhead change efforts. In this case, Hulett Aluminium's Area Environmental Representative (AERs), commonly known as 'Eco-Warriors' serve as a core team to champion environmental management. This initiative has provided a forum for objective discussions of progress and lessons learned. In a way, this reaffirms the saying that 'teams are the key building blocks' for organisational change. Equally important, Hulett Aluminium has designated a Director as responsible for overall EMS performance, as well as the Environmental Manger who works closely with the AERs.

- On-going initiatives to build awareness and capability in support of the process require intensive communication efforts, training sessions and management forums for sharing expertise and practices in implementing environmental management initiatives.
- Although not explicitly brought out as such, the case study somehow demonstrated the importance of personal results and self-motivation in regard to the identification and selection of AERs. Part of the criteria for selection was the motivation and commitment to better ways of doing things. In this way, highly motivated themselves, AERs are anticipated to create energy, and momentum in the people around them. In essence, this serves yet to underscore the importance recognising the special position of employees in organisational change efforts.

Old Lessons (Reaffirmed)

- Environmental management integration is not an easy endeavour even where commitment by top management and an environmental policy exists. Encouragement, motivation and persuasion have to be in place in order to bring everybody on board. Also, commitment of resources (time, money, personnel, etc.) is a crucial factor.
- Implementing environmental management is not a one-off activity. The challenge is to make it acceptable to many people, some of whom have negative attitudes about it. There is a definite need to spark interest in the many non-environmental employees in an organisation. Also, the principle of instrumentalism applies. As the Environmental Manager put it:

  "We have to start with manageable things so that everybody can see progress, and then build on this over time and maintaining momentum."

- Addressing a number of initiatives concurrently can help to foster environmental management. For example, the Hulett Aluminium's situation shows that strategic and operational imperatives are being pursued concurrently. In practical terms, this means that emphasis needs to be placed in different places depending on the nature of the problem at hand. For example, where the issue concerns strategic focus, the main action will be the Board and top management; where it is frontline involvement, it will be an issue for the attention of operational areas. For example, while recognising

that environmental management should be a key operational issue, from a strategic position, the company has procured equipment that will help to improve its overall environmental performance, and has modified some of its processes to reduce energy and water consumption.

- There are varying approaches to reporting environmental performance. In the case of Hulett Aluminium, there is some scepticism about glossy environmental reports as a means of communicating environmental performance externally. While recognising their value, Hulett Aluminium's priority seems to be internal reporting as well as an inclination towards audience specific mechanisms (talks, presentations) with interested and affected parties. Apparently, this trend (direct interphasing with external parties) is reportedly to be on the increase in many companies (Bennet and James 1998). Hulett Aluminium's approach to reporting, it seems, is that of interacting with identified interested and affected parties.

- Although sales-related drivers were acknowledged, they are not always the leading factor for environmental management initiatives. In this study, top management made it explicit that market or sales related considerations cannot be denied, but they are not a leading driver for environmental management initiatives.

- Literature recognises that there is an excessive focus on sites as the appropriate boundaries for measurement of environmental impact (Benet and James, 1998). The experiences at Hulett Aluminium seem to support this claim, especially that environmental audits seem to be site specific.

- Environmental management requires constant communication with all the staff. It needs communicating with and motivating the people who must ensure that the right practices are in place to safeguard the environment. As one Area Manager explained:

  "You must meet in person with the employees. Explain the purpose and rationale - and generally motivate them."

- Hulett Aluminium's experience with environmental management reveals one fundamental aspect: an inclination towards production areas as the major potential causes of environmental problems. Organisations are encouraged to begin with those areas in which they are potentially capable of harming the environment (Spedding,

1993). In the case of Hulett Aluminium, as a manufacturing company production is probably the area in which more efforts are needed compared to other areas.

7.3 Recommendations

In view of the findings of the study and its implications, it is recommended that:

- Deliberate efforts should be put in place to understand why the use of the environmental manual is low and to encourage wide use of the manual among employees.

- An environmental excellency competition among manufacturing area teams should be considered. Such a competition would contribute to raising environmental awareness. It was also clear during the study that most of the respondents had very little information about activities in other departments. The proposed competition would generate interest in finding out what other departments were doing. Within departments, similar competitions should be promoted among the different machine centres. Most of the respondents spoke against financial incentives or rewards, but they very much felt that a form of recognition needs to be shown.

- Publications such as *Aluminate* (and other occasional documents), should be made available to the local public library and the University library in order to encourage wider readership on Hulett Aluminium's activities. With regard to the environment, this is even more compelling since Hulett Aluminium does not produce a stand-alone environmental report.

- More attention is needed in regard to holding of meetings for Area Environmental Representatives. The situation that was reported during the study was sending a wrong signal on the importance attached to environmental management. This is especially because meetings for Area Environmental Representatives are an explicit requirement in the roles and responsibilities of Hulett Aluminium's EMS.

- Area Managers should be encouraged to report on initiatives started by departments on their own. For example, one department was engaged in rehabilitating soil on an

area that was contaminated using bio-remediation measures. However, the Area Manager was not sure whether or not the activity was going to be reported on.

- The perceived bias towards safety and health when it comes to reporting needs further scrutiny so as to promote reporting on environmental performance as well.

- The concept of personal results as well as their appreciation in group situations should be promoted. This, to some extent is being experimented with AERs, but there is a definite need to spread it among the different categories of employees. Hence, the concept of personal results might need to be seriously considered in light of individual dynamics and inter-personal relationships of the employees. This recommendation is premised on this study's argument that any proposal for active change (as suggested in an EMS) should provide cognisance of the human resource as the most critical factor that will both assist and hinder the proposed change.

7.4. Further Research

It is the researcher's considered view that technical considerations are vital for fostering environmental management. However, the human dimension is equally critical. As such, further research should endeavour to promote the people side of environmental management, taking such aspects as rewarding/ incentives, personal and organisational learning, organisational culture and behavioural patterns in organisations among other things into account. This is the real challenge that needs to be confronted in future research.

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Appendix 1

Questionnaire

Identification

Name of respondent:..... Department:.....

Designation:..... Contact:.....

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1. KNOWLEDGE, ATTITUDES AND PRACTICES

1.1 How vital is Environmental Management to your department?
a. ***Department :*** Very vital ( ) Vital ( ) Not vital ( ) Do not know ( )

Comment:.....

b. ***Company:*** Very vital ( ) Vital ( ) Not vital ( ) Do not know ( )

Comment: .....

1.3 Does your department presently implement any environmental management activities/ programmes?
Yes ( ) No ( ) *If **No,** why (briefly elaborate & go to **1.7**) and if **Yes**, give examples and briefly explain the nature and scope of these activities / programmes.*

.....

.....

1.4 Which environmental management activities stated above do you consider most successful?

.....
Why do you consider them most successful?

.....

1.5 Do you consider your department's present approach(es) to environmental management adequate to mitigating impacts?
Very adequate ( ) Adequate ( ) Less adequate ( ) Inadequate ( )

1.6 Do you feel that time allocated to environmental management in your department is (*tick one*):
Too much ( ) Sufficient ( ) Too little ( ) None at all ( )

1.7 Do you know of the voluntary environmental management standard(s) being implemented in companies nationally and internationally?
Yes ( ) No ( ) *If **Yes**, mention **at least one (1)** :*.....

1.8 Do you participate in any environmental management activities, either in your department or at another level within the company?
Yes ( ) No ( ) *If **Yes**, elaborate:*

.....

1.9 In your opinion, to what extent is environmental policy vital to achieving environmental goals?

Very necessary ( ) Necessary ( ) Not necessary ( ) Don't know/not sure ( )

Comment: .....

1.10 What reasons/ motives are significant in your opinion for the importance attached to environmental protection in your company today?

.....

2. PLANNING

2.1 Environmental Aspects *(Environmental aspects: "any elements of a company's activities, products or services that could interact with the environment, in either a positive or negative way, e.g. emissions, noise, energy use," etc.* Sasseville, 1996*)*

2.1.1 Does your department undertake planning activities aimed at addressing environmental management?
Yes ( ) No ( ) *If **No** why;* but *if **Yes**, briefly describe the planning process*

.....

.....

2.1.2 How would you rate the planning process relating to environmental protection in your department?
Good ( ) Promising ( ) Improving ( ) Poor ( )

2.1.2 How would you describe the extent to which personnel from other departments participate in environmental management planning?
Very well ( ) Well ( ) Poorly ( ) None at all ( ) *If poor or none at all, skip 2.1.3*

2.1.3 Are there any difficulties encountered in using an interdepartmental approach to planning for environmental management? Yes ( ) No ( ) *If **Yes**, explain how such tensions were resolved* (probe for an example).

.....

.....

2.1.4 In your opinion, have environmental aspects in your department been adequately identified?
Very adequate ( ) Adequate ( ) Poor ( ) Not at all ( )
Probe the response for a brief explanation for Very adequate & adequate; & WHY if poor or none at all

.....

.....

2.1.5 What are the foremost environmental aspects that your department should manage?

.....

.....

Probe the aspects which the department is actually managing at present (seek examples).

.....

.....

2.1.6 What measures are there to ensure that the potential environmental concerns associated with the identified job functions are mitigated, minimized or brought under control?

.....

.....

2.2 Legal and other requirements

2.2.1 Has your department taken into account legal and regulatory requirements in its environmental planning process? Yes ( ) No ( ) *If **Yes**, probe for examples*

Legal requirements	Reference	Response	
		Spontaneous	*Probe*
The Constitution	Act 108 of 1996		
Occupational Health Act	Act 85 of 1993		
National Environmental Management Act (NEMA)	Act 10 of 1998		
National Water Act	Act 36 of 1998		
Atmospheric pollution Prevention Act	Act 35 of 1965		
Water Services Act	Act 108 of 1997		
Others:			

2.2.2 Are there any limitations to your incorporation of legal requirements in your environmental management process? Yes ( ) No ( ) No opinion ( )
*If **Yes**, briefly elaborate how you dealt with (or hope to deal with) these limitations.*
.....
.....

2.2.3 How would you rate the incorporation of legal requirements into your department's activities?
Very sufficient ( ) Sufficient ( ) Not sufficient ( ) No opinion ( )

2.2.3 Besides the statutory requirements, are there any requirements that your department has taken into account in planning for environmental management?
Yes ( ) No ( ) *In either case, probe (for examples if **Yes**, & WHY if **No**)*
.....
.....

2.3 Objectives and targets

2.3.1 Has your department set documented environmental objectives and targets?
Yes ( ) No ( ) *If **No**, go to **Q. 2.3.8***
*a. If **Yes**, what are your department's stated environmental objectives?*
.....
.....

b. Broadly, which environmental concerns are generally covered in the departmental initiatives?

Target Areas	Spontaneous	Prompted		Target Areas	Spontaneous	Prompted
Solid waste disposal				Water consumption		
Air emissions				Packaging		
Health and safety				Environmental education		
Energy consumption				Product impacts		
Material consumption				Water effluents		
Other (specify):						

2.3.2 What factors were considered in developing measures to ensure conformity with the company environmental objectives?

Factors/ Concerns	Spontaneous	Prompted
Significant environmental aspects		
Technological options		
Financial, practical and business necessities		
Views of interested and affected parties		
Views of employees		

2.3.3 Who set the objectives and targets? (*Indicate more than one if necessary*)
Departmental Manager or his/ her office ( ) Officers' working group ( )
Environmental forum ( ) Environmental committee ( )
Other - please specify: .....

2.3.4 Is there any significant result in having set environmental objectives and targets? Yes ( ) No ( )
*If **Yes**, give examples:*
.....

2.3.5 Which of the following statements would you deem most applicable to your department's situation? (*Indicate more than one if necessary*
Formal objectives are always set ( ) Formal objectives are set when deemed necessary ( )
Informal objectives are usually set ( ) Objectives are never set ( )

2.3.6 What factors have helped you to achieve the environmental objectives and targets?

.....

.....

2.3.7 What are the main impediments to planning for environmental management (i.e. including legal & other requirements, objectives & targets) purposes in your department? *(probe for an explanation).*

.....

2.3.8 How urgent is it is it to address these impeding factors?
Very urgent ( ) Urgent ( ) Not urgent ( ) Do not know ( )

*If **very urgent** or **urgent**, briefly describe the process is to be followed..*

.....

.....

2.3.9 Has there ever been a situation where your objectives were seen to be at variance with those of another department? Yes ( ) No ( ) *If **Yes**, to what would you attribute the situation?*

.....

.....

2.3.10 How was the matter finally resolved?

.....

2.3.11 Of the following activities related environmental management planning, rank the one you think your department has recorded the most progress as 1 and continue to the one you think has recorded least progress (4). If you think there is a tie on some aspects, give them the same rank.

Activities	**Rank**
Identification environmental aspects with potential to harm the environment	
Setting objectives and targets	
Identification of legal and other requirements	
Establishing relevant management programmes to meet the environmental objectives and targets	

3. IMPLEMENTATION AND OPERATION

3.1 Structure, responsibility & resources

3.1.1 Is there a departmental representative who has been charged with the responsibility to ensure that environmental programmes are established, implemented and maintained and to provide reports to top management? Yes ( ) No ( ) *If **Yes**, briefly explain the nature of this arrangement.*

.....

.....

3.1.2 In your considered view, are the financial resources that are directed to environmental programmes adequate?
Very adequate ( ) Adequate ( ) Poor ( ) None at all ( ) *If **none at all**, skip **3.1.3***
If very adequate or adequate, briefly explain how funds are allocated and motivated

.....

.....

3.1.3 Has the budget for Environmental management changed since it was introduced?
Major increase ( ) Slight increase ( ) No change ( ) Slight decrease ( ) No opinion ( )

3.1.4 If the answer to 3.1.2 is *poor* or *none at all*, how would you explain the inadequate support.

.....

3.2 Training, awareness and competence

3.2.1 Are there any training activities pertaining to environmental management provided to staff in your department? Yes ( ) No ( ) *If No, go to 3.3;* *If Yes,* briefly explain the nature of training provided.

.....

.....

3.2.2 Has there been training session in the last 24 months in environmental management in which staff from your department have participated (as trainees)? Yes ( ) No ( )

3.2.3 Probe on each of the following and record accordingly.

Statements	Very true	True	Not true
Specific training sessions are conducted as and when necessary			
Training is provided on identified environmental management themes pertinent to the department.			
Training is broad to cover general environmental concerns of the company			
Training is part of the routine safety and health strategy of the department/ company			
Only those in positions identified as requiring training are trained.			
All departmental employees have to undergo training in environmental management			

3.2.4 Who conducts the training and how often?

.....

.....

3.2.5 How does the training programme cater for new employees?

.....

.....

3.3 Communication

3.3.1 Does your department carry out any information, education and communication initiative(s) about environmental management? Yes ( ) No ( ) *If No, go to 3.3.3*

3.3.2 How would you rate the communication efforts regarding environmental management in your department?
Good ( ) Promising ( ) Improving ( ) Poor ( )

3.3.3 What are the major themes addressed under your communication efforts?

.....

3.3.4 How would you rate communication relating to environmental management in your department at present?
Very effective ( ) Effective ( ) Less effective ( ) Not effective ( )

3.3.5 How has environmental management information been disseminated within your department?
Staff bulletin/ newsletter ( ) Special information sheets ( )
Departmental committee ( ) Informally ( )
Other (specify):.....

3.3.6 How would you assess the contribution of information dissemination initiative(s) has made to raising environmental awareness within the department?

Significant increase ( ) Slight increase ( )
No change ( ) No assessment possible/ Don't know ( )

3.3.7 Can you identify some areas of difficulty to communication?

.....

3.4 Environmental Management Documentation & Reporting

3.4.1 Does your department keep environmental management documentation?
Yes ( ) No ( ) *If No, go to Q. 3.4.3*

3.4.2 How current/ up-to-date is your department's environmental documentation?
Very current ( ) Current ( ) Moderately current ( ) Not current ( )

3.4.3 Which of the following statements closely matches the present situation of your department's environmental management documentation?

Statements	True	False
Reports are prepared after an incidence		
Routine stand-alone environmental management reports are prepared		
Reports are only as and when it is necessary (or when requested)		
Reports are an integral part of the department's routine reporting on progress		

Comment: .....

3.4.4 Can you identify some area(s) of difficulty to environmental management documentation?
.....

3.4.5 Which of the following terms best describes the process of environmental reporting?

Highly participatory ( ) Participatory ( ) Consultative ( ) Not involved ( )

3.4.6 What factors (if any) stand in the way of your department's quest to report on environmental performance?

.....

3.4.7 Are there any benefits in reporting on environmental performance that have accrued to your department so far? Yes ( ) No ( ) *If Yes, briefly elaborate.*

.....

3.5 Operational Control

3.5.1 Does your department have a system of environmental management operational control?
Yes ( ) No ( ) *If No, go to sub-section 3.6*
If Yes, give examples.

.....

3.5.2 How effective do you regard your department's operational controls?
Very effective ( ) Effective ( ) Moderately effective ( ) Not effective ( )

3.5.3 Are you aware if there is an environmental manual in your company? Yes ( ) No ( )

3.5.4 How would you describe the extent to which the environmental manual is being used in your department?
Highly used ( ) Averagely used ( ) Not used ( ) Not sure ( )

Comment: .....

3.5.6 Do operational measures in your department face any major problems?
Yes ( ) No ( ) *If Yes, briefly explain:*

.....

.....

3.6 Emergency preparedness and response

3.6.1 Has your department got emergency preparedness and response measures in place?

Yes ( ) No ( ) *If No, go to **Q. 3.6.3***

3.6.2 How sufficient are your department's emergency preparedness and response measures?
Very sufficient ( ) Sufficient ( ) Less sufficient ( ) Not sufficient ( )

3.6.3 Briefly describe the main difficulties experienced relating to emergency response and preparedness?

.....

.....

3.6.4 Of the following activities related implementation and operation of an environmental management strategy, rank the one you think your department has recorded the most progress as 1 and continue to the one you think has recorded least progress (6). If you think there is a tie on some aspects, give them the same rank.

Activities	Rank
Structure and responsibility distribution among staff	
Training, awareness and competency creation among staff	
Operational control	
Emergency preparedness and response	
Departmental environmental management documentation	
Departmental communication on environmental issues	

3.6.5 What would you regard as the main obstacles to implementation and operation of your department's environmental management initiatives? *(Probe on perceived reasons)*

.....

4. CHECKING & CORRECTIVE ACTION

4.1. Environmental Management Audits

4.1.1 Has an environmental audit ever been conducted in your department?
Yes ( ) No ( ) *If No go to **sub-section 4.2***

4.1.2 What were the stated objectives of the audit?

.....

.....

4.1.3 Briefly describe the process for setting objectives for the audit?

.....

4.1.4 Were outside consultants (i.e. external to the company) employed at any stage of the audit?
Yes ( ) No ( ) *If No, go to 4.1.5*

*If **Yes**, at what stage were the outside consultants were brought in?*

To help set the aims and scope of the audit ( ) To undertake the audit ( )
To assist internal staff in conducting the audit ( ) Other (specify) .....

4.1.5 What publications have resulted, or will result from the audit?

.....

4.1.6 Were recommendations for action part of the audit?
Yes ( ) No ( ) *If No, go to **sub-section 4.2;*** *If **Yes**, were these recommendations:*
Costed ( ) Prioritized ( ) Delegated to specific staff ( )

Comment:.....

4.1.7 What do you regard to be most vital action(s) that have taken, place as a result of the audit in your department (if any)?

4.2 Management review

4.2.1 Are you aware of any measures that have been effected by Management as a result of a review of the environmental management approach regarding your department?
Yes ( ) No ( ) *If **Yes**, give an example.*
.....

4.2.2 Of the following activities related checking and ensuring that corrective action is taken concerning an environmental management strategy, rank the one you think your department has recorded the most progress as 1 and continue to the one you think has recorded least progress (5). If you think there is a tie on some aspects, give them the same rank.

Activities	Rank
Monitoring and measurement	
Non-conformance, preventive and corrective action	
Record keeping	
Environmental management t audits and reports	
Departmental management review	

5. GENERAL CONSIDERATIONS

5.1 Would you say that long-established procedures, practices and belief systems in the company have
i. Faciltated change within the department/ company ( )
ii. Opposed change in the department/ company ( )
Other (explain).....

If i or ii above, probe for examples
.....
.....

5.2 What are the 'top four' drivers and barriers to your company's environmental management approaches.

Drivers	Barriers
1.	1. .....
2.	2. .....
3.	3. .....
4.	4. .....

5.3 How would you rank your department to the other departments within the company in regard to environmental management?
Much better ( ) Slightly better ( ) The same ( ) Slightly worse ( ) Much worse ( )

5.4 What do you feel your department has **NOT** accomplished with regards to Environmental Management, and what do you attribute this to?
.....
.....

5.5 What are the main goals of implementing environmental management in your department?

.....

.....

5.6 To what extent do you find environmental performance integrated with your Department's performance requirements?

Very well ( ) Average ( ) Poorly ( ) No opinion ( )

Comment: .....

5.7 Are you aware of the criteria used to assess progress/ performance in each of the key performance areas?

Yes ( ) No ( ) *If **Yes**, briefly elaborate*

.....

.....

5.8 Are there any rewards/ incentives offered in recognition of good performance in environmental management? *If **Yes**, briefly explain/ give examples. Also probe on possibility of punishments directly relating to poor performance regarding environmental management*

.....

.....

5.9 What are your personal feelings about environmental management in your department in particular and the company in general, and what would you propose be done about this matter?

Department	**Company**
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

Thank you very much for helping with this research. Finally, I would be grateful to receive any documents (which are within the public domain) that your company/ department has produced relating to Environmental Management.

Nyambe Nyambe

Appendix 2

Open-ended Interview Guide

1. **Environmental Policy**
   - ⇒ General discussion

2. **Environmental Planning**
   - ⇒ Environmental aspects
   - ⇒ Legal and other requirements
   - ⇒ Objectives and targets
   - ⇒ Environmental management programmes

3. **Implementation and operation**
   - ⇒ Structure and responsibility
   - ⇒ Training, awareness and competence/ human resource development
   - ⇒ Communication
   - ⇒ EMS documentation
   - ⇒ Operational control
   - ⇒ Emergency preparedness and response
   - ⇒ Nonconformance and corrective and preventive action
   - ⇒ Records
   - ⇒ Environmental Management audits/ environmental performance

4. **Other areas of concern**
   - ⇒ Social performance
   - ⇒ Financial issues relating to environmental management
   - ⇒ Technological development
   - ⇒ General perspectives to environmental management
   - ⇒ Global competition and environmental pressure

Appendix 3

International Chamber of Commerce Business Charter for Sustainable Development

The Business Charter for Sustainable Development was prepared in 1990 for launching at the second World Industry Conference (WICEM II) in April 1991. It provides a basic framework of reference for action by individual corporations and business organizations throughout the world.

Corporate priority
To recognize environmental management as among the highest corporate priorities and as a key determinant of sustainable development; to establish policies, programmes and practices for conducting operations in an environmentally sound manner.

Integrated management
To integrate these policies, programmes and practices fully into each business as an essential element of management in all its functions.

Process of improvement
To continue to improve corporate policies, programmes and environmental performance, taking into account technical development, scientific understanding, consumer needs and community expectations, with legal regulations as a starting point; and to apply the same environmental criteria internationally.

Employee education
To educate, train and motivate employees to conduct their activities in an environmentally friendly manner.

Prior assessment
To assess environmental impacts before starting a new activity or project and before decommissioning a facility or leaving a site.

Products and services
To develop and provide products or services that have no undue environmental impact and are safe in their intended use, that are efficient in their consumption of energy and natural resources, and that can be recycled, reused or disposed of safely.

Customer advice
To advise, and where relevant educate customers, distributors and the public in the safe use, transportation, storage and disposal of products provided; and to apply similar considerations to the provision of services.

Facilities and operations
To develop, design and operate facilities and conduct activities taking into consideration the efficient use of energy and materials, the sustainable use of natural resources, the minimization of adverse environmental impact and waste generation, and the safe and responsible disposal of residual wastes.

Research

To conduct or support research on the environmental impacts of raw materials, products, processes, emissions and wastes associated with enterprise and on the means of minimizing such adverse impacts.

Precautionary approach
To modify the manufacture, marketing or use of products or services or the conduct of activities, consistent with scientific and technical understanding, to prevent serious or irreversible environmental degradation.

Contractors and suppliers
To promote the adoption of these principles by contractors acting on behalf of the enterprise, encouraging and, where appropriate, requiring improvements in their practices to make them consistent with those of the enterprise; and to encourage the wider adoption of these principles by suppliers.

Emergency preparedness
To develop and maintain, where significant hazards exist, emergency preparedness plans in conjunction with the emergency services, relevant authorities and the local community, recognizing potential transboundary impacts.

Transfer of technology
To contribute to the transfer of environmentally sound technology and management methods throughout the industrial and public sectors.

Contributing to the common effort
To contribute public policy and to business, governmental and intergovernmental programmes and educational initiatives that will enhance environmental awareness and protection.

Openness to concerns
To foster openness and dialogue with employees and the public, anticipating and responding to their concerns about the potential hazards and impacts of operations, products, wastes or services, including those of transboundary or global significance.

Compliance and reporting
To measure environmental performance; to conduct regular environmental audits and assessments of compliance with company requirements, legal requirements and these principles; and periodically to provide appropriate information to the Board of Directors, Shareholders, employees, authorities and the public.

Appendix

Chemical Industries Association Responsible Care Programme Principles

Members of the Chemical industries Association (CIA) are committed to managing the activities so that they present an acceptably high level of protection for the health and safety of employees, customers, the public and the environment.

The following Guiding Principles form the basis of this commitment:

- Companies should ensure that their health, safety and environment policy reflects commitment and is clearly seen seen to be an integral part of their overall business policy.

- Companies should ensure that management, employees at all levels, and those in contractual relationships with the Company are aware of their commitment and are involved in the achievement of their policy objectives.

- All company activities and operations must be conducted in accordance with relevant statutory obligations. In addition, Companies should operate according to the best practices of the industry and in accordance with Government and Association guidance.

In particular, Companies should:

- Assess the actual and potential impact of their activities and products on the health and safety of employees, customers, the public and the environment.

- Where appropriate, work closely with public and statutory bodies in the development and implementation of measures designed to achieve an acceptably high level of health, safety and environmental protection.

- Make available to employees, customers, the public and statutory bodies, relevant information about activities that affect health, safety and the environment.

- Members of the Association recognize that these Principles and activities should continue to be kept under regular review.

Appendix 5

South African responses to the environmental challenge

RESPONSE	AIM
1. International Agreements	
1.1. Convention on International Trade in Endangered Species or wild fauna and flora (CITES)	Protection of endangered species by regulating trade in live specimens or products
1.2. Convention on Biological Diversity	Promotion of the sustainable use of biological resources, regional co-operation, and sharing of benefits by local communities
1.3. United Nations Convention to Combat Desertification	Promotion of sustainable land use practices through research into causes of drought
1.4. Convention on Wetlands of International Significance especially as Waterfowl Habitat	Promotion of wetlands conservation
1.5. Framework Convention on Climate Change	To halt and reverse the trend in climate change through reduction of emissions of greenhouse gases
1.6 Protocol for the Protection of the Ozone Layer (Montreal Protocol)	To prevent further depletion of the Ozone layer by reducing emissions of CFCs
1.7. Convention on the Prevention of Pollution by Dumping of Wastes and Other Matter	To prevent dumping of waste from ships, and to minimise the risk of oil spills
2. National Policy	
2.1 The Constitution (Act 108 of 1996)	Gives all South Africans the right to a healthy environment, and the right to the protection of the environment.
2.2. National Environmental Management Act (NEMA) Act 10 of 1998	To prevent or minimise damage to the environment ,and to rehabilitate already degraded environments.
2.3. Draft National Coastal Management Policy (White Paper, 1998)	To promote the sustainable use of marine and coastal resources, to prevent or minimise damage to coastal and marine systems , and to prevent or reduce pollution and waste.
2.4. National Water Act (Act 36 of 1998)	To promote the sustainable use of waster resources, and to provide basic human needs and ecological requirements.
2.5. Draft policy on the Conservation and Sustainable Use of South Africa's Biological Diversity (White paper, 1998)	To promote the sustainable use of biological resources, and to support sharing of benefits by local communities.
3. Programmes and Strategies	
3.1. Spatial Development Initiatives	To coordinate and centralize development , minimizing fragmentation of habitats
3.2. Strategic Environmental Assessments, Environmental Impact Assessments and Environmental Management Plans	To ensure impacts of development or practices are understood, that environmental damage is minimized and that already damaged environments are rehabilitated.
3.3. Working for Water programme	To remove alien vegetation from catchment areas, thereby improving run-off and bio-diversity, and to create jobs.
3.4 Land care initiative, National Grazing Strategy, Stock Reduction Schemes, Responsible Care Programme	To promote sustainable production techniques, minimizing damage to soil and vegetation.
3.5. Standards and guidelines (e.g. for fresh water)	To regulate pollution and maintain high quality of resources.

Source: DEAT, 1999b

Appendix 6

Letter of introduction/ Fax message

Att: Mr. R. Stone; Hulett Aluminium; P.O. Box 74; Pietermaritzburg

Date: 17 August 2000

Fax: 033-3956766

Subject: Proposed Case Study of Hulett Aluminium's Environmental Management System

Dear Mr. Stone,

Nyambe Nyambe is currently completing his Masters in Environmental and Development at the University of Natal Pietermaritzburg's center for Environment and Development (CEAD) and has undertaken to research corporate environmental management systems (EMS). Your company has participated in the Masters programme by way of the talk you gave to students. In view of this, we seek your further collaboration in permitting Nyambe Nyambe to research EMS within your company.

As I'm sure you are aware, the last few years have seen a swelling interest in the benefits to accrue from corporate environmental management. Firms of all kinds are concerned to achieve and demonstrate sound environmental performance by controlling the impact of their activities, products and services on the environment, taking into account their environmental policy objectives. There is, however, a lot of research still to be done in order to improve procedures and to help in establishing models of good environmental management system in South Africa. The intention is to understand the complexity of internalizing environmental management system within the corporate sector. The study will, therefore focus on experiences rather than on company performance. We do not intend to evaluate Hulett Aluminium.

I hope you will assist in this research by enabling Nyambe Nyambe to identify and engage appropriate personnel by way of interviews and questionnaires.

I look forward to hearing from you.

Professor C. M. Breen
Supervisor

Appendix 7

Hulett Aluminium's Environmental Policy and Tongaat Hulett Group Environmental Statement

The protection of the environment is critical to the sustainable future of the world and its people.

We accept our responsibility towards the environment and are committed to achieving compatibility between the environment, the processes and the products of our operations.

In complying with all applicable laws, regulations and permits, we will protect the environment, the health of our employees and citizens of the communities in which we operate.

We aim to minimize waste, maximize recycling and seek to achieve the most efficient use of energy and raw materials.

We are committed to continual improvement in our environmental performance and, where appropriate, will undertake prior impact assessments in the expansion of our business.

Management will conduct periodic reviews of environmental performance, re-evaluate risks and initiate appropriate action.

We will cooperate with authorities and research organizations to establish responsible standards, legislation and regulations.

We will involve and train our employees for their effective participation in all related environmental activities.

By observing these principles, we will, through our leadership and exemplary behaviour, address environmental expectations of our stakeholders.

P. H. Staude
Managing Director

TONGAAT HULETT ENVIRONMENTAL STATEMENT

The Group is conscious of its responsibility towards the environment and is committed to continually improving its environmental performance through the judicious management of its operations to achieve optimum resource productivity. It has formally established an environmental policy embodying goals, principles, objectives and strategies in terms of which the Group's responsibility towards the environment will be managed and evaluated. The Group has recently become a member of the Industrial Environmental Forum (IEF) and fully subscribes to the ideals of this organization. The Group is committed to using the environmental self-assessment programme promoted by IEF as a bench-mark for monitoring its divisions and it is hoped in time they will meet the ISO 14000 standard, which is the new international code of practice for environmental management. In addition, it is committed to, and involvement in the Consultative National Environmental Policy Process at national, provincial and local levels and initiatives aimed at improving the environment and environmental performance.

Source: Tongaat Hulett Group, 1995.

Appendix 8

Hulett Aluminium's Environmental Performance Indicators

Measure	Basis	Enter data (if N/ A, reason)
1. M^3 water supplied by municipality	Full annual tonnage (all products)	
2. M^3 Hulgas	CD remelt tons cast & ingot tons preheated	
3. GJ electricity used 583796	Full annual tons (rolled products) 54692	
4. Tons HFO	Edendale remelt output (all products)	
5. Tons LPG	Coil coating line output	
6. Tons wood purchased for packaging	Full annual tons (rolled products)	
7. Tons paper purchased for packaging	Ditto	
8. Rand value for packaging materials	Ditto	
9. Litres of mineral rolling oil purchased	Full annual sheet & foil output	
10. Litres of hot rolling oil purchased	Full annual plate and hotline out	
11. Tons of Aluminium metal purchased	Full annual tons output (split RP & Extrus)	
12. Tons of alloying ingredients purchased	Ditto	
13. Tons of chlorine	Full annual tons output (all products)	
14. M^3 of effluent discharged 121387	Ditto (54692 + 11980 = 66672)	
15. M^3 of effluent discharged out of spec	Ditto	
16. Kgs of particulates discharged to air	Full annual remelt output (all products)	
17. Tons of CO_2 discharged to air	Full annual tons (all products)	
18. Tons of SO_2 discharged to air	Ditto	
19. Tons of VOCs discharged to air	Ditto	
20. Tons of discarded emulsion discharged	Ditto	
21. Tons of Aluminium Hydroxide discarded	Ditto	
22. Tons of lacquer used and discarded	Annual tons of lacquered products	
23. Tons of paint used and discarded	Annual tons of painted products	
24. Tons of dross produced	Annual tons of remelt output	
25. Tons of filter media purchased and discarded	Annual tons output (all products)	
26. Tons pre-treatment chemicals used	Annual foil output	
27. Tons of general waste dumped	Annual Alpaste output	
28. Tons of shredded foil discarded	Full annual output (all products) tons	
29. Tons of white spirits purchased and recovered	Annual Alpaste output	
30. Used plastic, cardboard and interleaving paper	Full annual output (all products) tons	
31. Waste paper recycled	Full annual output tons	
32. Waste timber discarded	Full annual output tons	
33. Discarded metals	Full annual output tons	
34. Litres of rolling oil recovered	Annual tons sheet and foil output split	
35. Packaging materials re-used (Rand saving)	Annual packaging costs	
36. Number of environmental incidents	Supported by investigation reports	
37. Kgs fluorescent tubes discarded	Kgs disposed	
38. No. of audits conducted (internal & external)	Numbers, dates and participants	
39. No. of environmental for a attended	Employees and names of fora	
40. No. of awards received (e.g. NOSA)	Description	
41. Total environmental operating expenditure	Actual (or verified & supported)	
42. Tons of Aluminium purchased for recycling	Tons	
43. Clean up costs for spills (internal & external)	Rand value	
44. Rand value of small businesses assisted	Rand value and descriptions	