A Model for Environmental and Health and Safety Regulation for the Mining and Upstream Petroleum Industries

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DECLARATION

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Michael Malavazos

31 August 1998

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ABSTRACT

This thesis reviewed the literature in order to:

- define a model for environmental and health and safety regulation applicable to the mining and upstream petroleum industries;

- explore the issues that need to be addressed in evaluating and comparing alternative regulatory approaches; and

- compare the current regulatory approaches in Australia, New Zealand and Canada for these industries.

Subsequently, a model, consisting of three main components is proposed. The first component provides for an open and transparent stakeholder consultation process in establishing the regulatory objectives. The second component offers a process for selecting the most appropriate regulatory strategy to achieve the objectives. It advocates selecting strategies on an individual company basis rather than by a one-size-fits-all approach. It involves a two-tiered process where the first tier attempts to rectify market failure through creating appropriate economic incentives for companies to voluntarily comply. Where this is not possible, the second tier seeks to select on the basis of company compliance culture, strategies which can effectively and efficiently control company behaviour. The third component provides for an effective enforcement strategy for ensuring compliance with the regulatory objectives.

Effectiveness and efficiency in meeting the regulatory objectives were identified as the key parameters in any undertaking of a cost-benefit analysis of regulatory strategies.

Evidence is presented that in Australia, New Zealand and Canada there is currently a change underway in the way the mining and upstream petroleum industries are being regulated. The main trend is away from traditional command-and-control regulation and towards performance-based and management-system based approaches. It is observed that this trend is paralleled with changes to a more proactive attitude and culture in these industries towards environmental and health and safety protection.

INTRODUCTION

Aim

The main aim of this thesis is to present, on the basis of a review of the literature, a model for environmental and health and safety regulation applicable to the mining and upstream petroleum industries. The latter industry relates to oil and gas exploration and production activities excluding refining and processing of oil and gas.

The model will serve as an introduction to an empirical three year research project into regulation of the upstream petroleum industry, which has been instigated by the Petroleum Group of the Department of Primary Industries and Resources South Australia (PIRSA: formerly the Petroleum Division of the Department of Mines and Energy Resources South Australia [MESA]). The project will be carried out in collaboration between PIRSA's Petroleum Group and the Flinders Institute of Public Policy and Management of the Flinders University of South Australia (FIPPM 1997). This project will be jointly funded by PIRSA and a grant under the Australian Research Council and Department of Employment, Education and Training Strategic Partnership with Industry Research and Training (SPIRT) program: hereinafter the project is referred to as the SPIRT project.

However, this thesis is independent of the SPIRT project and was prepared solely by the author as part of his Masters degree in Public Policy and Management in the Flinders Institute of Public Policy and Management at the Flinders University of South Australia.

Background

During the 1980s and 1990s there have been significant changes worldwide in the regulatory approaches adopted by governments to control the activities of companies. Such changes include reform in the area of economic regulation where government intervention in pricing, competition and market entry has been considerably lessened, often through deregulation (Head & McCoy 1991). The aim of this reform has been to

increase economic efficiency by facilitating "free market" economies. The other major reform has been in the area of social regulation relating to the protection of the so called "public interests" such as health and safety and the environment.

Unlike in the area of economic regulation, reform of social regulation has not been one of deregulation but more of re-regulation (Braithwaite 1991; Gow & Maher 1994). The aim has been to justify the need for social regulation in the first place (OECD 1996). Where such a need is justified, the aim has been to design the most flexible, efficient and effective regulatory strategy (OECD 1997a). Social regulation in the areas of environmental and health and safety protection in the mining and upstream petroleum industries operating in democratic countries is the focus of this thesis. However, the model presented here is also applicable to other industrial sectors in such countries.

The concern for the effectiveness and efficiency of government regulation has been voiced strongly by the Organisation for Economic Co-operation and Development ([OECD];OECD 1995a). The key recommendation of the OECD is that member countries take effective measures to ensure the quality and transparency of government regulations (OECD 1995b). To achieve this a series of questions in a reference checklist for regulatory decision-making (OECD 1995c) has been proposed. These questions examine the quality and performance of administrative and political processes for developing, implementing, evaluating and revising regulations. They raise issues pertaining to whether:

- the objectives of the regulation are clearly defined and understood;
- government action can be justified — what are the alternatives to achieving the objectives other than direct government intervention; and
- the regulations are developed in an open and transparent fashion which reflect the interests of all stakeholders.

Following this recommendation, the OECD released a report on regulatory reform outlining two years of research and analysis carried out on the experiences and

challenges faced by member countries in the regulatory reform process (OECD 1997a). The report stated:

> A central function of any democratic government is to promote the economic and social well-being of its people. Governments seek to meet that objective in a wide variety of ways, including through policies aimed at macroeconomic stability, increased employment, improved education and training, equality of opportunity ... and high standards of environmental quality, health and safety. Regulation is an important tool that has helped governments make impressive gains in attaining these and other desirable public policy goals ... Regulations will continue to be an important tool for preserving and advancing public interests. There is a real risk, however, particularly in a time of profound and rapid change in economic and social conditions, that regulations can become an obstacle to achieving the very economic and social well-being for which they are intended. (OECD 1997a, p. 9)

This implies that such processes need first to identify what the public policy goals or public interests are and then the most efficient and effective means or tools which can be implemented to deliver these objectives.

In response to these recommendations myself and several work colleagues in MESA's Petroleum Division raised three fundamental questions:

- What are we regulating for? That is, what are the objectives of our regulatory regime?;
- Do we need to regulate the upstream petroleum industry at all in order to meet these objectives?; and
- If we do need to regulate, what is the most efficient and effective regulatory regime to enable the achievement of these objectives?

These questions motivated the research presented in this thesis. They also initiated the SPIRT project which is expected to commence fully in the 1998/99 financial year.

EXECUTIVE SUMMARY

This thesis presents a general model for health and safety and environmental (HS&E) regulation for the mining and upstream petroleum industries. The model was developed from research of the current literature which also identified a number of key issues that need to be considered in the performance evaluation of any regulatory strategy. Additionally, the thesis presents a review of the regulatory approaches currently adopted in Australia, New Zealand and Canada for the mining and upstream petroleum industries.

REGULATORY MODEL

The model presented consists of three key components (Fig. 1): an open and transparent stakeholder consultation process for establishing the regulatory objectives; a process for selecting the most appropriate regulatory strategy for achieving the regulatory objectives; and an effective means for enforcing the achievement of the regulatory objectives. Each of these components are the subject of Chapters 1, 2 and 3 respectively and are summarised below.

STAKEHOLDER CONSULTATION

Chapter 1 presents the need for an open and transparent stakeholder consultation process to facilitate informed decision-making by the regulator in the establishment of the regulatory objectives. It is argued that the regulatory objectives need to reflect the government's policy mandate as given to it by the electorate. Therefore an open and transparent process in establishing these objectives is needed to provide confidence to the stakeholders that the objectives do reflect government policy and not some other captured agenda. Openness is achieved by exposing the decision-making process to a diverse and inclusive group of stakeholders. Transparency is achieved by consulting on all significant issues through effective processes which utilise relevant and appropriate information.

REGULATORY STRATEGY SELECTION PROCESS

A process for selecting the most appropriate regulatory strategy for achieving the regulatory objectives is proposed in Chapter 2. It advocates a flexible selection process carried out on an individual company basis. As shown on the schematic of the process (Fig. 1), where market failure does not exist self-regulation is considered to be a viable option. However, where market failure does exist a two-tiered selection process is instigated. The first tier attempts to rectify the market failure by providing economic incentives by creating direct price signals through the use of various economic instruments (for example, taxes and charges, tradeable permits, liability schemes). Where this is not possible, it is argued that community empowerment through a co-regulatory strategy may indirectly create the economic incentives for company's to comply. These indirect price signals may come in the form of the threat of market boycotts on company products or the threat to survival through community pressure at the political level.

Where market failure cannot be rectified, the use of the second tier strategies are proposed. These strategies seek to control company behaviour and are selected on the basis of the individual company's compliance culture. Compliance culture is defined in Chapter 2 as the self-motivation and internal commitment of companies to comply with regulatory objectives. The lower the compliance culture the more interventionist the regulatory strategy becomes. For example, a very high compliance culture may only incur the use of a performance-based strategy which focuses on the achievement of the regulatory objectives and not on company methods or practices. At the other extreme, where a very low compliance culture is observed, a more stringent command-and-control strategy may need to be adopted which in addition to the achievement of the regulatory objectives also focuses on the methods and practices utilised by the company. With changing company compliance culture over time, the strategies may also need to be changed accordingly.

The importance of company compliance culture in such a selection process demands for a practical tool for assessing such culture. The tools presented in Chapter 2 for this purpose depend extensively on expert judgement rather than on objective assessment criteria. Therefore it is recommended that further research and investigation into

improving and refining the practicality of such a tool needs to be carried out if selection of regulatory strategies is to be based on compliance culture.

ENFORCEMENT STRATEGY

In Chapter 3 it is argued that other than for self-regulation, the use of appropriate and relevant government enforcement strategies to control and discourage non-compliant behaviour is an essential part of any regulatory strategy. Enforcement of compliance can best be achieved through a strategy which provides the most appropriate threat to companies for not complying without the need to resort to the application of such sanctions. Such a strategy is proposed in Chapter 3 based on the enforcement pyramid model of Ayres and Braithwaite (1992). This model consists of a hierarchy of sanctions with increasing severity where the use of the more severe sanctions are considered by the company to be likely in the event of persistent non-compliance.

EVALUATION OF REGULATORY STRATEGIES

As part of selecting the most appropriate strategy, the questions that need to be addressed are: whether or not the strategy is effective in achieving the regulatory objectives; and whether it is the most efficient strategy available in achieving the desired objectives. In Chapter 4, the definition of effectiveness is given as the extent to which a strategy can influence the delivery of the regulatory objectives. Efficiency is defined broadly from a distributional perspective of the costs and benefits among the various stakeholders of implementing a particular regulatory strategy. Chapter 4 also discusses the issues that need to be addressed in the evaluation of effectiveness and efficiency. It is argued that such an evaluation is fundamental to conducting a credible and useful cost-benefit analysis of regulatory proposals.

So far it appears that such evaluations have been limited in scope and in need of urgent redress if appropriate regulatory strategies can be selected on a rational scientific basis rather than left to political negotiation and discretion.

CURRENT REGULATORY PRACTICES

From the evidence presented in Chapter 5, it appears that currently in Australia, New Zealand and Canada there is evidence of a move away from the traditional command-and-control HS&E regulatory strategies for the mining and upstream petroleum industries. In the case of Australia and Canada there is a strong move towards performance-based and management-system based approaches in HS&E. In New Zealand a move towards management-system strategies is evident in health and safety but a dependency on industry self-regulatory codes of practice and initiatives is evident in the environment area.

The attitude of the mining and petroleum industries towards environmental and health and safety protection appears to be changing to one which is more pro-active in responding to regulatory issues. The adoption of voluntary Codes of Environmental Practice, environmental reporting and community consultation initiatives by these industries are all strong indicators of this changing attitude. With such a change in attitude comes a change in culture and hence a need for a change in the way these industries are regulated. The need for changes in the regulatory philosophy should not however be interpreted as a universal need to dispose of command-and-control and to adopt purely self regulatory initiatives. Instead, it demands for a more flexible and horses-for-courses approach to selecting the most appropriate regulatory strategy, including where needed the use of command-and-control or self regulation.
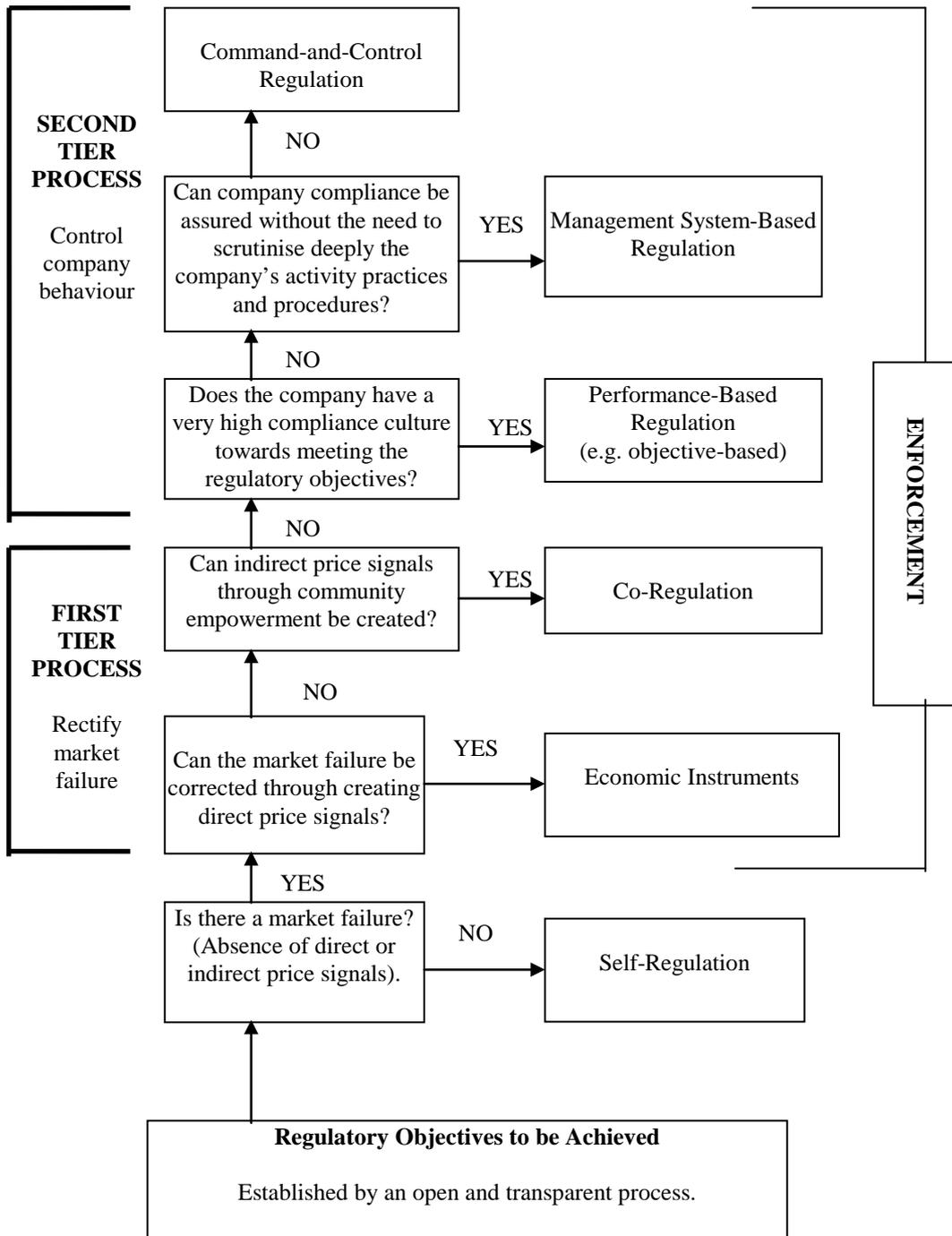
Figure 1. The proposed regulation model: a two-tiered regulatory strategy selection process.

CHAPTER 1: STAKEHOLDER CONSULTATION

INTRODUCTION

The definition of stakeholder used in this thesis is taken from the Australian Environment Protection Agency module on Community Consultation and Involvement for best practice environmental management in mining (EPA 1995, p.13). The definition includes people with a direct commercial interest — shareholders, employees, joint venturers and customers of regulated companies — and people with an interest in regulating company activities, such as local, state and national government agencies, government ministers and other politicians. Also included in the definition of stakeholder are people whose interests and values the activities of companies may affect — owners and occupiers of nearby land, townspeople, indigenous people, environmental interest groups and trade unions.

One of the key issues raised in the OECD report (1997a) on regulatory reform was the issue of regulation being regarded as a tool for attaining public policy goals, and not as an end in itself. In democratic countries these public policy goals should reflect the interests and values of the majority of stakeholders expressed through the electoral process. Government public policy goals tend to be statements of the government's intent to dealing with issues such as mining and the environment, and are often broadly focussed which set the direction in which the government will take on such issues when and if elected. It must be recognised that regulations though, deal with more specific issues at the activity or project level, for example, the impacts caused by company activities on the environment or on the health and safety of the public and company employees. Regulators must ensure that the regulations they create and enforce deliver outcomes which operationalise the intent of the public policy goals. To achieve this, the regulatory process must articulate objectives at the regulatory level relevant to the activities being regulated — referred to as the regulatory objectives from here on — which can effectively deliver the broader policy goals. To ensure that such regulatory objectives are coherent with the policy goals, it is important that they

are established in consultation with the stakeholders whose interests and values they are intended to reflect and protect.

The need for regulatory processes to serve stakeholder interests and values is made strongly by the OECD as an introduction to its ten guiding principles for good regulatory decisions where it states: 'the development of these regulatory systems in industrialised democracies must be judged as a successful governing response to the diverse interests and values of modern societies' (OECD 1995d, p. 1).

In response to this, the first guiding principle states:

> Is the problem correctly defined? ... Many problems are multi-faceted, affecting a variety of groups, and in these cases regulators should document the full scope of the issue, drawing particular attention to supporting and opposing linkages between groups and their incentives (OECD 1995d, p. 3).

As is argued in this chapter, serving all stakeholder interests and values completely in the establishment of the regulatory objectives is often an impossible task due to conflicting stakeholder interests and values. With respect to this thesis, the interests may vary from those of the environmental interest groups pertaining purely to environmental conservation and protection through to those of company shareholders pertaining purely to profit and exploitation of the natural resources to realise that profit.

ENABLING INFORMED DECISION-MAKING

Stakeholder consultation in the establishment of regulatory objectives is not intended to be about making the final decisions but relates to enabling informed decisions to be made by those people democratically elected to do so. In democratic countries such as Australia, the government is ultimately accountable to the citizens through the ballot box on election day. For this reason it is the government that has the final decision-making powers as provided to it democratically by the majority of the electorate on the basis of the government's public policy platform on those issues, and not on individual or minority interests. As put by Jacobs and Korhonen (1995, p. 30):

if government accountability is to be preserved, the right of citizens to be heard cannot become a right to take decisions themselves, especially if the system is open to capture. Consultation must be considered an adjunct to, rather than a replacement of, political and administrative decision-making.

However, to ensure that the regulatory objectives decided upon remain consistent with the policies upon which the government was elected, it is important for the rationale behind such decisions be made apparent to all stakeholders. This will provide assurance to all stakeholders that regulatory objectives are consistent with the government's election mandates and not captured by certain interests.

POLICY-MAKING PROCESS

Models found in the literature describing policy-making processes are presented below to demonstrate the difficulties that could be faced by regulators in determining regulatory objectives which reflect the interests and values of all stakeholders. It is argued that the best a regulatory system can achieve is the establishment of an open and transparent process through which informed decision-making on the regulatory objectives can be made.

In democratic countries, the diverse interests and values of modern society referred to by the OECD (1995d) are articulated through a process of interacting relationships of varying degrees between interest groups and government in the policy-making arena. These relationships can be illustrated theoretically through the classical, corporate and radical pluralist models (Bell & Head 1994; Jordan 1990a, 1990b) and through the models of policy communities and issue networks (Richardson & Jordan 1979; Heclo 1978).

These models seek to illustrate how policy goals are established in democratic countries. A representation of the true public interest depends on the degree to which the various interests in society are represented and the degree of power differential between those interests in the policy-making process. That is, the fewer interests represented and/or the greater the imbalance in political power between the various interests impacts on the achievement of a representative view.

In terms of meeting the above OECD principle in establishing regulatory objectives it is of paramount importance to select a model of stakeholder consultation that involves as many of the diverse interests and values in society as possible. This model forms the foundation upon which the regulatory system is built. Thus a poor foundation would lead ultimately to a collapse in stakeholder confidence of any such system.

CLASSICAL PLURALISM

Classical pluralism, which emerged as a theory in the 1950s and 1960s, advocates a political system open to a wide range of influences characterised by an open, fluid and *ad hoc* lobbying style relationship between the state and interest groups with diverse interests and values. The outcome of this is that no single group's interest prevails. Therefore the system is democratic and responsive to shifts in public opinion.

However, major criticisms of classical pluralism by Connolly (1969) and Bachrach & Baratz (1970) included:

- electoral competition and group bargaining under this model do not guarantee that the political system will be open and responsive to all groups;
- the perception that there is little chance that the interests of the most powerful economic groups can be challenged successfully;
- there is no guarantee that general issues and concerns such as conservation and environmental protection will be adequately articulated and protected.

As a result of these limitations the corporate and radical models of pluralism emerged.

CORPORATE PLURALISM

Corporate pluralism presents policy-making as a decentralised interaction between key government departments, advisory committees and a range of select interest groups (Jordan 1990b). This model depicts a structured, formal and integrated pattern of relationships between certain interest groups and the state (Streeck 1983). The various

groups brought into the policy-making process tend to be well organised, focussed and specialised in their areas of interest and they share basic values with the other participants.

By way of example, the traditional environmental policy-making process within MESA reflected corporate pluralism. Prior to the mid 1990s, the consultation process entailed varying degrees of consultation with:

- Other government agencies both at state and federal levels. At state level these included the then Department of Environment and Natural Resources (DENR) and the Environment Protection Agency (EPA). At the federal level the Department of Primary Industries and Energy (DPIE) and the Commonwealth Environment Protection Agency were the main agencies.

- Individual mining and petroleum companies and their representative industry groups such as the South Australian Chamber of Mines and Energy, the then Australian Petroleum Exploration Association (APEA) and the Minerals Council of Australia (MCA).

Environmental interest groups and the general public were very much secondary to the process: often policy documents were made available to them at the end of the process and shortly before the enactment of such policies.

RADICAL PLURALISM

This model embraces, the words of Charles Lindblom (1980, p. 71) "the privileged position of business in policy-making". That is, where a company or business is a major player in the economic development of a state or region, its political influence in the policy arena tends to dominate against other less economically significant interests. Governments in capitalist societies often give high priority to the extent of investment and employment. With business investment and employment being very much in the control of large private companies, these companies can exert a political influence to sway policy decisions in their favour. In countries such as Australia where

economic well-being is very much dependant on the prosperity of the natural resources industries, it is no surprise that the views and interests of the large mining and petroleum companies, and their various industry associations, figure prominently in the policy-making process on issues relating to these industries. The outcome of this is that contributions to the policy-making process are restricted to those with the most power (in this case economic) and the policy outcomes usually help their interests more than any other group's.

POLICY COMMUNITIES

Policy communities are characterised by the stability of relationships between the various groups, continuity of highly restrictive membership, vertical interdependence, and insulation from other groups and, invariably, the general public (Rhodes 1990).

The Richardson and Jordan (1979) model of policy communities reveals policy-making as a process consisting of a stable community or coalition of selective groups, including key government and non-government bodies, involved in regular policy-making roles. Policy-making according to this model occurs in discrete sectors corresponding to broad functional areas such as health, education, agriculture and mining. Relationships within such communities can be characterised as having preferred operating procedures, particularly in terms of consultation, compromise and the search for consensus (Bell & Head 1994). The groups have shared values and interests which ensure consistent and consensual outcomes. The membership is very limited with some groups deliberately excluded (Dowding 1995).

ISSUE NETWORKS

Hugh Heclo's (1978) concept of issue networks models a policy-making process that is fragmented and populated by a wide and unpredictable number of participants. The backgrounds and interests of these participants is so diverse and unrelated that the system borders on chaos. Heclo argued for a policy-making process consisting of discrete 'issue networks' which influence decision-making in a very disjointed and informal manner.

Key differences between the issue network and policy community models are presented in Table 1.

Table 1: Comparison of policy communities and issue networks

(after Marsh & Rhodes 1992, p. 251)

Dimension	Policy Community	Issue Network
Membership		
Number of participants	Very limited number, some groups consciously excluded.	Large.
Type of interest	Economic and/or professional interests dominate.	Encompasses range of affected interests.
Integration		
Frequency of interaction	Frequent, high-quality interaction of all groups.	Contacts fluctuate in frequency and intensity.
Continuity	Membership, values, and outcomes consistent over time.	Access fluctuates significantly.
Consensus	All participants share basic values and accept the legitimacy of the outcome.	Some agreement exists but conflict is ever present.
Resources		
Distribution of resources	All participants have sufficient resources.	Some participants may have resources, others are limited.
Internal structure	Hierarchical; leaders can deliver members.	Varied, variable distribution and capacity to regulate members.
Power	There is a balance of power among members. Although one group may dominate, it must be a positive-sum game if the policy community is to persist.	Unequal powers, reflecting unequal resources and unequal access — zero-sum game.

As argued by Atkinson & Coleman (1992) the study of policy communities and issue networks has reinforced the image of the state that is traditionally found in pluralist theory. In these models the interplay of various interests whether in a structured and selective manner (policy community) or in an *ad hoc* informal manner (issue network)

are simply reiterations of the corporate pluralism and classical pluralism models respectively.

REGULATOR CAPTURE

As revealed in the corporate and radical pluralism and policy community models, it is evident that regulatory agencies can be made vulnerable to what is referred to as regulator capture if the involvement of other parties in the regulatory activities is confined to only selected stakeholders (Gow and Maher 1994; Jacobs & Korhonen 1995). Jacobs and Korhonen (1995) claim that this problem has been a long standing concern within the OECD community and that unfair influence by certain sectors in the community can undermine the credibility of the regulatory system and reduce compliance and government effectiveness. This influence is often dominated by well organised, specialised groups who are familiar with the regulatory process and structure, are experienced in making themselves heard and have much influence at the political level to affect the outcome.

HYBRID MODEL

In light of the vulnerability of the regulatory-objective-making process being captured by powerful interests, an attempt to achieve a stakeholder consultation process which strictly reflects the features of a classical pluralist model would be quite ambitious. Therefore, the best that can be achieved is to establish a hybrid model which integrates the formality and structured characteristics of the policy community model with the diversity and inclusiveness characteristics of the issue networks model. Depending on the location of the proposed regulated activity or project, in addition to the company proposing the activity, relevant stakeholders from government agencies, industry groups, non-government interest groups such as environmental interest groups and trade unions and local community members need to be identified and then allowed to participate. The aim is to expand the formalised membership so as to encapsulate a sufficiently wide range of interests within the regulatory-objective setting process. This will create the openness and transparency to the decision-making process to encourage informed decisions to be taken and to provide sufficient assurance to the

stakeholders that the regulatory objectives are in line with the government's democratically elected mandate on the issues being addressed.

As argued by Landy et al. (1994), the regulatory system, confined by the limits of achieving the ideal classical pluralist model, should strive for a system which at best can:

- Deliberate with as many interests as possible so as to lead to scientific as well as ethical enlightenment. It aims to expand the available information, enlarge the set of options and broaden understanding. At best it can improve foresight by encouraging the full discussion of the possible results of alternative courses of action.
- Integrate relevant expertise in the deliberation process where needed. The system must foster the involvement of various kinds of experts from both within and from outside government agencies.
- Make accountable the elected leaders to the broader community. That is, the system must deliver informed regulatory decision-making which can be justified on the basis of fact not on political bargaining.

In other words, this open and transparent consultation process will lead to balanced decision-making through an awareness by the decision makers that knowledge of the decision-making process is no longer confined to only one set of interests.

KEY COMPONENTS OF STAKEHOLDER CONSULTATION

Once the membership of the stakeholder group is established, and this may vary depending on the type of regulated activity and its location, openness and transparency in the decision-making process needs to be facilitated. To achieve this the following key components in the decision-making process are proposed.

- *Identification of issues:* For each particular activity or project proposal the regulator will need to identify the issues that will need to be consulted on.

- *Consultation technique:* The regulator needs to select the most appropriate technique to effectively carry out the stakeholder consultation.
- *Provision of relevant information:* The relevant information needed in the consultation process needs to be identified and made available to the stakeholders.

IDENTIFICATION OF ISSUES

Under the Australian federal *Environment Protection (Impact of Proposals) Act, 1974* and the South Australian *Development Act, 1993* formal stakeholder consultation processes are required prior to the undertaking of activities or projects. These processes require either an environmental impact statement (EIS) or a public environment report (PER) disclosing the environmental impacts of proposed activities deemed to be environmentally significant. Activity environmental significance is determined through an assessment of the proposal's environmental, social and economic significance. This assessment is used to ascertain the extent of stakeholder consultation needed and the issues required to be addressed by the consultation process.

The aim of the process is to enable the regulator to establish conditions of approval which are relevant and appropriate to the proposal. The key to achieving this is to successfully identify the significant issues that need to be addressed by stakeholder consultation and subsequently incorporated into the regulatory objectives or approval conditions for the proposed activity. Therefore a tool for identifying such significant issues is an important component of the consultation process. Criteria upon which the environmental, social and economic significance of potential impacts of a proposed activity or project can be determined have been offered by the Australian and New Zealand Environment and Conservation Council (ANZECC 1996). The significance of the proposed activity is determined by utilising a series of questions for each of the following criteria:

- The character of the receiving environment;
- The potential impacts of the proposal;
- Resilience of the environment to cope with change;

- Confidence of prediction of impacts;

- Presence of a planning or policy framework or other statutory approval processes;

- Degree of public interest.

Similarly, criteria for determining significant issues have also been proposed for use in the assessment of activities under the South Australian Petroleum Act (MESA 1997a). The criteria against which an activity proposal is assessed are:

- *Predictability criterion*: where the level of certainty in the prediction of the potential impacts, frequency of the events which may result in such impacts and the consequences of the impacts is determined.

- *Manageability criterion*: where the degree to which the consequences of the potential impacts can be managed to be insignificant.

A scale of 1 to 5 is used to score each of the potential impacts against these criteria and with increasing scores attained, the higher becomes the environmental, social or economic significance.

CONSULTATION TECHNIQUES

Once the issues to be consulted on have been identified, the next step is to determine the most effective technique in facilitating communication between stakeholders. A number of such techniques are summarised below (Table 2) as extracted from the Canadian Standards Association guide to public involvement (CSA 1995). These techniques are to be selected on the basis of their appropriateness to the issues to be addressed and the number and location of stakeholders. More than one of these techniques may be used.

Table 2. Summary of Consultation Techniques

(extracted from CSA 1995)

Technique	Description	Appropriateness
Open houses	A drop-in event to allow people to obtain information at their convenience. Visual displays, handouts and staff to answer and solicit views utilised.	Diverse and large number of stakeholders spread widely across region. Large projects within highly populated regions.
Site visits	Inviting stakeholders to visit a particular site to obtain and exchange first-hand information at the site of the activity.	Small number of stakeholders and site specific activity or project proposed.
Public meetings	Provides an opportunity to inform large groups of stakeholders and for them to exchange comments and information. Chaired and facilitated by neutral party and follows set agenda.	Information exchange at a local level.
Print &/or electronic bulletins	Involves the use of local and/or national newspapers, E-mail, Internet, World Wide Web etc for the notification of project proposals and dissemination and exchange of large amounts of information on the proposed activity.	Diverse and large number of stakeholders spread widely across region. Large and high profile projects requiring dissemination and deliberation of large amount of information.
Workshops/focus groups	Carefully planned forum designed to air specific issues and to share points of view. Individual stakeholders work together on a common problem or task.	Limited to a small number of invited stakeholders. Not constructive when dealing with highly contentious issues between diverse interests.
Advisory committees	Group of representatives from a particular community or set of interests appointed to provide comments and advice on an issue.	Where stakeholders comprise mainly of groups rather than individual members.
Polls/surveys/ questionnaires	Used to measure the mix of opinions held by various stakeholders on the basis of pre-determined questions.	Diverse and large number of stakeholders spread widely across region. Large and contentious projects within highly populated regions where decisions need some guidance to overall attitudes.
Negotiation	A voluntary process where parties in conflict agree to sit down and resolve differences.	Highly contentious issues where agreement between stakeholders unlikely, best works with smaller stakeholder numbers.

PROVISION OF RELEVANT INFORMATION

Identifying the relevant issues to consult on and the most appropriate technique for consulting on them are vital components of the consultation process because they facilitate the effective discussion and communication between stakeholders by enabling them to express their views and concerns on the relevant issues. However, without access to relevant and appropriate information, the process can become nothing more than a 'talk fest' which does not empower the stakeholders to focus on the relevant questions and issues. As was pointed out by a senior representative of the World Wide Fund for Nature at the 1997 Australian Petroleum Production and Exploration (APPEA) Conference:

> The community wants action not just talk. In addition, over the past decade the community has become more technologically literate and is increasingly demanding appropriate, quality information about health, safety and environment issues from government, business and industry (Rae 1997).

Therefore, the type, quality and form of presentation of data and information provided to all stakeholders needs to be addressed by the regulatory process. To participate adequately and to make informed decisions about the regulatory objectives requires that all information provided to the stakeholders is reliable and credible.

Reliable and credible information can empower non-industry stakeholders in particular by:

- Allowing them to participate in any consultation process in an informed and authoritative way. This will redress the common industry perception that the lack of knowledge of non-industry stakeholders on the environmental issues faced by the natural resources industries impairs them from participating usefully in any consultation (MESA 1996b).
- Giving stakeholders the relevant facts to confront the industry directly in relation to regulatory performance. This also enables them to challenge and criticise the regulators for failing to enforce the agreed regulatory objectives.

In order to achieve the first means of empowerment, the consultation process requires the capacity to allow non-industry stakeholders to request and acquire the necessary information in a form and with a level of comprehensiveness to make informed judgements. Achieving the second means of empowerment, requires the provision of credible regulatory performance data. According to Rae (1997) there are two conditions to be met in this respect:

- the non-industry stakeholders are involved in the development of the performance standards against which a company's performance will be measured; and
- the performance has been audited against those standards by an independent third party or by the regulator.

CONCLUSION

The stakeholder consultation process presented here pertains to the establishment of regulatory objectives at the activity or project level which are consistent with the government's policy mandate given by the electorate. This consistency is assured through an open and transparent process as established through exposing the decision-making process to a diverse and inclusive stakeholder group encapsulating a wide range of interests and values. To facilitate informed decision-making, the consultation process must ensure that relevant and significant issues pertaining to the activity are identified and effectively communicated with the stakeholders incorporating relevant and appropriate information.

CHAPTER 2: REGULATORY STRATEGIES

INTRODUCTION

The focus of Chapter 1 was on the establishment of the ends to be achieved by the regulatory system so as to ensure that the regulatory objectives have credibility in the eyes of the stakeholders. In regards to the second issue raised in the OECD report on regulatory reform (OECD 1997a) pertaining to regulation as a tool for "attaining public policy goals", this chapter describes the tools or strategies needed to achieve this in the most efficient and effective way possible.

One of the ten OECD principles upon which regulatory decision-making should be made (OECD 1995c, 1995d) requires that the best form of government action be identified. This principle stipulates that:

> The decision about how to intervene may be as important as the decision whether to intervene ... Regulatory officials should be encouraged to carry out ... an informed consideration of regulatory and non-regulatory instruments. Such a consideration will support a process of systematic and open decision-making that uses the range of policy instruments more skilfully and creatively to achieve policy outcomes (OECD 1995d, p. 4).

This implies that flexibility in the choice of strategies to be deployed is crucial for ensuring the achievement of the regulatory objectives. It is argued in this chapter that the key to this choice is understanding the degree of self-motivation of companies to comply with the objectives. This self-motivation to comply is referred to as the company compliance culture. This chapter explores the issue of company compliance culture and suggests how various regulatory strategies can be selected on the basis of the company compliance culture.

COMPLIANCE CULTURE

DEFINING COMPLIANCE CULTURE

Compliance culture in the context of this thesis refers to the level of motivation by, and internal commitment in, a company to achieve regulatory objectives. Integral elements of a compliance culture relate to the attitudes, skills, awareness and actions demonstrated by the individuals at all levels within the company and the results achieved with respect to the regulatory objectives.

Handy (1985) explained that companies have differing cultures which reflect the differing sets of values, norms and beliefs within those companies. These cultures are affected by past experiences, the political and societal climates within which they operate, the technology of the type of work they do, their corporate aims and the kind of people that work in them. He argued that on the basis of differing cultures there is no one optimal management structure for all companies. Handy demonstrated that many of the failures of organisational management stem from the imposition of inappropriate management structures on a particular culture or from expecting a particular culture to thrive in an inappropriate climate.

This observation is extended in this thesis to include compliance with regulations, where selecting the most appropriate regulatory strategy should recognise a company's culture towards meeting its regulatory obligations.

IMPORTANCE OF COMPLIANCE CULTURE

The need to acknowledge the importance of company compliance culture in the selection of an appropriate regulatory strategy stems from the fundamental principles of Total Quality Management (TQM). Embracing the TQM principles as first presented by W. E. Deming in the 1930s, Morgan and Murgatroyd (1994) proposed a Triangle of Service Quality model for the management of organisational — including companies — performance (Fig. 2). This model emphasises that effective company management requires employee attitudes/commitment and competencies/skills for

fulfilling their responsibilities to be integrated with the company procedures and processes used to manage company activities.
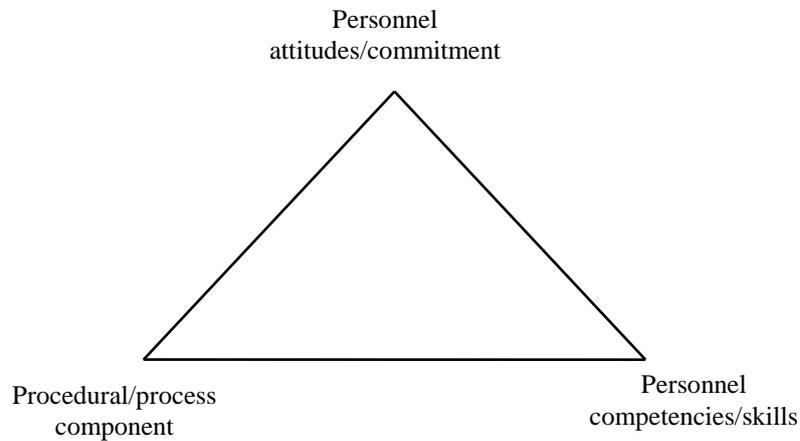
Figure 2: Triangle of Service Quality

(Morgan & Murgatroyd (1994))

To elaborate on these three aspects of service quality:

- *Procedural/Process Component*: This relates to the systems and practices adopted by a company so as to ensure that the necessary activities of its business are carried out. The focus of this aspect is mainly on ensuring that something that needs to be done is done and that it is done efficiently.

- *Attitude/Commitment*: This pertains to the enthusiasm and commitment of the company personnel towards meeting the company's objectives. This applies to all personnel: management, staff and contractors. The main focuses of this aspect are the personnel's awareness of their responsibilities and the extent to which they take this responsibility upon themselves to contribute to the achievement of the company's objectives.

- *Personal Competencies/Skills*: This is to ensure that the personnel are adequately trained and skilled to fulfil their responsibilities.

The procedural and process components of a company are referred to here as 'hard controls' which are often easily defined, implemented and monitored. The other two aspects are referred to as 'soft controls' which can be more difficult to define, implement and monitor. The soft controls make up the cultural elements of a company. These are often ignored in company management, where the lack of emphasis being placed on the essential requirements needed in changes in behaviour and culture within a company lead to an inability to implement quality principles effectively (Gome 1997). As demonstrated through the studies in the Management-System Strategies section in this chapter, this often leads to the failure of company performance. These soft controls are therefore considered as the main drivers in the achievement of company objectives: the hard controls are the tools adopted to facilitate this achievement.

The need to focus on the cultural elements of company performance in addition to the hard controls is now recognised by the internal auditing profession. Traditionally, internal auditing had taken a process checklist approach to assessing company performance where the soft controls were often overlooked (Simmons 1997). Several significant audit failures in the 1980s caused by traditional auditing forced the redefining of internal control in 1992 in the United States of America through the Committee of Sponsoring Organisations (COSO) then formed (COSO 1992). Other countries followed this move: the Institute of Internal Auditors of Australia with the released draft of the Australian Control Criteria (ACC) in late 1997 (ACC 1997). The COSO and ACC standards for internal control focused on the hard controls and the soft controls of staff integrity, values and management operating style.

The Australian Quality Council (AQC) also recognised the need to integrate the soft controls into the assessment of organisational performance through its Australian Quality Council Self Assessment Criteria (AQC 1996). Two of the seven areas assessed in a self-assessment of an organisation using the AQC criteria are the quality of the leadership and the people of the organisation. These areas relate to the cultural and competency aspects of an organisation which attempt to embrace the intent of TQM by assessing the human aspects (the culture and competency of the people) in the organisation. For example, the leadership of an organisation is assessed by

reviewing how the management in an organisation creates an effective environment through providing direction, support, continuity, cohesion and role modelling. The human aspects are assessed by reviewing how the full potential of people is realised, the extent to which people are involved and made responsible for achieving the organisation's goals and the degree of communication between all levels within the organisation.

In the case of regulatory compliance, a desire to adopt the easy hard controls can lead to compliance failure where the attitudes and commitment and competency of company personnel towards such compliance are inadvertently ignored. This observation was highlighted in the report of the inquiry into the Piper Alpha production platform accident in the North Sea in 1988 (Cullen 1990). One of the main points in the report was that the responsibility for safety should be put more clearly on the companies rather than the regulator. The implications were that in order to achieve an acceptable level of safety, companies need to enhance employee and contractor safety responsibility. Company employees and contractors need to become more aware of the hazards and personally contribute to the identification and mitigation of the risks of such hazards to as low as reasonably practical. The report criticised the regulations existing at the time of the accident, citing that they were overly prescriptive and inflexible. The report claimed that these regulations had contributed significantly to the adoption of inappropriate work practices and a complacent workplace attitude towards safety resulting in the accident which killed 167 people on the Piper Alpha.

The fundamental importance of a desirable culture in an organisation to ensure the effective operation of safety management systems was echoed by a health and safety professional with more than 20 years' experience in the regulatory authority of health and safety in the UK Health and Safety Executive: 'the raised levels of awareness of the importance of a safety culture could be said to be one of the major successes of the safety case regime' (Whewell 1997).

The importance of company culture in achieving regulatory compliance is reflected by the resource-based view of company environmental performance presented by Russo

and Fouts (1997). They argued that the ability of a company to integrate good environmental performance and profitability is dependent on the degree to which a company can integrate its tangible and intangible resources. The tangible resources include financial reserves and physical resources such as plant, equipment and raw material. Intangible resources include reputation, technology and human resources; the latter includes culture, namely the training, expertise, commitment and loyalty of the employees.

The importance of these soft controls in the context of regulation makes the company compliance culture an important element of any regulatory strategy.

MEASURING COMPLIANCE CULTURE

Despite the importance of compliance culture, the difficulty in measuring it has been the main reason why the focus is inevitably placed on the hard controls. One means for evaluating company compliance culture is through an assessment process known by the acronym ASET (Atmosphere, Systems, Environment and Targets) (Blewett & Shaw 1995). This was developed to assess management and employee commitment towards compliance in the area of occupational health and safety (OH&S). Equally, this can be applied to environmental regulation. The ASET model uses similar principles to the ACC standards and the AQC self-assessment criteria discussed above.

The four components of the ASET model assist in assessing the extent to which a company understands its regulatory responsibilities and the extent to which it has put in place the means for meeting them. Where:

- *Atmosphere:* This refers to the vision, values and attitudes of all employees in the organisation. Measures such as the number of field visits by senior managers and their commitment to, and understanding of OH&S and environment protection are used here. Also, attitude surveys of all employees are used to ascertain the perceptions and values of the organisation.

- *Systems:* This refers to the extent to which the values of an organisation are reflected in its operating procedures and the level of training and competency of its personnel to carry out their responsibilities to an adequate level.

- *Exposure:* This measures behaviours within the organisation: for example, the state of the workplace and the availability of the resources necessary to implement the vision and values.

- *Target:* This is the measure of the final outcome or results achieved by the organisation, such as the number of incidents or near misses which pertain to the achievement of compliance.

In simpler terms, a company's compliance culture can be assessed by the extent to which it can demonstrate:

- that it has in place appropriate systems and practices which will ensure that the regulatory objectives are achieved;

- that its employees and contractors at all levels in the company understand and are committed to their responsibilities to the achievement of the regulatory objectives;

- a company history of achieving regulatory objectives; and

- a company history of managing non-compliance events, that is, detection, response and reducing them to as low as reasonably practical.

The effectiveness of the ASET model depends extensively on expert judgement rather than on objective assessment criteria (Shinn 1998). This has tended to limit its use, hence has inadvertently maintained the focus of auditing on the hard controls. Therefore the need for further research and investigation into developing practical assessment tools of compliance culture remains. Rather than reinventing the wheel, it would make sense to carry out such an investigation by building on the ASET model components and on the AQC self-assessment criteria. Such an initiative is in urgent demand if compliance culture is to figure prominently in the selection of regulatory strategies. This needs to be explored in research such as that carried out under the SPIRT project.

UNDERPINNING MOTIVES OF COMPLIANCE CULTURE

Karp and Gaulding (1995) argued that the degree of compliance culture in companies and individuals is underpinned by motives relating to fear of being fined, greed (in terms of profit) or being socially responsible. However, it is argued below that for companies, the motives of fear and social responsibility are subsumed by the profit motive.

PROFIT AND SOCIAL RESPONSIBILITY

The motivation for companies to protect the public interest or the collective good of society through protecting the environment and/or worker health and safety on a voluntary basis is referred to here as socially responsible motivation. The existence of socially responsible motivation is based on research which has found that many companies, particularly large multinationals, have some self-driven motivation to do the right thing within the communities in which they work (Murray & Montanarie 1986; Stead et al. 1990). The research reveals that socially responsible motivation emanates from factors such as profit, legal mandate and long-term survival. It suggests that companies are motivated to behave in a socially responsible way to enhance their social image so as to improve their competitive position and to ensure long-term viability in the market place (Aupperle et al. 1985; Murray & Montanarie 1986). One implication of this research is that companies with longer term outlooks to business and hence profitability are more likely to demonstrate socially responsible behaviour.

A representative of the Australian chemical industry at a regulator's workshop in 1996 commented thus:

> The need for a program such as responsible care (a chemical industry self-regulatory initiative) by the chemical industry came about by the fact that our existence and let alone our long-term profitability was under severe threat from the poor public perceptions of the industry (PACIA 1996).

The need for companies to voluntarily deliver goods and services to the communities within which they operate when the profit motive is at risk was clearly put by one observer as:

The one overriding consistency about business is profit ... Business will take on social responsibilities if it has to, if the market demands it. It will build schools when it needs educated people. It will vaccinate when it needs healthy people. It will fight for human rights when those right-on folks at home stop buying the branded products ... It will do all these things and much, much more when its corporate reputation — and therefore its share value — is at risk (Knight 1997).

Therefore the selection of the most appropriate regulatory strategy depends on understanding how a company views its profit motive in relation to its need to achieve compliance. If it is viewed as short-term, it is likely to lead to an incentive to minimise compliance for quick profit. If profitability is viewed as a long-term issue, the incentive would be to demonstrate social responsibility for the purpose of preserving long-term existence and profitability. In the former case, a regulatory strategy with a high level of intervention may be needed to ensure compliance; in the latter case, a much less intervening regulatory strategy may suffice.

MARKET FAILURE

Basically, the underlying principle of the above argument is that the degree to which a company will voluntarily achieve the regulatory objectives depends on the degree to which a company has an economic incentive to internalise the costs of non-compliance. In the absence of such incentives, the tendency will be to externalise these costs (Morgenstern 1992); for example, in the form of pollution, land degradation or unsafe workplaces. In other words, if the market demands the achievement of the regulatory objectives then a company will voluntarily achieve compliance and adopt an appropriate compliance culture to do so. Where the market fails to send this message, then a form of market failure will exist where the costs of non-compliance are externalised onto other stakeholders (Gow & Maher 1994).

Market failure defined in the context of this thesis is where financial incentives for a company to protect the environment and provide safe workplaces do not exist. These financial incentives may take the form of either direct or indirect price signals which impact on the profitability of a company either positively or negatively. This can lead to inconsistent or conflicting company objectives with those of other stakeholders.

REGULATORY STRATEGY SELECTION

In light of the previous discussion on compliance culture and market failure, the most appropriate regulatory strategy for ensuring that compliance is achieved effectively and efficiently can be selected by addressing the following issues (as presented in order of priority):

- existence of market failure;
- if market failure exists, the effectiveness of available strategies in achieving compliance; and
- the relative efficiency of each strategy where more than one strategy may be appropriate.

Regulatory effectiveness is defined in Chapter 4 as the extent to which a regulatory strategy contributes to the achievement of the desired objectives; and efficiency is defined in the broader context, as the distributional efficiency of costs or benefits (financial and non-financial) of the regulatory strategy across the various stakeholders.

TWO-TIER SELECTION PROCESS

Where market failure exists, selecting the most appropriate regulatory strategy is modelled here as a two-tiered process:

- first, consideration is given to whether the market failure can be corrected by creating appropriate price signals to motivate compliant behaviour;
- second, where the market failure cannot be corrected by the first tier, the focus becomes on controlling the behaviour of companies by selecting the most appropriate strategy to ensure that companies manage their activities appropriately so as to minimise the effects of market failure.

In the case of the first tier, the aim is to create price signals which provide the necessary incentives for companies to internalise the costs of non-compliance. Possible means for creating such price signals are discussed later in this chapter under economic instruments and under co-regulation, where the latter is used to facilitate social responsible behaviour by companies.

SECOND TIER

The second tier process is instigated where the creation of price signals through the first tier approach is not possible. The level of regulatory intervention needed to facilitate compliance to the regulatory objectives is selected on the basis of the level of the existing compliance culture within the company being regulated. With decreasing levels of compliance culture the regulatory intervention becomes progressively higher, from performance-based strategies at the high end of compliance culture through to command-and-control (C&C) at the low end. The efficiency of the available strategies needs to be considered if it is possible to gain compliance with more than one strategy: the most efficient should be selected. In some cases, strict resource hungry C&C regulation may be the only viable option: in that case it would be regarded as the most efficient (Latin 1985).

ABSENCE OF MARKET FAILURE: SELF-REGULATION

In the absence of market failure, the underpinning profit motive of a company can be considered sufficient to foster the necessary compliance culture. In this ideal situation, self-regulation is a viable option for achieving compliance. Self-regulation is defined as the control of the behaviour of individual companies or a group of companies in a particular industry, through self developed and enforced codes of practice and performance standards (OECD 1994). This involves, independent of government and public involvement (Rees 1988):

- establishment of performance standards or codes of practice to be followed by individual companies and/or the industry sectors which will achieve the regulatory objectives;

- monitoring company/industry performance and/or that of their peers against those standards and ensure that they are meeting the regulatory objectives; and

- enforcing compliance.

In the context of environment and health and safety protection where direct price signals do not exist naturally, self-regulation may be considered as a likely strategy only where the viability and existence of companies or a whole industry can be genuinely threatened by the community within which they operate. That is, through these indirect price signals the company can no longer continue if the community finds it unacceptable and has the ability to apply the political pressure to close it or the industry down. Recognising this as a real threat, a company or industry is driven to establish and demonstrate a self-driven compliance culture. Evidence of this is reflected in the quote from the chemical industry representative cited above when a self-regulatory initiative, Responsible Care, was undertaken by the chemical industry (Gunningham 1995). Under this situation non-compliances are internalised by a company.

Self-regulation could be possible for environmental protection or work place safety in the mining and upstream petroleum industries, where the boards of high profile companies seek a good corporate image. This is particularly so given that the activities of such companies are often at a scale which inadvertently attracts public scrutiny and media attention. Such companies are so highly recognised throughout the community that it is impossible for them to be inconspicuous in the event of something going wrong. Any adverse outcome of their activities is immediately apparent and it can have immediate impact on the image of the company and ultimately its market value.

STRENGTHS OF SELF-REGULATION

According to Gunningham (1995) the advantages of self-regulation include:

- speed and flexibility in carrying out activities;

- greater sensitivity to market circumstances;

- lower compliance costs;

- more practical standards because they are developed by practitioners with a detailed knowledge of the industry;

- effective policing of performance within the industry or company; and

- a significant rise in the standard of behaviour because self-regulation requires ethical standards of conduct, which can extend beyond the letter of the law.

LIMITS OF SELF-REGULATION

The limitations of self-regulation particularly in areas of environmental protection and work place safety are perceived by Braithwaite and Fisse (1987); Cerexbe (1988); Page (1980); Gunningham (1995) and Karp and Gaulding (1995) as:

- potentially serving the interests of the industry at the expense of the public interest;

- conservation groups and other public groups seeing self-regulation as nothing more than an attempt by self-interested parties to give appearance of regulation so as to discourage government intervention;

- self-regulatory standards are usually weak;

- enforcement is ineffective and punishment is secret and mild;

- the economic bottom line will eventually influence behaviour; and

- in the case of industry-based self-regulation the attraction exists for some companies to "free-ride" on the good performance of others. This attraction increases with group size where the anonymity of offenders is difficult to overcome. This can result in putting those companies which do comply at a competitive disadvantage, thus undermining their initial good intent.

OTHER CONSIDERATIONS

The degree to which the community can influence company self-regulation depends on many factors. These include: the political environment within which the company

is operating; the level of community awareness of the issues pertaining to the industry; and the values and concerns of other stakeholders. Other factors include: the size and public exposure of the company and its industry; the human, technical and economic resources available to the organisation to address issues of compliance; and its fundamental corporate values and those of its personnel, whether they be economic, altruistic or a mixture of both.

It is essential that all such factors need to be considered when assessing the viability of adopting a self-regulatory strategy. As the factors change so could the extent of the compliance culture. These factors and influences may vary between companies, within the same company operating in more than one location nationally and/or internationally, or they may simply vary over time. For instance, with all other factors being equal, a company working in two countries with highly contrasting political and community values may demonstrate significantly different motivations to self-regulating environmental protection and safety in the two countries. In one country the company may be motivated to maximise its short-term profit at any expense due to the local political and social conditions. In the other country it may be motivated to operate in an ecologically sustainable manner at the expense of higher short-term profits to ensure it maintains community acceptance in the long-term.

FIRST TIER REGULATORY STRATEGIES

Where market failure is identified, and therefore self-regulation is not appropriate, the first question to be asked is whether or not the market failure can be rectified through creating the necessary price signals. This section presents and discusses strategies which can be considered for doing this. The assumption is that if these first tier strategies are viable they can create appropriate price signals to facilitate the desired compliance culture through the direct pursuit of company profit.

ECONOMIC INSTRUMENT STRATEGIES

Where appropriate price signals do not exist naturally, in the view of the world of neo-classical economists the most efficient regulatory strategy is one which creates

economic incentives for companies to achieve compliant behaviour. The objective of these strategies is to establish appropriate price signals which lead to the efficient internalisation of non-compliance costs (Kahn 1984). That is, putting the cost of non-compliance directly onto the balance sheet.

For effective use in environmental and health and safety protection it is essential that at least surrogate prices appropriate for pricing the external costs such as air pollution, land degradation, loss in biodiversity or unsafe work places can be set. By establishing such prices, it is claimed that companies will reduce their negative externalities through the financial incentive to adopt more efficient and innovative technologies (Morgenstern 1992). The literature identifies the following types of economic instruments (EIs) for achieving this.

CHARGES AND TAXES

Charges and taxes imposed by the government are to be paid by polluters for levels of environmental harm and pollution emission above acceptable limits. The aim is to set these charges and taxes at a level which motivates companies to find more efficient and effective ways of reducing pollution. The risk is that if the cost of reducing pollution is greater than the marginal cost of the charges and taxes then the incentive to cease polluting will not be minimised. However, it may be difficult, in a political context, to establish charges large enough to achieve environmental objectives (Stavins 1992). Gartner (1992) identified two difficulties with this approach:

- the undesirability of government being seen as introducing new taxes; and
- pollution taxes and charges being perceived as condoning environmentally harmful behaviour.

SUBSIDIES

The use of subsidies includes the government making direct or indirect payments (for example, tax concessions) to a company for achieving a desired level of environmental performance. Such performance may include the adoption of cleaner

technology or clean-up expenses such as mine site rehabilitation. The major disadvantage of subsidies is that they are a significant drain on public funds, and create allocative inefficiency.

TRADEABLE PERMITS

Unlike charges and taxes, tradeable permits allow the government to specify an overall level of allowable pollution. This total quantity of allowable emissions or environmental harm is parceled out or allotted in the form of tradeable permits or rights which can then be bought and sold like any other commodity. Companies that keep their emissions or environmental harm below the allotted level may then sell or lease their surplus to others (Stavins 1992). This approach in effect creates a surrogate market for a defined and acceptable level of environmental harm (Swanson 1995). It focuses on the economic profit motives of companies, where those with low marginal abatement costs will continue to reduce their levels of pollution or other forms of environmental harm until the cost of further reduction is equal to or greater than that of purchasing pollution permits. On the other hand, those companies with high marginal abatement costs will continue to pollute until the cost of purchasing pollution permits is equal to or greater than its marginal abatement costs. Therefore, for companies with low abatement costs the incentive is to sell their excess permit rights at a profit to those companies with high abatement costs (Ackerman & Stewart 1985).

As is the case for charges and taxes, the main application of market permits has been for air pollution emissions (Morgenstern 1992; Swanson 1995; James 1993). In areas of environmental harm such as land degradation or loss in biodiversity, tradeable permits have not been applied. The difficulties faced in establishing tradeable permits include:

- defining what constitutes pollution in the first place, which could be difficult in the case of land degradation and biodiversity, and then determining the total level of acceptable pollution such as emissions, land degradation and loss of biodiversity;

- ensuring a sufficient number of companies are available for a competitive market to transpire; and

- preventing the hoarding of permits, which could result in anti-competitive behaviour which limit new entrants and drive out competitors.

LIABILITY SCHEME

This scheme is generally reliant on the court system which, through civil liability, motivates companies to achieve compliant behaviour. Such a scheme is largely independent of direct regulatory intervention and is imposed by general civil and corporate laws of the land. Sole dependency on a liability scheme can be ineffective in sustaining acceptable environmental and health and safety performance because such schemes can initiate long and expensive litigation, which may not be worthwhile in small cases of non-compliance or where the long-term environmental damage and causation is difficult to ascertain (Brandon & Ramankutty 1993). Another problem is that such a scheme is only effective if the capital or liability insurance of polluters is sufficient to cover all possible liability claims.

To overcome some of these problems, liability insurance could be made mandatory, which could have a positive secondary effect in that insurers may take on environmental monitoring to allow them to set insurance rates according to the environmental risks and ensuring that the insured parties are minimising such risks (Von Amsberg 1997). Liability schemes have demonstrated significant success in the area of occupational health and safety. For example, insurance schemes either through compulsory government schemes such as Workcover in South Australia or company self-insurance requirements have enforced safe work places via performance-based premiums.

PERFORMANCE-BOND SCHEMES

The performance bond schemes are commonly used in the mining industry to cover any costs for mine site rehabilitation which the company may fail to carry out to the satisfaction of the regulator upon the completion of the company's operations. This

involves the company depositing a security deposit or bond with the regulator which is redeemable upon satisfactory completion of any required rehabilitation of abandoned work sites. In the event that a company fails to undertake satisfactory rehabilitation, all or part of the bond may be used by the regulator to do so.

The limitations of such a scheme are:

- the size of the bond needs to be adequate to cover any potential damage;
- the potential damage needs to be estimated accurately; and
- the incentive for companies to pass costs on to the rehabilitation fund.

CO-REGULATORY STRATEGY

EIs as discussed in the previous section aim to create direct price signals where they do not naturally exist in the market so as to rectify the market failure. Where direct price signals are absent or cannot be created, consideration should be given to creating them indirectly through attempts to embrace the social responsible motives discussed earlier. By facilitating a need for social responsibility where it does not exist may be an effective way to facilitate compliant behaviour without the need for direct regulatory intervention. One way of achieving this is through the adoption of co-regulation (Majone 1983; Aalders 1993; Gunningham 1995). Under co-regulation the various stakeholders in the community are empowered to oversee company performance through legal access to company performance reports or the acquisition of their own performance data and the right to instigate prosecution on non-compliance. The aim of such a strategy is to provide the motivation for companies to implement self-regulation through an awareness that the community is monitoring their behaviour and has the power and knowledge to threaten their existence if they fail to perform.

The key features of co-regulation include:

- in conjunction with the industry, the community is proactively involved in developing the environmental performance standards which the industry will be required to achieve;

- measurement and monitoring of industry performance against those standards in a manner which is understood by the community;

- empowering the community through access to environmental performance information and powers to monitor compliance and instigate prosecution where needed; and

- a very much hands-off government role whereby its involvement is more to oversee the honesty and integrity of the process and providing the necessary institutions and mechanisms for prosecuting violating companies where needed.

Co-regulation works in facilitating the social responsibility motives of companies. It is a quasi-self-regulatory strategy when it seeks to create the necessary indirect price signals through community empowerment.

LIMITATIONS OF CO-REGULATION

From the features discussed above it is apparent that the effectiveness of co-regulation is dependent on the extent to which the community becomes proactive in the regulatory process. The extent of this involvement is likely to be influenced by the level of the community ownership or stake in the need for a clean environment and/or safe workplaces. In the case of the chemical industries Responsible Care program, the argument by Gunningham (1995) that co-regulation can make this program more effective is accurate because of the fact that the local community live in the environment directly affected by the spillovers from the chemical companies. Therefore the local communities have a real and direct stake in the performance of the chemical companies. This stake provides the motivation for the local communities to be proactive in reviewing and monitoring company performance making co-regulation viable and appropriate for this situation.

Where such a stake is not so clearly linked to a community, the incentive for the community to become proactive is unlikely to be as great. For example, where there

are no local communities or where direct stakeholders are not readily identified, company performance is unlikely to receive sufficient third party scrutiny to make co-regulation viable. The lack of such ownership can be considered as another form of market failure and the main limitation to implementing an effective co-regulatory regime.

As in the case of the majority of mining and upstream petroleum industries in Australia, where industries exist in isolated and sparsely populated regions the feasibility of co-regulation can be limited. The lack of third party ownership of the environmental assets in such regions is likely to make co-regulation inappropriate for these situations.

SECOND TIER REGULATORY STRATEGIES

Where market failure exists and cannot be rectified through EIs or by co-regulation, government intervention through some form of more direct regulation is necessary. However, despite there being a market failure of the kind where there is no real economic incentive for companies to comply voluntarily, it does not necessarily imply that all companies will pursue the profit motive to the same degree of disregard of the community interests. As argued earlier, a company's compliance culture relates to the extent to which it views non-compliance as a threat to its long-term profitability and survival.

In the absence of either real price signals or effective community scrutiny of company performance, under self-regulation the temptation to externalise non-compliance costs will always be there. This would be regardless of how good a company's socially responsible compliance culture is. For this reason some form of regulatory intervention would be needed to control company behaviour. However, a one-size-fits-all approach to selecting the regulatory strategy to manage the risk of non-compliant behaviour can be both inefficient and ineffective. Inefficiencies will occur in terms of regulatory and company resource requirements where strict and inflexible strategies are used for companies which have a high degree of compliance culture.

Similarly, strategies will not be effective where they give too much flexibility to companies with a low degree of compliance culture.

Therefore, the argument under the second tier process is that some degree of regulatory intervention is needed. However, this should be selected on an individual company basis depending on the degree of compliance culture demonstrated by each company. In ascending order of regulatory intervention, possible regulatory strategies that could be selected are presented in the remaining part of this chapter. The selection process of these strategies is summarised in Figure 1 in the executive summary of this thesis.

PERFORMANCE-BASED STRATEGIES

Where a company can demonstrate that it has high compliance culture, then it will be more efficient for the regulator to focus on the performance of the company at the regulatory objective level than to use more intervening strategies (Martin 1995).

Performance-based strategies, often referred to in the literature as either goal-oriented, objective-based, performance-oriented or performance-based regulation (PBR), seek to measure the achievement of the objectives and to be neutral as to the possible means by which they are to be achieved (Oleszkiewicz 1994).

STRENGTHS OF PERFORMANCE-BASED STRATEGIES

The advantages of performance-based strategies as defined by Martin (1995) include:

- reducing the volume of prescriptive recipe-type regulation on how to do things, which allows companies to be more responsible for the details of how they meet regulatory objectives;
- improving company understanding of their regulatory obligations (making it easier for them to comply) by focussing on the intent and objectives of the regulations; and

- companies have the ability to develop and adopt practices which reduce their compliance costs providing that the objectives are met.

LIMITATIONS OF PERFORMANCE-BASED STRATEGIES

The advantages cited above rely strongly on the requirement that the regulatory objectives can be effectively measured. This may be very much the case where the boundary between compliant and non-compliant behaviour can be easily quantified. In cases where non-compliant behaviour can be clearly identified by measurable outcomes of the regulated party, such as levels of pollutants measured in quantifiable units of production (for example, parts per million, percentage of mass in discharge stream or number of lost time injuries), then the use of PBR can be quite straightforward. However, where impacts are not as readily quantified, the application of PBR strategies may not be as straightforward. This is particularly so in the case of environmental impacts (which are predominantly disturbances to land, vegetation and natural features of the landscape) which are not easy to quantify.

GOAL ATTAINMENT SCALING

This limitation was highlighted by PIRSA's Petroleum Group in its proposal to introduce objective-based strategies in regulating the upstream petroleum industry (MESA 1996). As a result, a technique known as Goal Attainment Scaling (GAS) was introduced by Professor Colin Sharp (Sharp 1994, 1996, 1997) of the Flinders Institute of Public Policy and Management (Flinders University of South Australia) to address this limitation. Subsequently, the concept of GAS has been widely adopted in South Australia for measuring industry performance against environmental management objectives (Malavazos 1995; Malavazos & Sharp 1997). The main feature of GAS is that for any goal (environmental or otherwise) stakeholders are involved in evaluating and seeking consensus on the most important aspects of the goals to be achieved within a particular timeframe and on the range of expected outcomes of the activities undertaken within such a timeframe. This technique forces participants to document the expected outcomes for each environmental goal ranging from much less than expected (quantified with a score of -2), less than expected (-1), expected (0), more

than expected (+1) and much more than expected (+2). The goals include the minimisation of visual impacts and the revegetation of abandoned sites. The outcomes defined for each objective are in terms of descriptive statements illustrated by photographic examples of the expected outcome (PIRSA, 1998b). GAS has proven very successful in addressing this limitation of performance measurement and is being widely used in both the upstream petroleum and mining industries in South Australia, and is also beginning to be introduced in other Australian jurisdictions.

MANAGEMENT-SYSTEM STRATEGIES

Where the regulator needs more assurance in a company's compliance culture than that needed to adopt a performance-based strategy, the regulatory scrutiny of how a company manages its activities may need to deepen. For instance, there may be sufficient confidence in the practices and procedures adopted by the company, but there may be less confidence that the company is committed and competent in deploying them. Under this scenario intervention may need to focus on the management systems which are utilised by the company to deploy the practices and procedures needed to meet the regulatory objectives.

A management-system-based regulatory strategy needs to address three key areas:

- the process elements of the system, that is how the system integrates and deploys all the crucial procedures and practices needed to ensure compliance with the regulatory objectives;
- the actual performance of the system against the regulatory objectives; and
- the level of commitment and understanding by the company employees of both the system itself and of the regulatory objectives and their responsibility in achieving compliance.

The adoption of management systems in the regulation of industry activities in Australia and overseas has been evident over the past decade, particularly in the area of occupational health and safety (Emmett 1995). The upstream petroleum industry has been very much a part of this trend, particularly with the worldwide introduction

of safety case regulation in offshore drilling and production operations since about 1990 (Whewell 1997). Safety case regulation is another term used to describe the adoption of management systems in the area of occupational health and safety on offshore drilling and production facilities. The introduction of safety case management system strategies for the offshore petroleum industry was initiated following the recommendations of the Lord Cullen inquiry (1990) into the Piper Alpha accident. The inquiry identified the cause as a result of the absence of effective safety management systems and commitment to safety and outdated regulatory approaches. One of the inquiry's recommendations was for regulatory strategies to focus more on the effectiveness of industry safety management systems and company commitment and attitudes towards safety and less on the daily and routine activities. In response to these findings, offshore petroleum industry regulators in Europe and Australia adopted the use of safety case management-system strategies for regulating safety (Whewell 1997).

The proposed adoption of management-system strategies in environmental regulation for the petroleum industry has also become apparent recently in Australia in regulatory review proposals for both the onshore (MESA 1997b) and offshore (DPIE 1997a) sectors of the industry. Similarly, some of the major mining companies operating in Australia have adopted the use of management systems in the areas of environment and health and safety (WMC 1996; Rio Tinto 1996). This significant trend towards the adoption of management systems in the natural resources industry has prompted the following detailed review of the management-system approach.

STRENGTHS OF MANAGEMENT-SYSTEM STRATEGIES

Some of the advantages of the use of management systems in regulation include:

- More regulators are now recognising that it is impossible to prevent all accidents regardless of the amount of regulatory resources available. Regulators are therefore focussing on ensuring that the risk of accidents is reduced by the regulated party to a level as low as reasonably practical. Management systems provide a systematic means by which the potential risks can be assessed and

managed to ensure that they are minimised accordingly. Regulators can judge the achievement of low level risks by focusing their attention on the interacting elements within the management system framework.

- The need to elicit repeatable performance outcomes from those being regulated and to provide assurance to the regulator that such performance is not due to mere luck but to a systematic approach undertaken by the regulated party.

- The work of a regulatory agency is being redefined from one which concentrates on individual incidents or violations in isolation to one that looks at broader problem areas or risks. Concentrating on, and reacting to, individual incidents or violations in isolation without looking deeper into their overall implications can often lead to overlooking longer term risks of specific activities. To address this, some regulatory agencies are focusing their attention on the use of management systems by the industries they regulate, which can detect and respond to non-compliances effectively (Sparrow 1994).

LIMITATIONS OF MANAGEMENT-SYSTEM STRATEGIES

Management systems need to be acknowledged for what they are — strictly management tools which require companies to measure and monitor progress, address problems and analyse and revise their management practices. This does not necessarily equate to the adequate establishment and achievement of outcomes and performance goals (Begley 1996; Gome 1997). In the context of being used as a regulatory tool, management systems can provide an effective framework for integrated monitoring, record keeping and consolidated reporting to regulators but they are not a panacea for providing confidence and assurance on company performance outcomes.

NEED FOR COMPLIANCE CULTURE

As discussed at the beginning of this chapter, in addition to the need to manage company processes and practices effectively, there is an equal need to manage the

cultural aspects within a company. The case studies into the breakdowns of management systems (see below) have one common observation which is either implied or highlighted directly, the element of human error. This can be brought about either by complacency or pure ignorance of what the management system requirements are. Despite the case studies dealing only with the failures in health and safety management systems, the implications of these observations can be extrapolated to potential limitations of management systems in general.

- A study into the role of health and safety management systems in the prevention of injury (Gun & Ryan 1994) found that safety management systems deemed to be highly desirable (that is, those exhibiting management and supervisor responsibility, OH&S as a standing item at executive meetings, safety committees, health and safety representatives and so on) had been widely adopted in Australia. However, they were found to be weakly and inconsistently associated with reducing the risk of sustaining injury. Much of this is claimed to be a direct result of either complacency brought about by a false sense of security that the management system will deliver the needed safety and the fact that many of those injured were simply unaware or poorly trained in the system requirements (Emmett 1995).

- The investigation into the 1986 disaster of the Challenger Space Shuttle in the United States of America highlighted that the cause of the breakdown of the safety system was not the information which was provided by the system, but the failure to communicate that information to the appropriate level of authority within the system (Vaughan 1990). As a consequence, informed decision-making on the O ring erosion problem on the main rocket booster, which was the cause of the explosion, was not possible. The failure of information communication was identified with a lower level project manager, who took no action despite continued requests for corrective action on the O rings from his technical personnel. Similarly, the audit of the system failed to detect this violation in not reporting such a serious problem to the appropriate decision-making authorities, despite the problem being extensively documented. Such accidents caused by human error, whether through complacency or total ignorance, highlight the

limitations of systems in the absence of appropriate attitudes and understanding of responsibility by those operating the system.

- As found by Turner (1976, 1978) in his study into accidents and social disasters, disasters had long incubation periods characterised by a number of discrepant events signalling danger. These events were overlooked or misinterpreted, accumulating unnoticed. He observed that these failures of foresight included norms and culturally accepted beliefs about hazards, poor communication and inadequate information handling in complex situations.

- A recent inquiry into an accident to a mobile offshore drilling rig off the coast of South Australia (Aust 1997) found that the key contribution to the accident was error in human judgement at critical times in the planning stage and during the operational phase of the project:

> in general, all parties had management systems, procedures and access to expertise sufficient to reduce the risk to the rig to as low as reasonably practical ... a degree of complacency had developed at a number of points in the total system which reduced its effectiveness to below that required to achieve a risk as low as reasonably practical (Aust 1997 p. 11).

- A drilling supervisor for onshore petroleum drilling was recently interviewed on the issue of the effectiveness of management systems for OH&S (Century Drilling 1997). His observations were that drilling personnel had become pre-occupied with the procedural aspects of the safety management system, such as filling in the right forms at the right time, establishing safety committees and labelling hazardous material appropriately. However, he observed that:

> many little accidents still occur because personnel fail to use common sense where needed and potentially serious situations are ignored because personnel fail to comprehend that the intention of the system is to make a safer work environment not to fill in forms (Century Drilling 1997).

All these cases clearly illustrate that management systems cannot be considered as superior tools which are devoid of human influence and therefore can always be relied

on to deliver the desired outcomes of safer workplaces or improved environmental protection. After Lord Cullen's (1990) inquiry, regulators worldwide hastily created an urgency for the adoption of safety-case management systems to regulate the safety of all offshore petroleum operations. This hastiness has resulted in many misapplications of the fundamental intentions of Lord Cullen's recommendations (Whewell 1997). These intentions included the adoption of risk-based concepts to regulation, where the ownership and commitment of identification and management of those risks was to be firmly put with the regulated party and not the regulator. The benefit of adopting this concept is that ownership and commitment leads to the development of positive safety cultures right through an organisation; that is, from the driller on the drilling floor to the board of management. Safety then becomes an inherent feature of the organisation's culture of doing business rather than an adjunct for the sake of satisfying regulatory requirements.

Unfortunately, such intentions were, and probably continue to be not fully understood by the regulators who are supposed to implement them. The main reason for this is that the regulatory culture in the petroleum industry has traditionally been non-risk based (Whewell 1997) in that it focuses on eliminating risk through the prescription of safety standards rather than on managing the risk to a level as low as reasonably practical. This compounded into stifling the development of the right safety culture within the companies needed to meet the intentions of the Lord Cullen's recommendations. As was observed by Malavazos (1997), all this has done is to simply refocus the industry away from traditional regulatory procedural requirements and to management systems rather than solving the heart of the safety problem, the safety culture of the company.

ROLE OF REGULATOR IN MANAGEMENT-SYSTEM STRATEGIES

One of the challenges of the regulator is to select the right level in the management system on which to focus regulatory scrutiny. Does a regulator become an auditor of the system? If so, the regulator risks the possibility of simply reverting back to procedural check listing, which as discussed above, does nothing to solve the problems for which management systems were introduced in the first place.

In addition to system audits, which can be carried out by the company or other parties, the regulator must also focus on the outcomes achieved by the management system and on the cultural aspects of the organisation being regulated. By monitoring the achievement of the prescribed performance objectives, the regulator can initially ascertain the overall performance of the regulated party in terms of its outcomes. The integration of these performance-based results with the results of system audits can be used to evaluate performance repeatability; that is, performance is being achieved through a systematic approach by the regulated party and not purely by chance. However, these results alone say nothing about the potential for system breakdown as a result of human complacency or error of judgement. Therefore, the regulator needs to monitor the compliance culture in the company. Auditing techniques such as the ASET model and the AQC self assessment criteria discussed at the beginning of this chapter can be used to ascertain the level of company compliance culture.

COMMAND-AND-CONTROL (C&C) STRATEGY

Where the regulator has very little or no confidence in the company's compliance culture, the highest level of regulatory intervention in the activities of that company will be needed. This confidence pertains to a company's ability to devise appropriate practices and procedures, systems and a commitment to achieving the regulatory objectives. Under this scenario, the regulator has no other option but to intervene through a command-and-control (C&C) strategy to ensure that appropriate practices and procedures are put in place.

C&C is the traditional strategy for regulation and is generally characterised as one which establishes and prescribes the specific technology, processes and practices to be adopted by industry, detailing the how and what to do. It requires the highest level of regulatory intervention in terms of prescribing the way a company is to carry out its activities and also in monitoring and enforcing what a company does and the level of pollution or safety to be achieved. Examples of such prescriptions include:

- technology-based standards, such as the best available technology, to be adopted by a particular industry; and

- process standards, specifying the operating procedures to be used in carrying out particular operations, such as how, what and when needs to be monitored and the design and operating parameters of equipment.

- uniform performance standards, specifying exactly what a company is required to achieve, for example, in terms of emission and pollution levels.

STRENGTHS OF COMMAND-AND-CONTROL

The strengths of this strategy have been described by Latin (1985):

- Consistency and predictability in the expectations of regulated parties. This strength provides the regulated party with certainty and clarity of its obligations and the regulator with ease in identifying non-compliance.

- Greater accessibility of decisions to public scrutiny. The prescription of regulatory requirements in black and white puts them out in the open for all to see and reduces the opportunities for manipulative behaviour by the regulatory agencies in response to political pressures.

- As a result of such prescription there is an increased likelihood that regulations will withstand judicial review.

- Strong authority over the behaviour of regulated parties is provided, which reduces opportunities for obstructive behaviour. This is particularly important where there is a threat of irreversible damage to the environment or the health of the community.

- The application of uniform standards results in the decreased likelihood of social dislocation and forum shopping resulting from competitive disadvantages between geographical regions or between firms in regulated industries.

The limitations of C&C strategies include:

- The prescriptive characteristics of C&C strategies tend to render them inflexible where changing circumstances occur. These circumstances include: different regional environments; the advent of new environmental problems; changes in public perceptions; and changes in technology which can be more efficient and effective in terms of protecting the environment and creating safer workplaces, but whose use is restricted by the regulations (Ackerman & Stewart 1985; Alm 1992; Stewart 1992).

- Technology-based regulatory standards which prescribe the methodology to be adopted tend to stifle incentive for companies to utilise creative and innovative solutions to resolve problems encountered. It assumes that the prescribed technology is an acceptable means regardless of the outcome. This can also stifle the achievement of an improved outcome by industry (Ackerman & Stewart 1985; Stavins 1992). A strong onus is often placed on the regulator to identify the methodology and technology to be used and then to update the regulations. This is often very impractical because the length of any regulatory review process could render the technology outdated by the time new regulations are devised and implemented.

- The application of uniform regulatory technology and process standards across all regions and companies within a particular industry can be economically inefficient because of the varying affordability of compliance between regions and companies (Ackerman & Stewart 1985; Stavins 1992; Von Amsberg 1997; OECD 1997a). This inefficiency has the potential to put companies out of business or impose additional costs onto the community within a region, such as job losses and reductions in the standards of living due to income losses.

- High costs to government in terms of the resources needed to determine that the prescribed technology and process standards have been adopted and the need to

continuously keep abreast of changes in technologies (OECD 1997a). Such determinations impose massive information-gathering burdens on regulators, and provide fertile ground for complex litigation in the form of massive adversary rulemaking proceedings and protracted judicial review. Given the high costs of regulatory compliance and the potential gains from litigation brought to defeat or delay regulatory requirements, it is often more cost-effective for industry to invest in such litigations rather than comply (Ackerman & Stewart 1985).

- Simply regulating whatever the pollutant under C&C, may preclude an agency from dealing adequately with more serious problems that come to scientific attention later. Also, foreseeing that all or nothing regulation of a given substance under C&C will involve large administrative and compliance costs, and recognising that resources are limited, regulatory agencies often seek to limit sharply the number of substances on the agenda for regulatory action (Ackerman & Stewart 1985).

Despite being more demanding for regulatory and company resources than other strategies, under some circumstances C&C may be the only viable regulatory option. That is, it may be the most efficient way of dealing with companies which cannot demonstrate the appropriate level of compliance culture either because of deliberate recalcitrance or innocent incompetence. As argued by Latin (1985, p. 1271) 'the critical issue is not which regulatory system aspires to ideal efficiency but which is most likely to prove effective'.

CONCLUSION

In this chapter a model was presented for selecting the most appropriate regulatory strategies needed to ensure that the regulatory objectives are achieved. It advocates a selection process carried out on an individual company basis rather than a one-size-fits-all approach. Where market failure exists, this process initially attempts to rectify the market failure using the first tier strategies to create an economic incentive for companies to comply. Second, where rectifying market failure is not possible, the most appropriate second tier strategy is selected to control the company behaviour on

the basis of the company's compliance culture. In the case of the second tier strategies, the lower the company compliance culture the more interventionist the regulatory strategy becomes. This selection process is summarised in figure 1 in the executive summary of this thesis. The process can be viewed as dynamic in the sense that selection of the most appropriate strategy remains open to review and adjustment in light of changes to company compliance culture over time. For example, if initially a C&C strategy was needed for a particular company, and over time the company compliance culture improved, then the regulatory strategy should also be reviewed to accommodate for this change in company culture. That is, in this case a move to a less interventionist strategy could be justified.

The tools presented in this chapter for assessing compliance culture — ASET model and AQC criteria — depend extensively on expert judgement rather than on established assessment criteria, therefore a need has been created for further research and investigation into improving and refining such tools. It is recommended that such research needs to be carried out urgently if compliance culture is to figure prominently in the selection of regulatory strategies.

CHAPTER 3: ENFORCEMENT STRATEGIES

INTRODUCTION

Other than the case of industry self-regulation where the enforcement of appropriate behaviour is the responsibility of the individual companies or of the industry group, the other regulatory strategies discussed in Chapter 2 require appropriate enforcement strategies to prevent inappropriate behaviour. In the case of first tier strategies, which aim to rectify the market failure, it would be expected that much less reliance on enforcement would be needed than in the case of second tier strategies. In the case of second tier strategies which aim to control behaviour, significant reliance is placed on effective enforcement.

This chapter will present an enforcement strategy which, like the selection process in the regulatory strategies, is based on the individual company and situation encountered rather than on a one-size-fits-all approach.

Law enforcement strategies have been presented in the literature as either of two basic models (Black 1976; Hawkins 1984; Reiss 1984; Bardach & Kagan 1982). The first model being a formal sanctioning strategy which enforces prescribed rules and seeks to punish indiscriminately any deviation from those rules. The second, an informal compliance strategy, seeks to enforce compliance through persuasive and flexible means without necessarily invoking the formal legal process.

SANCTIONING STRATEGY

The sanctioning strategy seeks to discourage non-compliant behaviour through the threat of punishment upon the detection of non-compliance. This strategy requires the regulator to identify breaches of the law through inspection and then through further investigation develop a case for the courts. Innocence or guilt is primarily left to the discretion of the judiciary and its nature is strictly one of either punishment or nothing (Black 1976, p. 4). As observed by Hawkins (1984) sanctioning tends to be associated with incidents of deviance which are essentially discrete, isolated and unpredictable.

Examples of such incidents include acts of social crime such as murder, assault and theft or the blatant, intentional disregard for, and breaking of, laws. This strategy works on the assumption that if sanctions are large enough and the probability of detection is perceived as high enough, the fear of punitive consequences can produce compliant behaviour (DiMento 1989).

LIMITATIONS OF SANCTIONING STRATEGY

Relying solely on a sanctioning strategy for enforcing compliant behaviour has limitations:

- Often punitive fines or compensation payments are not severe enough to discourage violations. Yet if they are too severe, such as licence cancellation, the enforcement agency due to other political pressures will find it difficult to invoke such sanctions (Ayres & Braithwaite 1992).

- A sanctioning philosophy is one which is reactive, that is, it waits for a violation to occur and then to be detected before taking action. In cases where the consequences of the violations may be irreversible or socially unacceptable, particularly in major environmental and safety accidents, the strategy is considered ineffective (Vaughan 1990).

- A sanctioning strategy encourages an organised business subculture of resistance to regulation wherein methods of legal resistance and counterattack are incorporated into the industry culture (Bardach & Kagan 1982). This results in 'a game of cat-and-mouse whereby firms defy the spirit of the law by exploiting loopholes, and the state writes more and more specific rules to cover the loopholes' (Ayres & Braithwaite 1992, p. 20).

- The strategy undermines the goodwill of those companies with a high compliance culture.

- It is very resource demanding of the regulator so as to ensure all violations are detected.

COMPLIANCE STRATEGY

Over the past decade or so, regulatory enforcement has been refocussed from traditional formal sanctioning processes to informal processes of securing compliance (Hawkins 1984; Reiss 1984; Frank & Lombness 1988; Longbein & Cornelius 1985; Amacher & Malik 1996). Under a compliance enforcement strategy recourse to the legal process is rare and is only instigated as a last resort. Compliance is sought not by threat but by negotiation, consultation, persuasion or technical assistance. The philosophy is to encourage a proactiveness on the part of the regulatory agency through identifying potential problem areas and seeking to ensure the regulations are adequately addressing or managing such areas. Unlike the sanctioning strategy, where the focus is on punishment in the event of a violation, under a compliance strategy the focus is on securing compliant behaviour: 'A compliance strategy seeks to prevent harm rather than punish an evil' (Hawkins 1984, p. 4). Detection of violations is important as a means of monitoring compliance and of enhancing prevention rather than as a means for punishment. In a compliance strategy judicial punishment as the main weapon in the regulator's armoury is seen as inappropriate. It is perceived as a risk to the ultimate goal of enforcement with the control left to the courts and legal system instead of the enforcement agency (Hawkins 1984).

LIMITATIONS OF COMPLIANCE STRATEGY

Relying solely on a compliance strategy for encouraging compliant behaviour has limitations:

- The vulnerability to encouraging complacency on both the regulated and the regulator.

- The enforcement agency can be perceived as being too lenient on offenders and as being captured by those whom it regulates thus the agency can lose its credibility in the eyes of the public (Mitnick 1980).

- The strategy can be exploited when actors are purely motivated by economic rationality (Ayres & Braithwaite 1992).

COMPLIANCE AND SANCTIONING ENFORCEMENT STRATEGY

In reality the line between using sanctioning or compliance enforcement strategies is quite blurred, particularly where the range of companies being regulated vary considerably in culture and hence in their motives to comply. At the two extremes of the compliance culture spectrum, the enforcement strategy to be adopted by the regulator can be relatively straightforward. However, for the intermediate companies a combination of both strategies is likely to be necessary. As demonstrated by the research of Frank and Lombness (1988), the success of a compliance strategy is often dependent on the perceived power of a regulatory agency to invoke severe sanctions. In many cases the power to persuade or negotiate compliance relies on the inspector's ability to "bluff" (Hawkins 1983); that is, to project a willingness to use sanctioning if necessary.

ENFORCEMENT PYRAMID

Ayres and Braithwaite (1992) claimed that compliance can be best obtained by striking a balance between the sanctioning and compliance strategy models. To achieve this balance they proposed the adoption of an enforcement pyramid model consisting of a hierarchy of sanctions, with increasing levels of severity from the bottom to the top of the pyramid (Fig. 3) and ensuring that the level of severity of the higher sanctions is adequate to elicit cooperative behaviour.
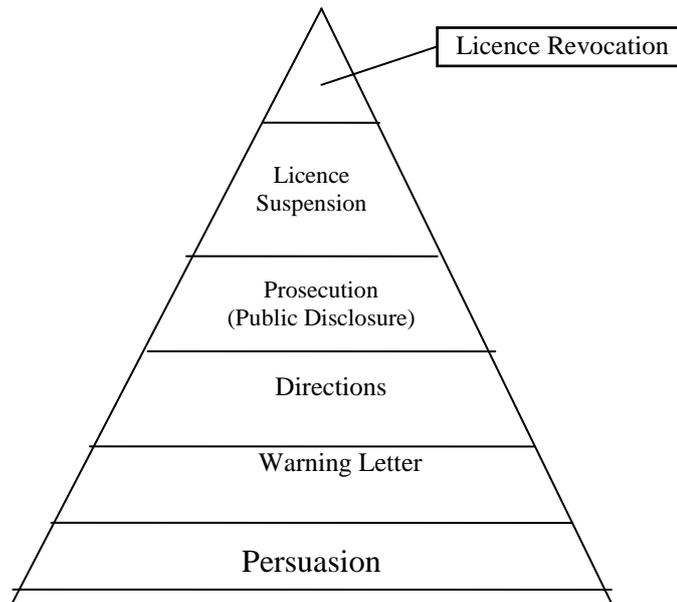
Figure 3. Enforcement Pyramid

(adapted from Ayres and Braithwaite, 1992)

The initial enforcement strategy at the base of the pyramid is to gain compliance through persuading and negotiating cooperative behaviour. If cooperation begins to fail, then enforcement severity is escalated incrementally. It is anticipated that the effect will be to encourage enforcement to remain at the persuasion level with a prevailing threat of invoking more severe sanctions. This strategy is consistent with the horses-for-courses approach discussed under the second tier selection process in Chapter 2; that is, it suggests that companies with high level compliance cultures will be subject to enforcement predominantly at the base of the pyramid, whereas for companies with low level compliance cultures severe sanctioning options further up the pyramid will be available to the regulator.

Such a strategy has been adopted by the Victorian Environment Protection Agency in its law enforcement policy (EPA 1993) and by the Energy Utilities Board in Alberta Canada (AEUB 1996a). Similarly, the Australian Government is currently proposing to adopt this approach for the regulation of safety for offshore drilling and production operations (DPIE 1997b). The exposure draft of this policy strongly advocates the use of a compliance strategy reinforced by formal enforcement sanctions:

> While compliance can be compelled where necessary, safety depends primarily on voluntary adherence by industry to regulatory requirements. Only where the efforts of education and counselling for achieving voluntary compliance have failed, or where there is a clear intentional breach of the regulations, should formal enforcement action be undertaken (DPIE 1997b, p.1).

SEVERITY OF HIGHER SANCTIONS

It is of paramount importance that for such a strategy to work the higher level sanctions on the pyramid are recognised by violators as being severe enough to drive the enforcement action down to the persuasion level of the pyramid. The very fact that big sticks are in place, even though they may never be used, and that their existence is acknowledged by the regulated parties is often enough to encourage cooperative behaviour. The benign big gun regulators (Braithwaite et al. 1987) carrying big sticks are often effective in gaining compliant behaviour while speaking softly.

CONCLUSION

In this chapter it has been argued that other than for self-regulation, the use of appropriate and relevant government enforcement strategies to control and discourage non-compliant behaviour is an essential part of any regulatory strategy. Enforcement of compliance — in the event of non-compliance — can best be achieved through a strategy which encourages companies to voluntarily achieve compliance without the need to resort to sanctions. Success of such a strategy depends on the availability of a hierarchy of sanctions appropriate to the situation encountered which are perceived severe enough and their use considered likely enough in the event of persistent non-compliance. Such a strategy enables regulators to enforce compliance through speaking softly while carrying big sticks.

CHAPTER 4: PERFORMANCE EVALUATION

INTRODUCTION

The OECD Reference Checklist for improving the quality of government regulation (OECD 1995c, 1995d), raises the need for regulatory decision-making to address the following questions:

- Is government action justified? Can regulatory intervention be justified in terms of the likely benefits versus the costs from alternative mechanisms for addressing the problem?

- Is regulation the best form of government action? This requires an informed comparison of a variety of regulatory and non-regulatory instruments. The comparison needs to consider issues such as the ability of the strategy to deliver the required benefits and the costs in terms of both distributional effects and administrative costs to the regulator and the government.

- Is the distribution of effects across society transparent? This addresses the extent to which the costs and benefits of regulatory intervention are distributed across various groups within society.

COST-BENEFIT ANALYSIS

One way of addressing the above questions is through the use of cost-benefit (CB) analysis on proposed regulatory strategies so as to ascertain the relative benefits and costs between the alternatives which may be adopted to address an identified market failure. Currently, governments are showing their concern about the impact of regulation by requiring regulatory impact analyses on proposed regulatory regimes (OECD 1996; Industry Commission 1996; Office of Regulation Review 1995). One of the main steps of regulatory impact analysis is an assessment of the costs and benefits of the proposed alternatives in meeting the regulatory objectives (Office of Regulation

Review 1995, p.B4), that is, a CB analysis. CB analysis entails the elements of the rational choice policy model as described by Davis et al. (1993, pp. 160-63):

- Clearly defining the problem to be addressed.

- Articulating the desired objectives to be achieved in order of priority. In the case of CB analysis the desired objectives relate to the benefits to be delivered by the proposed strategy.

- Identifying all regulatory and non-regulatory alternatives that could be adopted to achieve the desired objectives. These alternatives include the strategies discussed under the first and second tier selection processes described in Chapter 2.

- Quantifying (in economic and/or non-economic terms) the costs and benefits to the government and companies being regulated and the potential distributional effects that these costs and benefits may have on other stakeholders.

- Choosing the alternative which has best optimised a balance between costs and benefits.

In the first two steps it is essential that the problems and objectives are defined and explored through the open and transparent stakeholder consultation processes discussed in Chapter 1.

EFFECTIVENESS AND EFFICIENCY

Whereas an assessment of the benefits of regulation is an assessment of the effectiveness of proposed regulatory alternatives in delivering those benefits, the assessment of the costs of regulation is an assessment of the efficiency of regulatory alternatives. In the context of the discussion presented in this thesis the two integral parameters of effectiveness and efficiency in CB analysis are defined as follows.

Regulatory Effectiveness: The extent to which a regulatory strategy contributes to the achievement of the desired objectives. A regulatory strategy is considered effective if it is demonstrated that it is the major influence in achieving the regulatory objectives and outcomes.

Regulatory Efficiency: Regulatory efficiency is viewed broadly in the context of this thesis, it is viewed as the distributional efficiency of the costs or benefits (financial and non-financial) of the regulatory strategy across the various stakeholders. A regulatory strategy is considered to be distributionally inefficient where the costs or benefits of achieving compliance are inequitably distributed amongst stakeholders. For example, a strategy would be inefficient where it imposes unnecessary costs on other sectors of the community or where its benefits are achieved for one sector at the expense of another. Whereas an efficient strategy is one which results in fair and equitable benefits and costs to the majority of the stakeholders which exceed any direct and indirect costs on other stakeholders. A more narrow view of regulatory efficiency is in terms of the allocative efficiency where the relationship between the direct inputs versus the outputs or outcomes achieved by the inputs is addressed. For instance, an inefficient regulatory strategy from an allocative perspective is one which imposes unnecessary compliance costs on a company which could otherwise achieve compliance at lower cost.

ASSESSING EFFECTIVENESS AND EFFICIENCY

In any CB analysis on regulatory alternatives it is essential that both the effectiveness of the proposed regulatory strategy and its efficiency relative to other alternatives are assessed. For example, effectiveness pertains to the extent to which the regulatory strategy creates a safe workplace or protects the natural environment outside the influence of other non-regulatory influences. The need to evaluate the regulatory influence in isolation from other sources of influence on the behaviour of regulated parties is the main difficulty faced in such evaluations and is often the issue which leaves such evaluations questionable.

Chapter 2 focused on the various regulatory strategies that can be adopted. However, no consideration was given to the relative effectiveness and efficiencies of these strategies in achieving compliant behaviour. This chapter presents the results of some examples of work found in the literature that were carried out to evaluate the effectiveness and efficiency of such regulatory strategies and to present the issues needed to be covered in such an evaluation.

EFFECTIVENESS MEASUREMENT

A common problem in the evaluation of effectiveness is selecting the right indicators to measure the performance outcomes. Blewett and Shaw (1995) highlighted that many performance indicators in attempting to be quantitative and easily measurable leave a lot unsaid about whether performance is about actual improvement influenced by the implemented program or simply a result of luck or measurement of the wrong thing. Many indicators used in OH&S and environmental protection are of very little use for evaluating the effectiveness of regulatory programs in influencing compliant behaviour. As argued by Amis and Booth (1992) in the context of OH&S, which can be assumed also for environmental protection, indicators used to measure performance are of limited use for the assessment of true effectiveness of an implemented regulatory strategy for a number of reasons, including:

- indicators tend to measure failure not success, that is, lagging indicators;
- statistical evaluation of the indicators is often not possible (nor should it be) because the number of accidents is not large enough to make evaluation statistically valid;
- indicators tend to reflect the success, or otherwise, of measures taken some time ago;
- neglect in reporting and analysing the 'near misses'; and
- indicators do not assess the future risk of high consequence/low probability accidents.

A study by Emmett (1995) drew the conclusion that the introduction and enforcement in 1988 of a regulatory Code of Practice for Manual Handling in a Brisbane hospital was the sole influence on the observed reduction in the incidence of back injuries among the nurses there. The evaluation of the effectiveness of this regulatory intervention failed to address the possibility of other changes in the workplace, which may have occurred over the period of evaluation that may have had more primary influence on the improved outcome.

First, the fact that nurses, as rational human beings, were motivated to protect their well-being could have been the main driving force to implement safer work practices in line with those suggested in the code. That is, the absence of appropriate information on manual handling prior to the introduction of the code may have been the cause of injuries not the absence of regulatory enforcement. Therefore, the introduction of the code served to provide information to an otherwise uninformed workforce and the resulting improved outcome resulted from the self-motivation of the nurses to implement these changes in practice and not because of the legal requirements and the threat of prosecution to their employer for not complying.

Second, the hospital was facing increasing compensation costs and insurance premiums as a result of back injuries and was therefore experiencing financial pressure to address this problem. The question, therefore, is whether or not this motive was more influential in reducing the number of injuries over the period of evaluation rather than the increased regulatory intervention.

EXAMPLE: REGULATORY EFFECTIVENESS EVALUATION IN COAL MINES

Emmett (1995) argued that the best known examples of demonstrating the success of regulation as the single influence on achieving desired outcomes are found in the New South Wales and North American coal industries in relation to OH&S. He presented data which shows that in New South Wales before 1943 the coal industry experienced high rates of death through roof falls, explosions and floodings as well as very high rates of black lung among the miners. He showed that since the introduction of strict

regulatory standards in 1943 to deal with coal dust and other hazards, the prevalence of black lung steadily decreased until it was virtually eliminated by the late 1980s. Similarly he showed the figures for North America which showed the virtual elimination of black lung by the late 1980s after the introduction of regulations in 1969. He argued that in countries like China where such regulations are yet to take effect and where mining practices are still poorly controlled, there is still much disease prevalent. Also, the death rate from accidents is some 500 to 1000 times the rate seen in Australian mines. He therefore concluded that regulation alone has been very effective in delivering desirable OH&S outcomes for the coal industry in Australia.

EFFICIENCY MEASUREMENT

The evidence given in the case of the coal mines suggests that the imposed regulations had a positive influence. While this evaluation may have demonstrated the effectiveness of the prescriptive technology and process-based strategy undertaken, it has not addressed the issue of the efficiency of this strategy relative to alternative approaches for delivering the same outcome.

Measuring efficiency pertains to assessing the distribution of costs and benefits (in financial or non-financial terms) among the stakeholder groups and individuals. These groups include:

- the company and/or industry being regulated (for example, compliance costs);
- the regulatory agency and other government agencies (for example, the regulatory resources needed to monitor and enforce regulatory requirements);
- other companies or industries not directly targeted by the regulatory strategy (for example, flow-on costs and benefits);
- other groups, individuals and sectors of the community (for example, those benefiting from cleaner and safer environments and those missing out);
- future generations (for example, the costs to future generations by not protecting the environment today); and
- other stakeholders across national and international borders.

The costs and benefits may be presented in dollar values where possible, such as compliance costs to the company in meeting the regulatory requirements or the savings to the community in terms of not having to rehabilitate a damaged environment or compensate injured workers. The dollar value of less readily valued assets such as aesthetic or wilderness values of the environment can be determined from a number of techniques such as contingency valuation (Mitchell & Carson 1989; Wilks 1990; Bennett 1991) or hedonic pricing (Bennett 1991; Streeting 1990). In these techniques the willingness to pay for preserving environmental values is determined, thus enabling a dollar value to be assigned to these values.

Those costs and benefits that do not lend themselves so easily to the contigency valuation or hedonic pricing techniques may need to be expressed in more qualitative value terms. For example, such qualitative values may be ascertained through the use of opinion surveys or stakeholder consultation through focus groups, workshops and interviews. The expression of such values can be utilised in a multi-criteria analysis (Maimone 1985; Bana e Costa & Vinke 1990) which enables CB analysis to be undertaken either purely qualitatively or in combination with other values quantified in dollar terms.

EXAMPLES OF EFFICIENCY EVALUATIONS

Despite exhaustive literature searches on a multitude of journal databases and other sources including the worldwide web, it was not possible to find detailed regulatory CB analyses. Those analyses which were found, failed to demonstrate the relative efficiency compared with other regulatory alternatives. Any assessment of the efficiency of the regulatory strategy was restricted very much to direct compliance costs to the company and the regulatory agencies with no consideration to the distributional effects as discussed above.

For example, Ackerman and Stewart (1985) cited a range of results from twelve studies into the cost burden generated by C&C strategies adopted to control a wide range of air and water pollutants across North America. These studies indicated that the traditional C&C strategies proved to be up to 400% more expensive than the least

cost regulatory alternatives. These costs related to the actual company compliance costs in meeting the regulatory requirements. It was not clear whether consideration was given by these studies to the costs that may be imposed by the regulatory alternatives onto other sectors of the community and the government. As argued by Latin (1985) these studies neglected to demonstrate that the alternative strategies to C&C could perform effectively in delivering the regulatory objectives. Latin (1985) also argued that the studies failed to account for what he identified to be higher costs associated with the alternative strategies relating to increased government decision-making; bureaucratic delays, inconsistencies and discretion; and opportunities for manipulative behaviour by regulated parties.

The apparent failure of these studies to address the effectiveness and the more broader costs associated with the various regulatory alternatives, including C&C, did not allow a credible comparison to be made. Therefore, the conclusions made in relation to the cost burden of C&C can be misleading and inadequate for an appropriate CB analysis to be carried out.

FUTURE RESEARCH

To address these limitations the SPIRT project will seek to evaluate the effectiveness and efficiency of existing regulatory strategies currently adopted in the upstream petroleum industry in Australia. The aims of the project (FIPPM, 1997) include the:

- examination of the concepts, principles and techniques in the regulation of the natural resources industries;
- identification and analysis of regulatory rationales currently adopted and attempt to reduce them to first principles upon which appropriate regulatory instruments and mixes can be identified for particular purposes; and
- empirical evaluation of the performance in terms of effectiveness and efficiency of various regulatory tools currently utilised in the upstream petroleum industry.

CONCLUSION

Evaluating the performance of any regulatory strategy entails the assessment of effectiveness and efficiency — as defined in this chapter — of the various strategies that may be available for achieving the regulatory objectives. Such an assessment will enable the most efficient of the effective strategies to be selected through the use of cost-benefit analysis.

So far it appears that such evaluation has been very limited in scope and is in need of urgent redress if appropriate regulatory strategies can be selected on a rational scientific basis rather than left to political negotiation and discretion. To realise this it will be necessary that future research such as the SPIRT project focus on the issues of regulatory effectiveness and efficiency, with the latter being addressed in a broader context than direct industry and regulatory agency compliance costs.

CHAPTER 5: CASE STUDIES OF REGULATORY STRATEGIES

INTRODUCTION

In this chapter regulatory strategies adopted specifically in the natural resources industries in Australia, New Zealand and Canada are discussed.

AUSTRALIAN EXPERIENCE

Until recently the regulatory philosophy for the natural resources industries in Australia has been of the prescriptive technology-based C&C type at the State and Territory and Commonwealth government levels. In relation to the petroleum industry, the States and Territories have developed and enforced regulations for all environmental and safety activities as a primary responsibility within their borders. This includes their territorial waters along the coastlines. The primary responsibility of the Commonwealth government is for all environmental and safety of offshore drilling and production operations beyond the limits of State and Territorial waters. This power is governed mainly by the Commonwealth's *Petroleum (Submerged Lands) Act 1967*. Under the Act States and Territories are designated the authority to enforce many of the Act's environmental and safety requirements in their offshore waters. Additionally, for all offshore environmental matters the Commonwealth *Environment Protection (Impact of Proposals) Act 1974 (EPIP Act)* requires regulators designated under the Submerged Lands Act to assess and decide on the level of environmental significance of any offshore petroleum project proposal. Upon a decision that a proposal is environmentally significant, the proposal is then referred to the Commonwealth Minister for the Environment for determination of the level of assessment required. The levels of assessment vary mainly in the extent of public comment and consultation for each proposal.

Need for Change in Regulatory Philosophy

In the early 1990s, a need for a review of the fundamental philosophy of petroleum legislation in Australia was recognised (Laws & Aust 1994). This need stemmed from

the Lord Cullen's recommendations (1990). Laws and Aust suggested that to fulfil Lord Cullen's recommendations a more flexible approach to regulating the industry needed to be adopted, which focused more on the objectives to be achieved and less on the processes and practices of the industry. That is, they advocated the use of PBR rather than the traditional prescriptive technology-based C&C regime.

By 1994, in the case of offshore petroleum safety regulation, reform in the wake of Lord Cullen's recommendations had already commenced both in Australia and internationally. The move towards the adoption of safety cases for offshore safety, instigated by the Commonwealth Department of Primary Industries and Energy (DPIE), was the main objective of the reform process. The next step was to extend this philosophy into environmental regulation of the industry. Through various working groups, the message for the need to adopt PBR for both onshore and offshore environmental regulation of the petroleum industry was being conveyed to regulators and the industry under the aegis of ANZMEC (ANZMEC 1996).

In Australia the focus on PBR in the upstream petroleum industry comes from my observation that petroleum companies in Australia tend to be large high profile companies with long-term ambitions. This observation is based on ten years' experience in the regulation of exploration and development petroleum companies and my extensive involvement with ANZMEC working groups on Australian offshore legislation and with the Chamber of Mines and Energy of South Australia, Mineral Council of Australia (MCA) and the Australian Petroleum Production and Exploration Association (APPEA). Long-term ambitions generate a need for companies to gain the confidence of the government and the community. As a result, they voluntarily commit the resources necessary to achieve regulatory compliance and often seek to demonstrate this compliance to both the government and the community. In response to this, it was recognised by regulators that the traditional C&C regulatory strategies adopted as a one-size-fits-all approach across the whole industry was inappropriate and inefficient. The inefficiency stemmed from government's continuation to take on the responsibility for determining, prescribing and enforcing environmental and occupational health and safety best practice. However, it failed to recognise that in most cases the industry developed and implemented practices that were exceeding the

regulatory requirements. Eventually, the regulatory agencies acknowledged that the petroleum companies being dealt with in Australia tended to be better resourced to develop such practices without the need for the government to become involved at this level. Also, the government prescription often stifled companies in adopting better practices and therefore going beyond compliance. As a result it was considered more appropriate for the regulatory focus to be on the achievement of the regulatory objectives and to leave the means of achieving the objectives to the companies.

Regulation of the mining industry in Australia is beginning to follow the PBR trend but, from my observations, unlike the upstream petroleum industry the size of mining companies is highly variable. Company size ranges from the very small prospective mining companies consisting of a few exploration geologists, through to the large multi-national companies such as Western Mining Corporation and BHP. In the case of the small companies, it can be argued that the incentive to prove up reserves and prospectivity to enhance share prices will be the dominating incentive. Thus committed resources to meet the regulatory objectives tend to be considerably less than for the large companies. As a result there will continue to be a need for C&C strategies where needed in such situations.

PERFORMANCE-BASED REGULATION

In 1996 MESA released an issues paper on the review of its petroleum legislation, which proposed the adoption of a performance-based approach integrated with the requirements for management-systems for regulating the onshore petroleum industry in South Australia (MESA 1996a). A Green Paper was subsequently issued in 1997 reiterating the proposal to adopt this regulatory approach (MESA 1997b). This culminated in legislative drafting instructions (PIRSA 1998a) being prepared and submitted to Cabinet for the approval of the drafting of a Bill for a new South Australian Petroleum Act. In keeping with the philosophy outlined in the issues and green papers, the proposed regulatory regime consists of three basic elements:

- A regulatory focus on the achievement of environmental objectives established on an activity and regional basis. These are to be binding on all companies operating within those regions.

- Environmental objectives, and the criteria for assessing their achievement, are to be established through a public consultation process. Public reporting of performance against these objectives and criteria will also be required.

- Multi-level approval and regulatory scrutinisation of company activities corresponding to the level to which companies can demonstrate they have appropriate and effective management systems and practices in place to achieve the objectives. That is, the higher the degree to which a company can demonstrate the effectiveness of its management systems and practices, the less becomes the regulatory focus on the company procedures and practices. In this situation it is proposed under the new legislation, that companies will be approved as entitled operators. Entitled operators will be allowed to carry out all activities covered by approved regional objectives without specific activity approval.

The third element of this regime is consistent with the model presented in Chapter 2, where the level of regulatory intervention is dependant on the degree of regulator confidence in the company's ability and voluntary motivation to meet compliance with the regulatory objectives. Where such confidence in the company is high, a PBR strategy as proposed in Chapter 2 would be adopted. For the case of low confidence in the company, closer scrutinisation at the operational level to ascertain and enforce appropriate company performance may be required through a C&C regulatory strategy.

At the same time as the South Australian drafting instructions, the DPIE (1998) issued draft regulations outlining the objective-based approach to reform the environmental regulatory framework for the offshore petroleum industry. This was developed in consultation with the State and Territory agencies and industry groups.

The Mining Industry and PBR

A recent study into the regulation of safety in the Australian black coal industry made some observations regarding the regulatory regimes of the Australian mining industry in general (Easson & Creighton 1997). The report stated that despite the shift of regulatory focus of other industries towards more performance-based approaches, the mining industry inspectorate continued to adopt the prescriptive technology-based approach. The conclusion of the report infers that there is an urgent need to review the existing safety regulatory regimes: 'safety in coal mining is regulated in a very old fashioned way, by the application of prescriptive standards (in the context of technology and processes), and not by the duty of care approach which is at the heart of modern safety regulation' (p. 16)

Self-Regulation

There is no evidence in Australia of self-regulatory strategies being used in the regulation of the natural resources industries. However, the mining and upstream petroleum industries in Australia have been proactive in the development of industry-based codes of practice for environmental management. These include the Mineral Council of Australia voluntary code for environmental management released in December 1996 and its handbook on land rehabilitation. Similarly, APPEA in 1977 released (and subsequently revised) a code of environmental management for its members. The intentions of these have been to demonstrate that the industries are genuinely concerned with the potential impact that their activities may have on the environment and that they can implement appropriate measures, independent of government, to ensure appropriate precautions are taken. However, despite these good intentions, such codes are voluntary: as mentioned in Chapter 2, the potential for free-riding within the industry provides little confidence to government and the community that all industry members will genuinely comply.

Environmental Performance Reporting

A recent analysis of Australian environmental reporting practices showed that, unlike many other western countries, Australia's corporation laws and accounting standards

do not require disclosures that specifically relate to environmental performance (Deegan 1996). Also, the analysis revealed that Australian environmental reporting practices figured very low in terms of meeting global priorities and stakeholder information needs. Much of the reporting, including that from companies such as BHP, Boral and Western Mining, was categorised as being of the green glossies, newsletters and short statement in annual report type (Deegan 1996, p. 125), which provided insufficient information to assess environmental performance adequately. Reporting, to be credible and comprehendible to the community, will need to be made a regulatory requirement.

CONSULTATION STRATEGIES

Amongst mining and petroleum regulatory agencies the traditional view of stakeholder consultation was predominantly one of circulating proposals for comment rather than proactively involving stakeholders in roundtable discussions (ANZMEC 1996).

However, the South Australian and the Commonwealth environmental regulation proposals (PIRSA 1998a; DPIE 1998) reflect a change in this attitude through their proposals to implement formal consultation processes which create an open dialogue with stakeholders and ensure the exchange of appropriate information. Similarly, the industry has recognised the need to proactively involve stakeholders in its decision-making independent of government requirements. This is illustrated by the release of a community consultation guideline by the New South Wales Minerals Council (NSW Minerals Council 1997).

NEW ZEALAND EXPERIENCE

Prior to 1991 petroleum exploration and production activities in New Zealand were primarily governed by a Petroleum Act and by regulations and administrative decisions taken under that Act. This regime was subsequently replaced by one which is more functional-specific. Then health and safety responsibilities came under the *Health and Safety in Employment Act of 1993* (HSE Act) and environmental

supervision and enforcement were under the *Resource Management Act 1993* (RMA) (Adlam, 1994).

Powers to levy royalties, issue exploration and production licences, set and modify work programs, enforce land access and compensation for land access or damage for the petroleum industry are all administered by the Ministry of Energy under the *Crown Minerals Act 1993*.

ENVIRONMENTAL PROTECTION

In the case of environmental protection, powers are exercised by the relevant consent authority under the RMA. These consent authorities are largely regional and district councils which are given the power under the RMA to issue consents and permits for petroleum exploration and production activities. These consents and permits include conditions of approval in relation to environmental protection in the form of performance targets (Blakeley 1994). The responsibility for monitoring and enforcing against these standards is also the responsibility of the regional and district councils (Stickley 1994).

The local government authorities with their new delegated responsibilities under the RMA have been left with the problem of how to implement these responsibilities effectively. In response to this problem, many of these authorities have sought the assistance of industry groups and associations to develop principles on the implementation of the RMA and codes of practice to facilitate environmental protection. The Natural Resources Group (NRG), an industry-based association, has proposed the adoption of a set of principles by local councils for administering the RMA. These principles include (Blakeley 1994):

- a clear specification of the desired environmental outcomes;
- the regulatory focus to be on the effects of activities;
- the regulation must be necessary and the most cost-effective; and
- a minimisation of administrative and compliance costs.

A number of councils have integrated these principles into their regional plans where the emphasis has been placed on developing an effects-based plan for all activities. These plans are used as a mechanism for consent-making for specific activities covered by such plans in order to minimise administration and approval times.

Industry associations such as the Petroleum Exploration Association of New Zealand have undertaken to develop and promote environmental performance standards and codes of practice for governing the behaviour of their members. The intentions here are to incorporate these codes and standards into the consent conditions and to leave the monitoring and reporting responsibility to the consent holder (that is, the company). This self-regulatory approach is empowered by Section 58 of the Act. The adoption of this self-regulatory approach has arisen from the New Zealand government's devolution of its regulatory powers to local authorities which are considered to lack the necessary financial and technical resources to police environmental conditions adequately (Stickley 1994, p. 406).

HEALTH AND SAFETY

In the area of OH&S in the mining and upstream petroleum industries the Occupational Safety and Health (OSH) Division of the Department of Labour has devolved its responsibilities under the HSE Act to a group known as the Mining Inspection Group (MIG). Under a memorandum of understanding with the OSH MIG, a self-funding government body within the New Zealand Ministry of Commerce, delivers the OH&S services of the HSE Act to the natural resources industries. The regulatory approach undertaken by MIG is very much risk and management system-based. It focuses on influencing compliant behaviour through the provision of safety information, selecting inspection sites on the basis of risk, management system audits and encouraging industrial self-management of safety through the adoption of approved standards and codes of practice. It also seeks to carry out its activities by full cost recovery from the industry (Leaver 1996a).

According to the manager of MIG the traditional non-risk-based inspectoral culture within the MIG staff when the group was first set up created many transitional

difficulties (Leaver 1996b). Within a relatively short period after the inception of the MIG a significant increase in the number of serious and fatal accidents was observed. An initial reaction to this could be that the MIG focus on risk and management systems is the wrong approach completely and therefore the previous prescriptive safety regulations under the scrapped Petroleum Act should be redeployed. However, as was discussed in Chapter 2, until the cultural requirements under a management-system-based approach are fully understood by both the industry being regulated and the regulators themselves, the relative effectiveness of this approach compared with the previous approach cannot be assessed appropriately.

CANADIAN EXPERIENCE

The regulatory regimes of the National Energy Board (NEB) of Canada and the Alberta Energy Utilities Board (AEUB) are discussed here to illustrate the types of regulatory regimes adopted for the upstream petroleum industry in Canada.

The NEB is the regulatory agency which has jurisdiction over federal energy matters in Canada, including the construction and operation of interprovincial oil and gas pipelines and power lines. The NEB also has powers under the *Canada Oil and Gas Operations Act* (COGO Act) for oil and gas exploration and production activities on frontier lands onshore, and offshore areas not within provincial territorial waters.

The AEUB's responsibility is to regulate Alberta's energy resource and utility sectors from safety, environmental and technical perspective. This includes power generation and supply, pipelines and all upstream oil and gas exploration and production activities in the province of Alberta.

NATIONAL ENERGY BOARD (NEB) REGULATIONS

In relation to oil and gas drilling and production activities the NEB is currently reviewing its regulations under the COGO Act. The activities are regulated by the NEB through the Canada Oil and Gas Drilling Regulations and the Canada Oil and Gas Production and Conservation Regulations. The review is looking at merging these

regulations to form the Canada Oil and Gas Drilling and Production Regulations. This revised set of regulations was circulated to industry in early 1997 for comments. It was anticipated that the revised regulations would be ready by early 1998 (Baker 1997). The merger of the existing regulations was not accompanied by a shift in regulatory philosophy, the prescriptive technology and process-based type of C&C was maintained. The regulations focus extensively on the details of how the industry is to carry out and monitor its operations and activities. For example:

- They require regulator approval of detailed safety and environmental plans which outline in considerable detail all design and procedural aspects of the proposed activity such as specific design features of all equipment; procedures and manuals for operating, maintaining and decommissioning installations and equipment; the training standards to be adopted; and the results of all risk and hazard analyses.

- They outline in considerable detail how certain pieces of equipment are to be constructed, operated, maintained and decommissioned.

- They prescribe the technical standards to which equipment is to be designed, operated and maintained.

The NEBs perception that these new prescriptive requirements will deliver the desired compliant behaviour is encapsulated in two parts in the draft regulations: 'adherence to the safety plan will ensure the safety, health and training of persons on board the installation and preservation of the integrity of the installation (COGDP Regulations 1997, section 33[5]). 'adherence to the environmental protection plan will provide for the protection of the natural environment' (COGDP Regulations 1997, section 33[6]).

As confirmed by the team leader of the Exploration and Production Operations Business Unit in the NEB (Baker 1997b) the regulations are prescriptive, and only for exceptional cases. The NEB has provided an equivalency clause as section 16(1) in the COGO Act to accommodate for cases where 'if an operator could prove that a new technique, standard or code would provide the same level of safety, environmental

protection and resource conservation (as provided for by the regulations) then this could be accepted' (Baker 1997a).

The inherent assumption conveyed in the above statement is that government knows best in relation to safety and environmental protection and that its regulatory requirements will deliver the best outcome.

The responsibility in enforcing these regulations remains solely with the NEB through strict monitoring and inspection of company activities to ensure that they meet the specific regulatory requirements (Baker 1997a).

The strict prescriptive nature of the COGO Act and its regulations has been subject to much criticism by the industry in its comments to the NEB on the draft regulations. Typical comments reported by the Canadian Association of Petroleum Producers (CAPP; CAPP 1997) include:

> It is unclear how the proposed regulations will accommodate new methods, practices and technology.

> With a few exceptions, the regulations are extremely prescriptive, in the style of drilling regulations some 25 years ago. This practice is technically questionable; it creates the potential for regulations to be either too severe or too lax whenever the actual operating conditions fall outside the envelope for which the prescriptive rules have been calibrated.

> There are few instances where the authors (regulators) appear to have grasped the essence of performance-based, non-prescriptive regulatory style.

ALBERTA ENERGY UTILITIES BOARD

In the province of Alberta, the regulatory philosophy for the upstream oil and gas industry differs to that of the NEB. The regulatory approach taken by the AEUB is basically two-tiered (Dilay 1997) and consists of:

- the prescriptive technology and process type for some cases where sensitive issues arise; and

- PBR, used in most cases, where the performance goals or standards are approved and the operator is left with the responsibility for determining the means of achieving those goals.

The main legislation under which the AEUB regulates the industry are the *Alberta Energy and Utilities Board Act, Energy Resources Conservation Act, Gas Resources Preservation Act, Oil and Gas Conservation Act and Oil Sands Conservation Act*.

PRESCRIPTIVE REGULATION

The legislation and regulations under which the AEUB operates are predominantly performance-based (Dilay 1997). However, there are some strict prescriptive elements of this legislation, including upstream petroleum waste disposal (where specific requirements are detailed on the means and locations of disposal) and in the AEUB's pipeline regulations (where specific references are made to the Canadian Standards Association technical codes for design, construction, testing, operation and abandonment of pipelines and for the need to comply to these codes). However, it is important to note that such strict requirements are established through the work of committees which are comprised of a broad cross-section of stakeholders, including community representatives, regulators and industry (Dilay 1997).

PERFORMANCE-BASED REGULATION

As highlighted by Dilay (1997) the AEUB sets approval conditions mainly in terms of goals to be achieved and performance criteria. Subsequent to such approval operators are allowed to modify their facility, production rates and practices without any further approval, within the proviso that the performance criteria set out in the initial approval are met. The focus on the achievement of objectives is also highlighted by the AEUB's preference for facilitating compliance through negotiation and cooperation with the operators, other than for cases of blatant neglect, rather than through the use

of indiscriminate sanctioning without regard to underlying circumstances (Dilay 1997). This approach is documented in the EUB publication on law enforcement (AEUB 1996a), which advocates the model of the enforcement pyramid to gain regulatory compliance (with severe sanctioning to be used as a deterrent to facilitate compliance).

PUBLIC CONSULTATION

The AEUB requires companies to undertake comprehensive public consultation for large and sensitive projects with the intent of seeking input from local people and interest groups on social, safety and environmental issues (AEUB 1996b). The AEUB requires that the consultation process at least involves information packages to the public and holding open meetings to explain the project, obtain input or answer questions. Where objections and concerns cannot be resolved, the AEUB may call a public hearing to consider all points of view.

In response to the requirement by the AEUB for public involvement in major and sensitive projects, the CAPP has made a commitment on behalf of its member companies to be proactive in community consultation. This commitment resulted in the development of its Public Involvement Guidebook (CAPP 1995) which comprehensively details for member companies the why, when, how, and who to consult with when developing a public consultation plan and process, including the issues to consult on. The guide acknowledges that consultation is more about process than about the project because groups are often likely to 'buy-in' to the process but not to the project. Therefore, it is essential for a company to reach a clear and early dialogue among all stakeholders to delineates the process, respond to requests for guarantees, identify shared impacts and shared benefits, establish a mutual definition of fair and determine what issues are on the agenda (CAPP 1995, p. 6).

CONCLUSION

From much of the evidence presented in this chapter it appears that considerable attention is currently being given to the way the mining and upstream petroleum

industries are being regulated in relation to environmental and health and safety issues. It is evident that the traditional command-and-control (C&C) approach is being questioned with respect to its effectiveness and efficiency and as a result other options, mainly performance-based (PBR) and management-system-based approaches, are starting to figure prominently in what could be considered as a "re-regulation" trend in these industries.

The attitude of these industries towards HS&E protection appears to be changing to one which is more pro-active in responding to regulatory issues. The adoption of voluntary Codes of Environmental Practice, environmental reporting and community consultation initiatives by the industry are all strong indicators of this changing attitude. With such a change in attitude comes a change in culture and hence a need for a change in the way these industries are regulated. The need for changes in the regulatory philosophy should not however be interpreted as a universal need to dispose of C&C or to adopt self regulatory initiatives. Instead it demands for a means upon which the most appropriate regulatory strategy, including C&C and self regulation, can be selected. Such a means, as proposed in Chapter 2, must be embraced by regulatory agencies to ensure that appropriate regulatory strategies are adopted which can effectively and efficiently facilitate the achievement of the regulatory objectives.

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