



REGULATORY SYSTEM

INTRODUCTION

The studies in this area comprised not only a comparative review of the regulatory regimes of other jurisdictions having offshore industries, but also an examination of the philosophical bases underlying the various approaches to regulatory control.

The Session was chaired by Dr. J.E. Hodgetts, an eminent political scientist and Rhodes Scholar whose teaching career spanned many years at the University of Toronto and Queen's University, with Visiting Professorships at Northwestern, Dalhousie, and Memorial Universities. A Fellow of the Royal Society of Canada, Dr. Hodgetts holds honorary degrees from Mount Allison, Memorial, and Queen's Universities, and has been Editor of the Queen's Quarterly. He currently edits the Canadian Public Administration Series for the Institute of Public Administration of Canada. Dr. Hodgetts is a Past President of the Canadian Political Science Association, and has served on a number of advisory committees, both nationally and internationally. He has written numerous articles and books on Canadian government and administration and served as Editorial Director of the Glassco Commission on Government Organization (1960-1962) and as Commissioner on the Lambert Commission on Financial Management Accountability (1976).

The organization of this Technical Session differed from the previous Sessions in that it did not include any invited commentaries. Instead, the Session consisted of presentations from four panelists who then discussed their presentations as a panel without participation from the Conference floor; the general discussion involving the Conference participants followed the panel discussion.



Mr. I. Manum
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Norwegian Maritime Directorate

Mr. Manum graduated from the Norwegian Institute of Technology in 1959 with an M.Sc. in Naval Architecture and Marine Engineering. Since 1969 he has been with the Norwegian Maritime Directorate, and for the last 12 years he has directed the department dealing with hull, machinery, and offshore structures. In this position he has been involved in the investigation of all major incidents of Norwegian ships and rigs. He is also the Norwegian representative on the IMO Maritime Safety Committee.

PAPER H1

A Control Regime and Structure for Effective Maintenance of Operational Safety

INTRODUCTORY REMARKS

Proposed changes in international offshore safety codes in order to improve upon safety are often met with requests for more statistical data that could justify such changes. Even proposals for a start of constructive discussions have been met with the same argument. The practical consequence of such arguments is that we wait for more casualties to occur in order to be convinced. I will assume that both Canada and Norway have had the serious accidents necessary to be convinced of the need for improvements. In addition to the *Alexander L. Kielland* and the *Ocean Ranger* accidents, both the Canadian and Norwegian administrations were involved in the blowout incident on the *Vinland* earlier this year. Although during the incident that unit was evacuated in an orderly and safe manner, the blowout could easily have developed into a serious accident if the gas had been ignited. Therefore, the initiative taken by the the Royal Commission on the *Ocean Ranger* Marine Disaster to hold this conference is highly appreciated by all concerned. The main question before us is: "What is the most effective regulatory regime to ensure that human safety is maintained in offshore drilling and production, including service and supply?"

Before trying to answer this main question, I should like to express my opinion on several topics that could be of some interest. What are the main professional skills involved with the offshore activity in the conceptual, design, construction, and operational phase?

In my opinion the skills needed are primarily traditional, landbased hydrocarbon drilling and production technology and maritime technology (marine engineering, naval architecture, and the nautical profession) and the co-ordination of these.

It is often stated that the offshore industry falls under the umbrella of "fast advancing technology" and that the industry is working on the frontiers. I can accept such a statement regarding the geological part of the technology, but I hesitate to accept it for other parts of the industry. Consider, for example, lifesaving appliances, ballast systems, drill floor equipment, mud systems, testing equipment, etc. In my opinion the technological development in modern shipping has been just as advanced, perhaps even more. In that business, new ways of

carrying cargo have been developed and therefore the main characteristics of the ships involved have changed dramatically during the last decade. In order to make them cost effective, those ships are today highly automated and have small crews.

Consider, for example, the design of the semi-submersible, which is the supporting structure of many drilling rigs and accommodation units. That design entered the maritime scene some 20 years ago, when drilling and production expanded into areas of deeper water and a harsher environment. Since then, however, the basic design principles have remained more or less unchanged. Personally, I cannot foresee a fast development of those design principles in the years to come. Further, mobile offshore units (MOUs) are subject to the same environmental forces and conditions which seamen have had to contend with for centuries and which have been the base for marine engineering and naval architecture.

The main question at this conference which I quoted above, seems to be linked primarily to safety offshore eastern Canada. It should, however, be borne in mind that the mobile offshore units (MOUs) carry flags and are transferred from one continental shelf to another. Therefore, international agreement on standards is needed.

REGULATORY REGIME

Responsible Authorities

I believe it would be in the interest of safety if the responsibility for human safety and the encouragement for development of the industry itself were given to two separate governmental departments. However, this is not a very important point, at least not in Norway, because there the government will have the overall responsibility anyway. The number of responsible authorities will depend on what expertise is available within each national administration. In this regard, the two different technologies, oil technology and maritime technology, should be borne in mind. When Norway went into the offshore oil activity, we had no landbased oil drilling and production technology within our national administration. According to the promising results from the North Sea, it was apparent that this activity would become a major part of Norwegian industry in the future and a new and separate directorate, the Norwegian Petroleum Directorate (NPD), was established.

With regard to maritime matters, however, Norway had an established administration and a regulatory regime based on the established regulatory regime for traditional shipping, that also could be applied to the off-

shore oil industry. Therefore, the Norwegian Maritime Directorate (NMD) issued regulations for mobile offshore units. In doing so we took account of the special characteristics of the MOU-design, especially the semi-submersible design.

In carrying out this task, NMD cooperated with other governmental bodies in areas where NMD had limited expertise itself, and for practical reasons some regulatory work and inspections have been delegated to recognized classification societies.

When the responsibility for overall system control is combined with the lack of resources within administrations, there is a danger that the professional skill within each separate technological area is so reduced that the responsible authority becomes "a paper tiger". Therefore, the authority should select some professional areas on the basis of paramount importance to safety, not self-regulation or novelty. Within such areas as, for example, damage stability, lifesaving appliances, and dynamic positioning systems, the administration should carry out a thorough evaluation of the solutions proposed by the industry.

Regulations should preferably give broad objectives and not specify the required means of meeting them. Such means would better be dealt with in guidance notes that could be amended without too much difficulty according to safe practice and industrial development. But the responsible authority must make sure that a minimum level of safety is established. In order to judge the risk associated with various combinations of construction and operational means that would result in a flexible system, trustworthy risk analyses are needed. In my opinion neither the industry nor the authority has the data needed to conduct a quantitative, overall risk analysis. Therefore, mandatory, minimum standards are still needed in some areas of vital importance to human safety. At the same time, risk analyses should be applied to a larger extent to gain experience with the risk analysis technique.

It would be an advantage for all parties involved to know the "rules of the game". It is then easier to make sure that the standards are met, and it allows industry to calculate consequences before starting up an offshore activity. It is argued, however, that this would prevent development within the industry, because there would be little or no room for new solutions. In my opinion, mandatory "rules of the game" should specify the minimum standards, and flexibility should be provided for in the regulations by paragraphs stating that any solution which provides an equivalent level of safety should be accepted.

Development of Regulations

The objective of a regulatory regime is to limit the loss of lives in connection with the offshore activity. When developing regulations, there are two main principles:

1. The identification of factors initiating accident development and elimination or control of those factors;
2. The introduction of means to limit consequences by setting standards for a technical concept or for operational factors, in situations where initiating factors exist.

Overall Responsibility and Control

According to the policy of the Department of Shipping and Commerce which has been adopted by the Norwegian Parliament (Stortinget), the NMD will gradually change its control regime. The object of this policy is:

1. To guarantee co-ordination of safety control in all phases;
2. To provide an overall control;
3. To reduce the involvement of the administration in the control of some details;
4. To reserve the resources of the administration for more overall and total control;
5. To take full benefit of the resources of all parties involved;
6. To achieve continuity in the safety work;
7. To provide the administration with a tool for continuous evaluation of the safety regulations;
8. To improve safety standards.

As a first step in this change of the control regime the administration intends to transfer the detailed control in some control areas to the owners as a part of their internal control. The administration will retain overall supervision of the control procedures and their application and will correct them as necessary.

International Co-operation

Mobile offshore units, including drilling units, crane barges, diving support vessels, accommodation units, etc., and supply vessels, are today all transferred from one continental shelf to another from time to time. Some types of units are transferred more frequently than others. For the benefit of the industry, regulatory authorities should provide for easy acceptance of MOUs moving from one continental shelf to another. In order to maintain safety of human life, however, it is important to establish common agreement on uniform principles and minimum standards. The ultimate goal could be a convention with requirements on minimum

standards for world-wide operation, with additional requirements for special areas or zones with harsh environmental and/or special conditions. The international body for agreements like this is the International Maritime Organization (IMO). Good progress has already been made regarding supply vessels and diving systems, but the IMO code for mobile offshore drilling units is still inadequate. It has not taken proper account of the special characteristics of the MOU design and operation in comparison with ship design and operation.

I hope that this conference will lead to more constructive contribution and more progressive work from all members of IMO who have relevant offshore experience.



Mr. G.L. Hargreaves
Former Consultant
U.K. Department of Energy

Mr. Hargreaves, after a 28 year career serving the Royal Navy as a Dockyard Officer, worked in a number of positions in the British public service. Following retirement, he worked for 7 years as a Consultant to the Petroleum Engineering Division of the Department of Energy, where he was instrumental in establishing the Offshore Installations Technical Advisory Committee which drafted the technical and legislative guidance on design and construction of offshore structures.

PAPER H2

A Control Regime and Structure for Effective Maintenance of Operational Safety

INTRODUCTION

This presentation describes the development of measures taken to ensure the strength, stability and seaworthiness of offshore installations in sea areas under British control. Offshore installations are here understood to be the structures, fixed and mobile, that provide a platform for the petroleum related equipment associated with the exploration for, and the exploitation of, underwater petroleum products, for handling and storing those products, and supporting living and working accommodation for the operating crews; most petroleum related equipment and its operation is controlled by separate legislation. But the principles and practices described below are also applicable, in appropriate degree, to other technical legislation.

LEGISLATION

Acts of Parliament

Offshore safety, like other industrial legislation, must be based on the firm foundation of an Act of Parliament, in this case the *Mineral Workings (Offshore Installations) Act* of 1971 (subsequently supplemented by the *Pipelines and Submarine Pipelines Act* of 1975 and the *Oil and Gas Enterprise Act* of 1982). The preamble to the 1971 Act reads:

An Act to provide for the safety, health and welfare of persons on installations concerned with the underwater exploitation and exploration of mineral resources in the waters in or surrounding the United Kingdom, and generally for the safety of such installations and the prevention of accidents in or near them.

At the time this Act was being drafted it was possible only to speculate on the future size and complexity of the offshore industry; the nature of many of the technical problems had yet to be identified, let alone quantified, and even known hazards could develop unexpected complexities. In these circumstances legislation was drafted as an "enabling Act", which authorised the Secretary of State for Energy to prepare regulations as and when the situation became clearer, when needs had become evident, and when the necessary technical data had been prepared. Regulations can be framed only to meet ends clearly defined in the

authorizing clause and subject to any specific conditions laid down in the Act. Parliament and the courts keep a jealous eye on such delegated powers and a Minister who exceeds his authority can find himself in embarrassing trouble!

However, the Secretary of State was given specific authority to make regulations requiring every installation to have a *Certificate of Fitness*, to be granted only after such survey, inspection and testing as might be prescribed. He was also empowered to appoint authorities to apply the regulations and issue certificates. A duty to comply was laid on the owner of an installation, the manager and the concession owner under pain of prescribed penalties, with regulations made under the Act.

Regulations

Unlike Acts of Parliament, which can only be amended by another Act with all its attendant procedural delays, regulations can be altered and amended with less difficulty should the need arise – an advantage when dealing with rapid change.

A safeguard in the 1971 Act requires the Minister to consult with the industry before making regulations but without requiring him to take the advice tendered. In fact consultation took place with the appropriate technical committees of the United Kingdom Offshore Operators Association (UKOOA), where engineer talked to engineer and specialist to specialist and very early on all concerned, realising that their eggs were in the same basket, adopted the un-written principle, "convince or be convinced". Mutual confidence grew rapidly at the corresponding professional levels, to the advantage of both sides.

Made in February, the *Construction and Survey (Offshore Installations) Regulations* came into operation on 1 May 1974. These regulations provide the effective legal backing for ensuring the safety of offshore installations; they set down objectives but do not specify means of achievement. Clause 3 sets out the fundamental requirement that as from 31 August 1975 no installation might enter, or remain in, British waters unless there exists in respect of that installation a *Certificate of Fitness* issued by an approved Certifying Authority. (Certifying Authorities are dealt with in the Section on Enforcement below). Subsequent clauses prescribe the drawings, calculations and other data that must be submitted with any application for a *Certificate of Fitness*; also the access and other facilities that must be afforded to representatives of the Certifying Authority.

Regulations require the Certifying Authority to make a comprehensive and independ-

ent assessment of the whole process of design and construction before deciding that a *Certificate of Fitness* can properly be issued. Certificates are normally valid for five years, subject to satisfactory annual surveys, but may be for a shorter period, and subject to such other qualifications as the Certifying Authority may deem necessary in the light of their assessment. Separate clauses detail the procedures to be followed in the event of alterations, damage, and deterioration. Annual and five year major surveys are prescribed to ensure that an installation remains fit for its purpose; but a continuous survey is also acceptable. These surveys must be carried out under the supervision of, and subject to the approval of, the Certifying Authority. The method of calculating maximum fees that may be charged is set out in special Schedule of the regulations.

Schedule 2 of the regulations is devoted entirely to the technical assessment that must be taken into account by designers and Certifying Authorities. Part I contains definitions and Part II to VIII deal in turn with: environment, foundations, primary structure, secondary structures, materials, construction, and equipment (that is mechanical and electrical equipment associated with the installation itself and not including petroleum associated equipment).

Part II lists the environmental forces to be taken into account and contains the important stipulation that minimum conditions shall be not less severe than those likely to occur not more than once, on average, during any period of 50 years. Parts III to VIII prescribe performance criteria, specifying minimum standards to be achieved in design, materials and construction. Appropriate clauses deal with site investigation, afloat stability, sub-division, and watertight integrity. Part VII, construction, prescribes supervision, material control, quality control, and fabrication techniques, all to be to the satisfaction of the Certifying Authority.

Regulations, like Acts of Parliament, must be written in legal language by a legal draftsman because they should ideally be understood and interpreted in exactly the same way by all lawyers and judges. Engineers and legal draftsmen, each a layman in the other's field, invariably tend to oversimplify the other fellow's task. Each believes he knows exactly what the other is saying and usually both are wrong! Time and patience are well spent getting things right at this stage.

Guidance Notes

Non-statutory documents, not backed by law, are not properly included under legislation but they have been included here

because they are intimately linked with the regulations. Simultaneously with the publication of the Construction and Survey regulations, the Department of Energy published, *Guidance on the Design and Construction of Offshore Installations*, 1974, the "Green Book". An 80 page loose leaf book in a ring binder cover, the Green Book was produced in a hurry to meet a need, namely to provide a standard for use by designers and Certifying Authorities in the application of the new regulations. Arranged in sections, Sections 2 to 8 corresponding with Parts II to VIII in schedule 2 of the regulations, the Green Book took the form of a designer's guide, containing information, references to codes of practice and other published material, recommended factors of safety and other information relevant to design and construction. On the advice of their specialist advisors (see section on OFINTAC below) the Department of Energy believed that, applied with judgment by experienced engineers, the Green Book recommendations would meet the requirements of the regulations.

As stated, the Green Book was prepared in haste, against a deadline, and the loose leaf form was adopted to facilitate the amendments that would undoubtedly be needed in the near future. In fact, experience and research results came so fast during the next few years that the department did not amend the Green Book but, instead, brought out a second edition, the "Blue Book" in 1977. In addition to up-dated material in all sections the new edition was nearly 50% larger, consisting of 116 pages, and incorporated enlarged sections on fatigue, helicopter decks, and fire resistant construction as well as completely new material on noise and vibration.

Following the useful precedent described in Regulations under the Legislation section, the content of the Blue Book was also discussed with UKOOA, inter alia allowing the industry to comply with the revised recommendations even before publication. The second edition was well received by the technical press as being better arranged and more useful than its predecessor.

Certifying Authorities and designers are not obliged to comply with non-statutory Guidance Notes but, as one writer observed, "... if an owner complies with them, it goes a long way to establishing that he is acting reasonably." No significant problems have, in fact, arisen. Using the loose leaf amendment system the Blue Book has continued in use to the present day. (A third edition, incorporating all seven amendments so far issued and a new section on fatigue, was published at the end of July 1984.) Owners, designers, and Certifying Authorities may, at discretion, disregard

the Guidance Notes when later or better data becomes available, so allowing maximum flexibility in the application of new techniques.

TECHNICAL

Offshore Installations Technical Advisory Committee

During the early offshore years the Department of Energy realised the need for a wider range of technical knowledge than was available in the department, or, indeed, within any one department of government. To meet this need a special group was established, the Offshore Installations Technical Advisory Committee, or OFINTAC as it rapidly became known. To this small but powerful group were nominated representatives from the:

- Meteorological Office
- Institute of Oceanographic Sciences
- National Maritime Institute
- Hydraulics Research Station
- Building Research Station (soil mechanics, foundations)
- Naval Construction Research Establishment
- Marine Division, Board of Trade (seamanship, marine safety)
- Department of the Environment (civil engineering, steel, concrete)
- National Engineering Laboratory (metal fatigue)
- Department of Energy

Each representative was a specialist of standing, some of international reputation, and in addition, each could call upon the resources of his parent organisation. The writer, with maritime civil engineering background, was appointed to lead this group, with a primary directive to ensure the "Strength, Stability and Seaworthiness of Offshore Structures". Secretarial services were provided by the department.

OFINTAC met regularly once a week, meetings usually lasting all day. Some of the meetings were held at the headquarters of an organisation providing members, giving the 'home' members an opportunity to demonstrate the extensive resources available. In addition, members visited operational offshore installations and construction yards in UK and in other countries. This close, continuous association between site and laboratory, engineer and scientist, master mariner and 'boffin', led to each member gaining an appreciation of the problems and resources of his fellows, and promoted the rapid growth of a group identity with all members contributing to all discussions, not merely the specialists most closely con-

cerned. This attitude proved invaluable. OFINTAC operated on the sound principle that in an on-going situation today's problems must be solved with today's knowledge and resources extrapolated only as far as professional judgement allowed; a concept long familiar to engineers and seamen. The scientists coupled their agreement with strong recommendations for further research where necessary, leading, inter alia, to three additional weather ships being stationed in the surrounding seas and to invaluable fatigue data following full scale tests on large tubular joints. OFINTAC was mainly responsible for the technical input to the Construction and Survey Regulations and to the Green and Blue Books. The group also carried such specific tasks as were referred from time to time and recommended research proposals to fill gaps in knowledge or verify assumptions.

Once the Blue Book had been launched, OFINTAC considered that their primary tasks had been accomplished and sought discharge from its responsibilities. This was approved by the Secretary of State and the group was disbanded in 1978. It was a privilege to have been associated with so able and hard working a body.

Research

During the earlier years offshore research was carried out under the auspices of the Ship and Marine Technology Research Board. Once approved, a project was placed out to contract with an appropriate research organisation or private consultant. A project officer was appointed (each project officer usually handled four or five contracts) whose duty it was to keep in touch with expenditure and progress, and submit periodic reports to the board. At a later date the Department of Energy assumed responsibility for its own research but no changes were made to the contract system and project officer control. In due course the Technical Head of the research organisation was co-opted on to OFINTAC, keeping that group in continuous touch with the status of relevant research contracts. Important projects in which OFINTAC had an interest included the additional weather ships in the seas surrounding UK; the NOR-SWAM project, a mathematical wind and wave model based on hind-casting, used to predict extreme and other sea state conditions in the North Sea; and the British Offshore Steel Research Project, which included full scale fatigue tests on large tubular joints and provided new data on scale effects.

ENFORCEMENT

Certifying Authorities

Under the 1971 Act the Secretary of State is authorised to appoint Certifying Authorities and empower them to issue *Certificates of Fitness* after being satisfied, by comprehensive and independent assessment, that the design and construction of an installation complied with the regulations. Consideration was given to the possible appointment of the five principal Ship Classification Societies operating in the UK, namely:

- American Bureau of Shipping
- Bureau Veritas
- Germanischer Lloyd
- Lloyds Register of Shipping
- Norske Veritas

Large reputable maritime organisations, effectively non-profit making, they are accustomed to competing with each other for business. Each possessed a world wide organisation of representatives and agents, able to take in their stride the testing and identification of materials and equipment and the supervision of construction and repairs. This was particularly important, as the oil industry is nothing if not international. When approached, all five societies expressed the belief that they had the resources and the staff to undertake the work, but stipulated that the Department of Energy must set the standards to be achieved, hence, the need for the Green and Blue Books! Before appointment, each organisation submitted to detailed inspection of its financial and technical resources and in a majority it was found necessary to stipulate that additional specialist staff be appointed in the fields of civil and structural engineering, soil mechanics, foundations, and reinforced concrete. In every case the societies concerned willingly complied. At a later stage a sixth organization, a consortium of consulting engineers and naval architects, Halcrow, Ewbank and Associates Certification Group, was appointed.

The oil industry is always in a hurry and design is usually only a jump ahead of construction. The Certifying Authorities have found little difficulty in accepting this situation and maintain close liaison with design and designers right from the start; differences are detected and settled as they arise instead of coming to light later to cause delay and disruption.

Petroleum Inspectorate

Clause 6(4) of the 1971 Act empowers the Secretary of State to appoint inspectors to assist him in the application of the Act. At

present the Petroleum Inspectorate consists of a small group of petroleum, civil, mechanical, and electrical engineers and occupational safety experts; a former Head of the Structural Branch is, at present, Head of Safety. (Other Inspectorates, operating under separate legislation, deal with diving and with pipelines.) Inspectors carry out regular inspections both offshore and at construction sites during building. A primary objective is to check that the certification system as laid down in the regulations is operating as envisaged and that all stages of construction and maintenance receive the required independent oversight. The Inspectorate is also interested in the continuous and periodic surveys laid down in the regulations and in training. Periodic meetings are held with the Certifying Authorities, both individually and separately, to review experience gained, deal with problems that may have arisen in the application of the regulations and ensure that all Certifying Authorities maintain equivalent standards. Periodic discussions also take place with appropriate departments of foreign governments having interests in the North Sea and adjoining sea areas, again with a view to harmonising control practices and requirements to the maximum degree practicable.

Every few years an inter-governmental Conference of Safety and Pollution is held to review the progress and recommendations of working groups established with a view to harmonising design requirements on working conditions. For example Working Group I, consisting of specialists from France, Norway and UK, was made responsible for preparing and keeping up to date agreed environmental design criteria for the whole of the sea areas of the North West European continental shelf. The Inspectorate plays a major part in these conferences.

Since OFINTAC was disbanded, the Petroleum Division Five, which includes the Occupational and Safety Inspectorate, has assumed responsibility for up-dating the Blue Book, seeking specialist advice as necessary and arranging for the now well established voluntary discussions with the industry.

These paragraphs do not pretend to give a comprehensive picture of the Inspectorate as they ignore the continuing mass of administrative duties, consultations with other government departments, and dealing with the inevitable day to day problems.

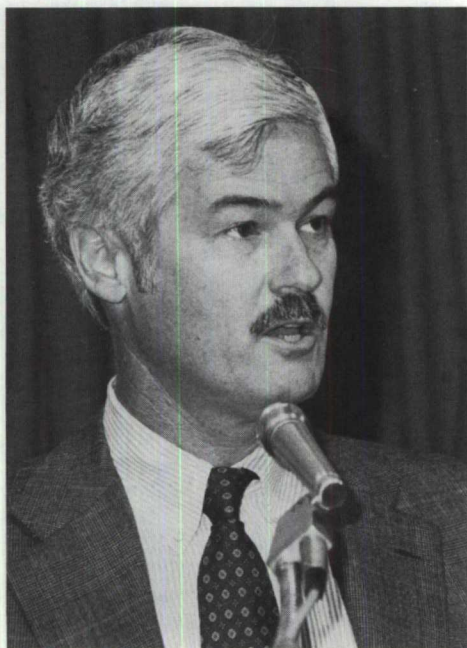
CONCLUSIONS

On the basis of ten year's operations this presentation submits that the measures devised to ensure the strength, stability, and seaworthiness of offshore installations in

British areas have achieved their objectives and represent, if not the ideal, at least a workmanlike compromise between the two extremes of 'self-governing' and 'totally prescriptive'.

Subject to the specified minimum standards being achieved, no constraints are placed on owners, designers, and Certifying Authorities and owners may select the Certifying Authority of their choice. Further, the obligations placed on owners requiring comprehensive independent checks on design, construction and periodic surveys are little, if at all, more than those that would normally be assumed voluntarily by a prudent owner to preserve the lives of his employees and protect his investment.

But no man can afford to be complacent when dealing with the sea.



Mr. T.S. McIntosh
Executive Vice-President & Chief
Operating Officer
Zapata Corporation

Mr. McIntosh holds a degree in Mechanical Engineering from Rice University and an M.B.A. from Stanford University. Prior to joining Zapata Corp., Mr. McIntosh worked with Tenneco Oil Co. in various management capacities. With Zapata he is currently Executive Vice-President and Chief Operating Officer, and in 1984 he was also elected to the Board of Directors. Mr. McIntosh is a Past President of the International Association of Drilling Contractors and in 1983 was Chairman of the Symposium on Safety of Life Offshore which was co-sponsored by IADC and the Scripps Institute of Oceanography.

PAPER H3

A Control Regime and Structure for Effective Maintenance of Operational Safety

The proper relationship of government regulation and offshore activity is not a new subject for the International Association of Drilling Contractors (IADC). Back in the late '70s, for example, we worked closely with the United States Coast Guard to develop the U.S. flag MODU (Mobile Offshore Drilling Unit) code. We have considered the matter continuously since then. Industry-government relations were, in fact, the subject of one complete session of the Symposium on the Safety of Life Offshore which was held last summer in California. At that conference, which saw participation from both Americas, as well as Europe, we discussed many of the same matters being considered here in St. John's. The conclusion made at the Symposium was that the interests of safety are best served when government and industry work closely together. This conclusion was echoed last fall by the Offshore Safety Task Force of Canada's East-coast Petroleum Operators' and Arctic Petroleum Operators' Associations. In their report on offshore safety they noted that:

Resolution of safety concerns requires a concerted effort of co-operation and communication within the industry and between industry and government (1).

I wholeheartedly endorse the idea that effective and realistic regulations can only be arrived at when industry and government work hand-in-hand. But let us take the concept a step further. The stress has to be on the word "realistic". Safety regulations can only be effective if they deal with real-world situations in a reasonable way. First and foremost, we must resist the impulse to regulate purely for regulation's sake. Nor should regulations be used as a club against business. I am not delivering a diatribe. This sort of thing does happen.

In her book, *The Apocalypitics*, Edith Efron documents the way that some leaders of the scientific community, who are philosophical hostile to business in general, have systematically shaded facts to "prove" cancer in humans stems principally from industrial causes. Yet the most thorough study of the subject indicates that only a very small fraction of human cancers, maybe five percent, can be directly attributed to industrial chemicals (2). Here is a telling quote from Efron's book that distills this hostile attitude toward business:

The notion [is] that the essential problem of 'regulatory' science is a

conflict between good and evil, between regulators who seek selflessly to protect our lives and businessmen who seek selfishly to kill us all (3).

That is an extreme statement, but we should recognize such an attitude exists. We must be very cautious not to let it creep, however subtly, into the regulatory process.

We also have to be very cautious about the "high-tech" approach to safety regulation. In the wake of both the *Alexander Kielland* and *Ocean Ranger* disasters, we heard a cry for gadgets, redundant systems, and electronic cures of all sorts. But could they have prevented either mishap? The *Alexander Kielland* was built under one of the most stringent regulatory regimes in the world, yet human error in the shipyard caused the sinking. Offshore rig design was clearly equal to the storm that claimed the *Ocean Ranger*, because both the *SEDCO 706* and the *Zapata Uglund* came through the same blow without incident. Again, it appears human error was at fault. In these two cases at least, better training is what we needed, not better technology. The economic forces that drive the petroleum industry ensure that every offshore operator will seek the best available and safest technology, just to remain competitive. This is what I mean about realistic solutions to real-world problems. If you are going to write regulations that work, and that do not strangle industry in the process, then you must have a detailed knowledge of the industry you are seeking to regulate.

Unfortunately, it is not unusual for governments to rely on the opinions of unqualified experts. A co-operative working arrangement between government and industry can provide the operational expertise needed to draft effective regulations credible to all concerned. This is not to imply that there have not been some sincere efforts to gain industry advice regarding the Canadian offshore, but often regulators went to the wrong people. They talked to the oil companies, but not the drilling contractors, and those are two very different businesses. Earlier this year, for example, a group of oil company executives met under the auspices of Texas A & M University's Sea Grant Program to discuss offshore safety. What was their conclusion? Here is an excerpt from a report on the conference:

Offshore in the oil patch, most producers blame their contractors for any problems that may exist, although the larger oil companies differ among themselves as to how serious the problem is (4).

Needless to say, we, the contractors, take exception to that conclusion. My point is that offshore drilling companies are part of

the oil industry, but they are different from oil companies. This is a critical distinction, but few people make it.

There are many concerned and very able individuals working in government today. Not many, however, unless they have retired from the industry, can claim the detailed understanding of offshore activity that our workers have. Government must have the expertise of industry to do an effective job of regulating industry. What then, is the proper role of government? I am sure a few people in this room today would have some interesting answers to that question. But the question is a fair one, and deserves a fair answer. A narrow definition of the role of government in offshore activities was given by the Marine Board of the National Research Council in Washington in a recent publication entitled *Safety Information and Management on the Outer Continental Shelf*. The government's role, they said, is to:

Motivate industry to conduct operations safely, to disseminate information, and to foster the development and application of technology that will improve the safety of OCS operations (5).

I agree with that, but I think we need to take a broader view. Government has a responsibility to look to the bigger picture. Business must, of necessity, concentrate on specific tasks. Government has the task of pursuing the greater good for all of the people. The problem comes in sorting out this mandate and balancing the demands of differing interests.

I think most of us in the offshore industry agree that early pressure from provincial authorities to employ local residents, while understandable and applicable in certain activities, was probably a mistake. There is no question that this practice can lead to poor results in areas where a number of years and experience is needed. There was really no need to force the issue, because the economic facts of our business dictate that drilling contractors operating in foreign waters begin to employ local residents as quickly as possible. The expense of transporting entire crews across a continent or an ocean is prohibitive over the long term. A good example of this process is the *Zapata Scotian*, which started working off Sable Island two years ago with a largely U.S. crew. Today, the *Scotian's* crew is 91 percent Canadian. Happily for us, more than half the Canadians we hired already had at least some offshore experience. But for those that did not, it has taken fully two years to bring them up to snuff. And this is a better track record than we find in the U.S., because our Canadian employees are generally better educated, have better work records and are more serious about their

work. But the process takes time, in this case, two years. Because the offshore industry is so new, you cannot hire a full complement of rig-wise personnel off the street. And when you are working with very expensive and complex equipment in difficult and even dangerous environments, you run a great risk if you are forced to use unseasoned people. This risk can be avoided if there is a mechanism in place that enables government officials and offshore operators to work together to achieve common goals. Such a mechanism is not a pipe dream. There are several good examples we can point to right now.

One is the Panama Offshore Industry Committee. Let me share with you a comment by Doctor Hugo Terrijos Richa, Director-General of Consular and Maritime Affairs for the Republic of Panama. He says the Panama Offshore Advisory Committee has provided the industry:

the opportunity to participate in the early stages of development and implementation of all kinds of regulations and requirements, and has also provided them with an excellent information channel on all the maritime administration activities. At the same time, the committee has permitted the administration to benefit from the vast pool of know-how and experience represented by the [industry] (6).

Why did Panama need industry input? They already had considerable experience with maritime affairs. They sought industry advice because they recognized that most of the time the offshore industry deals with drilling. The principal marine skills are normally brought into play perhaps five percent of the time when the rig is being moved.

Most of our leaders in the offshore industry come from the drilling side of the business and learn the necessary marine skills. The Panamanians recognized this duality and adopted the perspective that led to a regulatory regime which encourages a productive offshore drilling industry. We get a similar, very positive report about the working relationship between industry and government in the United Kingdom. Industry input is sought at an early point, and joint industry-government meetings are set up to review intended regulations as a routine part of the code-making process. A like system now appears to be working pretty well in the United States, though there was a bit of rough sailing early on. Today, the United States Coast Guard, which has primary responsibility for safety on the Outer Continental Shelf, actively seeks industry cooperation in drafting regulations.

A timely example is the current work being done by IADC member companies to prepare an in-depth analysis of marine skills

and knowledge for presentation to the U.S. Coast Guard to be used as a basis for developing future licensing regulations. Addressing the Symposium on the Safety of Life Offshore last year, Captain Thomas Tutwiler, Chief of the U.S. Coast Guard's Merchant Vessel Inspection Division, described his mission this way:

The goal of government is to ensure an acceptable level of workplace safety without overburdening industry to the extent that it is uneconomical to develop seabed resources. Government agencies cannot isolate themselves in establishing workplace safety rules. Agencies must become familiar with the industries they are regulating in order to determine safe practices that are at the same time economically feasible (7).

Canada today has a rare opportunity. Offshore development is comparatively new here, and you are not bound by decades of ponderous precedents. With this clean slate, you have the opportunity to write one of the best regulatory regimes in the world. But please do not get carried away. Canada, like most nations, has some peculiar needs. But if you write regulations so specific that they are out-of-step with the world community, you will hog-tie offshore activities here for years to come. The nature of the offshore industry demands that drilling contractors regularly move in and out of the waters of many nations. We must have a high degree of uniformity of standards, if we are to remain operationally and economically viable. If there is any way possible, we in IADC ask that Canadian regulators examine the possibility of having identical licensing and personnel requirements for all of North America, perhaps generating a realistic pattern for other nations. Beyond this, I want to strongly suggest that in drafting offshore regulations, Canadian officials look long and hard at the considerable effort the International Maritime Organization has put in on this subject. The IMO has drafted several internationally applicable safety codes for offshore operations. This is entirely appropriate, since the IMO is the only body I can think of that comes close to being truly representative of the international maritime community. This is not to say that we agree with absolutely everything that the IMO has done. For example, we do not agree with the final way in which some technical questions were resolved in the IMO's MODU code. But the International Maritime Organization has been conscientious in seeking the input of industry in the code-crafting process. And it does provide a truly international forum for considering safety and other maritime matters.

I want to make one more suggestion with

regard to establishing a Canadian regulatory regime; give the responsibility entirely to a single agency. One of the most bewildering problems we have run into in the Canadian offshore is the herd of agencies that have a hand in the regulatory process. For example, at the federal level you have the Canadian Coast Guard and the Canadian Oil and Gas Lands Administration, not to mention Revenue Canada, and Customs and Immigration. Then, there is the Newfoundland Petroleum Directorate, the Ministry of Labour and Manpower, various Nova Scotian agencies, and others. All of these are in addition to the regulatory agencies of flag country of the drilling rig, and the various classification societies. This often results in multiple inspections with all the redundancies that implies. I know in one case, we had to run the same ballast control drill several times as one agency after another came out to make sure we were doing it right.

I submit that the Canadian Oil and Gas Lands Administration should be the lead organization for the regulation of safety offshore. I want to urge COGLA, however, to rely strongly on the Canadian Coast Guard for sound advice. Coast Guardsmen are mariners; they learned their craft "out in the weather" and they understand what safety on the seas is all about.

The sinking of the *Ocean Ranger* was a great shock for all of us here today. We certainly felt it in a visceral way at Zapata because the *Zapata Uglund* was one of the two rigs that weathered the storm that claimed the *Ranger*. All of us in this room have spent a good deal of time during the past two years assessing this tragedy, just as we did following the sinking of the *Alexander Kielland* two years before that. Where changes have been needed, changes have been made, particularly in the area of training. The *Ocean Ranger's* owner, ODECO, for example, established a Marine Division specifically charged with the training and certification of marine employees and supervisors. I think we all have a stronger awareness of the marine side of our business than before. Additional changes may be needed, and regulations may be required to insure compliance with them. But it would be a serious mistake to gush forth with a knee-jerk flood of new, unwise and untested regulations, just to satisfy a political mandate to "do something." The hardest task of all is to take the time needed to do the job right when you are surrounded by a clamour for instant action. The Royal Commission on the *Ocean Ranger* can be the vehicle for drafting one of the most modern, effective and successful offshore codes in the world today. We have only to continue to work together.

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Canadian Petroleum Association

Mr. Bonke has been employed with Shell since 1956 and currently is Manager of Environmental Affairs, Frontier Exploration Program. He has been extremely active in industry associations, serving on the Board of Directors of APOA/EPOA, and as Chairman of the EPOA/APOA Offshore Safety Task Force. Mr. Bonke is presently Chairman of the Canadian Petroleum Association Offshore Operators Division.

PAPER H4

A Control Regime and Structure for Effective Maintenance of Operational Safety

INTRODUCTION

The purpose of this presentation is to provide an overview of the Canadian regulatory system from the perspective of the Canadian offshore petroleum industry. My remarks will focus on the regulatory system as it relates to safety and exploratory drilling off Canada's East Coast. The presentation is divided into three parts:

1. A brief description of the present regulatory regime;
2. An overview of the concerns and problems industry has with the present regulatory practices;
3. Some constructive suggestions to assist in improving the effectiveness and efficiency of the system.

THE EXISTING REGULATORY SYSTEM

The existing regulatory system in Canada involves a number of government departments and agencies, both federal and provincial, having a wide range of responsibilities. Government, through its various agencies, administers numerous policies, acts, regulations, guidelines, standards, and directives relevant to offshore petroleum activities.

The federal government, through the Canada Oil and Gas Lands Administration (COGLA), administers acts and regulations relevant to land tenure and drilling operations on Canada's continental shelf. Specifically, these include the *Canada Oil and Gas Act*, the *Oil and Gas Production and Conservation Act* and the *Canada Oil and Gas Drilling Regulations*. All activities associated with the exploration of oil and gas must be authorized by COGLA. COGLA inspects and monitors operations, ensuring activities are conducted in an operationally and environmentally safe manner and that national and regional benefits are provided. Government controls industry's offshore exploration activities through a detailed application and permit system. It is the responsibility of the operator to demonstrate to the government that its drilling operations can be conducted safely. This system is designed to ensure that operators' plans comply with government regulations before any drilling takes place. Once underway, government monitors operations and enforces regulations. The interaction between the federal government and the offshore exploration

industry is shown on the accompanying figure.

Each oil company operator first enters into an Exploration Agreement with COGLA. An Agreement specifies the interest holder's rights on certain lands and commits the company to a program of activities during the term of the Agreement, usually from three to five years. A Canada Benefits Plan contained within the Agreement states the industrial, employment and social benefits expected from the activities. When an operator plans to commence drilling operations it first applies for *Drilling Program Approval*. This Approval permits the company to use a certain drilling unit within a specified region during a particular time frame. The operator provides COGLA with a detailed description of the drilling program, including information on the drilling unit, training and qualification of personnel, contingency plans, operating manuals, proof of financial responsibility, and an overview of the geology, possible seabed hazards and operating conditions at the drill site. Government reviews and evaluates the application and inspects the drilling unit and equipment.

Upon receipt of *Drilling Program Approval* the operator then submits its application for *Authority to Drill a Well*. In this application the operator provides additional information on specific well programs and updates the description provided in the *Drilling Program Approval*. COGLA reviews this submission and, if found acceptable, authorizes the drilling of the well. Once authorization is received and drilling is underway, COGLA monitors and inspects operations while enforcing regulations. COGLA retains close contact with the operator on its daily activities and monitors the operator's fulfillment of the drilling program plans. The operator must conduct its operations according to regulations, guidelines, and directives. Failure to comply can result in withdrawal of the drilling authority.

The Canadian Coast Guard also has responsibility for offshore safety through its administration of the *Canada Shipping Act*. The Coast Guard controls and approves the design and construction of the marine components of drilling units and support vessels, their safety equipment, and the staffing of vessels. A *Memorandum of Understanding* between COGLA and the Coast Guard specifies their respective activities. Several other federal government departments, agencies, and advisory groups such as the Ministry of Transport, Department of Communications, Department of Environment, and the Canada Employment and Immigration Commission, have consultative roles to COGLA on matters pertaining to safety, communications, environment, employment and labour practices.

The provincial government of Newfoundland and Labrador, through its Petroleum Directorate, also administers legislation and regulations relevant to offshore drilling operations. Other departments are involved in training, safety, local preference purchasing, and emergency measures. These provincial regulations overlap with federal activities.

Under the Canada/Nova Scotia Agreement on Offshore Oil and Gas Management and Revenue Sharing, the COGLA Nova Scotia Office was established under the direction of the Joint Canada/Nova Scotia Offshore Oil and Gas Board. Offshore exploration activities are subject to federal legislation and regulations. Provincial representatives provide an advisory role to COGLA in COGLA's routine administration of industry's exploration activities. Personnel from the Nova Scotia Department of Mines and Energy also work with industry, COGLA, and other provincial departments on matters pertaining to exploration activities.

The regulations and requirements of the federal and provincial governments are comprehensive, covering virtually all aspects of exploration activities such as drilling, well control, evacuation procedures, fire prevention and handling, navigation, electrical standards, and personal safety.

In summary, it can be seen that the petroleum industry is heavily regulated by numerous government agencies. Both the regulations and the regulatory regime are elaborate, complex, and intricate.

CONCERNS AND PROBLEMS

Industry has a number of concerns and problems with the present regulatory system. I will address four of these concerns:

- Problems associated with administrative overlap and complexity
- The inflexibility of certain regulations
- The practical problems of implementing regulations
- The procedure of developing regulations

Regulatory Overlap, Inflexibility and Complexity

In its recent review of safety practices in the Canadian offshore, the industry-sponsored Offshore Safety Task Force identified certain deficiencies, overlaps and conflicts in regulatory requirements. For example, different regulations were found to have inconsistent requirements for survival craft, life rafts, and life buoys. Canadian regulations have been designed to regulate both shipping and drilling operations. Problems have arisen when trying to regulate these distinct activities simultaneously.

It should be remembered that the offshore petroleum exploration industry is an international business. As many offshore drilling units are foreign-registered, there are instances where Canadian requirements differ from those of the flag state. This has created some confusion.

Detailed regulations in some offshore areas have caused difficulties and inefficiencies to industry and regulators. Overly detailed regulations can result in preference being given to the judgment of the regulation-writer over the judgment of the designer or operator. In many instances the regulation-writer does not have all of the required information for a specific operation. This is a particularly important concern in Canada where site-specific solutions are required to accommodate various operating conditions.

Certain regulations are too rigid. Canada's offshore regions vary considerably (such as differences in sea state, ice conditions, and remoteness) and often require unique solutions in order to operate safely. Because technology changes rapidly, industry believes regulations should be flexible enough to ensure that the best available technology is used. In general, we suggest that regulations should specify performance standards rather than particular techniques or procedures to be followed. This would ensure the flexibility we need.

Some obsolete regulations are in effect in Canada which require revision, updating or deletion. Obsolete regulations as well as deficiencies, conflicts and rigidity in regulations may have an undesirable effect on safety.

Implementation

The oil company operator, having received authorization to drill the well, is responsible for the safety of its operations. The operator in turn relies upon contractors to undertake a variety of tasks on its behalf, such as providing drilling services, helicopter support, and supply vessels. The operator ensures that the drilling contractor conforms to the operator's internal policies and with government regulations through terms specified in the drilling contract. The task of managing several contractors and sub-contractors, while ensuring that all pertinent regulations are being complied with, provides a significant challenge to industry in time and expense. Industry recognizes the important role and responsibility of government in regulation. There is room for improvement, however, in regulating industry's activities with greater efficiency and effectiveness. We would like to see our resources utilized more effectively and directed to promoting safety.

The Regulation-Making Procedure

Until very recently, and with the exception of the Coast Guard Marine Safety Advisory Council, no formal procedure existed which solicited industry input on offshore marine safety matters. The process of developing regulations is not a clearly-defined process. No specific administrative process resolves conflicting regulations and no regulatory process systematically promotes the adoption of better technologies. The timing of industry's participation in the development of new regulations has not been consistent. If industry's input into the regulatory process is limited to review of final drafts of regulations, then certain opportunities for developing effective regulations may be lost. Despite inadequacies in the system, COGLA and the offshore industry currently cooperate in the development of offshore drilling regulations. As well, the Canada Lands Safety Advisory Committee was recently formed to address various safety issues and to provide a mechanism for industry input into offshore safety concerns.

IMPROVEMENTS

Although the petroleum industry meets and in many cases exceeds existing regulatory requirements, we believe there is a better approach in managing offshore safety in Canada. The key elements of an effective control system can be envisioned. First, industry and government should recognize the limitations of regulations. Regulations are only one component of a comprehensive control system which provides safety management. A fundamental and common objective of industry and government must be to provide a safe working environment for offshore operations. In our view, the best control system would incorporate three key features. First, it would provide high standards of safety. Secondly, it could be implemented efficiently and effectively and thirdly, it would provide a mechanism which corrects problems in the system and initiates positive change in a timely manner. A control system with these features would be effective without being unnecessarily complex.

The best control system for achieving safe operations is characterized by clarity, consistency, and ease of implementation and monitoring by the operator, contractor, and regulator. It would provide flexibility when applied to different offshore regions in Canada and would encourage the use of improved technologies while providing stringent performance safety safeguards. Industry actively supports these types of positive changes to the regulatory system.

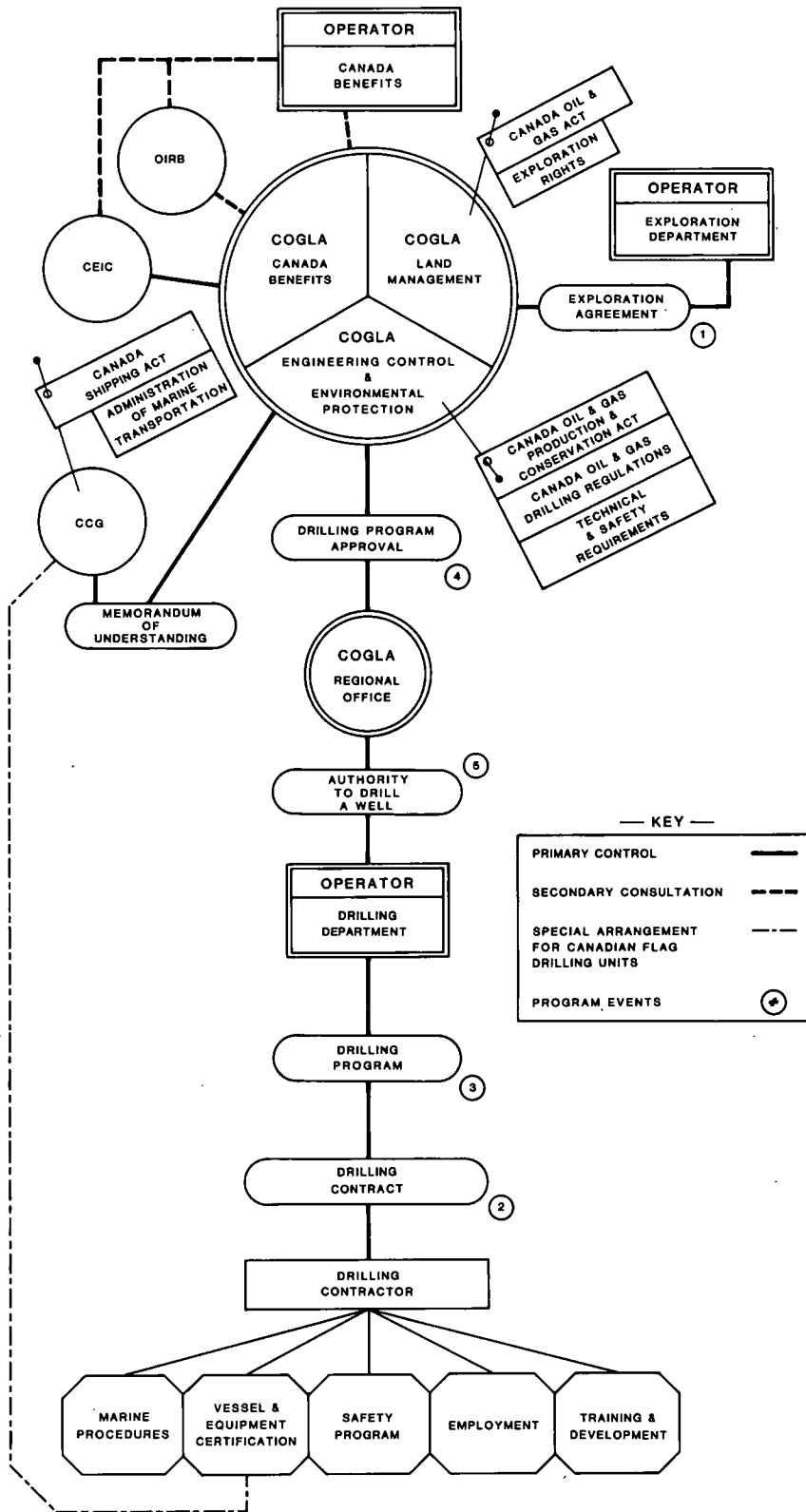


FIGURE 1 (Source: Manadrill Drilling Management Inc. "An Evaluation of Industry Safety Management in Eastern Canada Offshore Drilling Operations.")

Effective, Efficient, and Flexible Regulations

Highly detailed regulations have not necessarily resulted in greater safety. A modest degree of detail in regulations is the most appropriate solution to providing safety in an efficient and effective manner. Regulations need to be simplified. Complicated regulations can be confusing and may be applied inappropriately. With more appropriate regulations, industry would be better able to manage its operations in a more effective manner. A less detailed body of regulations consistent with one another would remove the confusion surrounding the large number of complex and intricate regulations. Canadian marine-related safety regulations applicable to offshore exploratory activities should include international, national, and regional considerations (such as differing standards and operating conditions) to minimize conflicts and provide compatibility among regulations. Continental Shelf Act legislation would resolve much of the jurisdictional confusion and legal uncertainty now present. As well, a means should exist to upgrade regulations systematically with the best available safety technology. Regulatory overlap, conflicts, and deficiencies should be minimized and resolved jointly by government and industry. Government and industry should review the regulatory system to establish which types of operations require highly detailed and specific regulations and those requiring flexible and general regulations which set performance standards. Although monitored by government, industry would be left to achieve these standards. It must be recognized that regulations are only one component of a control system. Regulations alone do not adequately achieve the other requirements of safe operations, those of competent personnel having an ingrained attitude of safety, and of effective communications between regulator, operator, and contractor.

Commitment and Attitude

Industry recognizes that competent personnel are the key to safer operations. Continuing emphasis on safety by all industry personnel is necessary to ensure safety. Companies' policies, training, and practices must reflect this commitment. Safety must be an integral part of the attitude of all persons involved in the operations: workers, supervisors, and senior management. Training, attitude, and good working conditions reduce the potential causes of accidents from human error. Commitment and attitudes cannot be legislated nor regulated. Personnel are better able to perform safely when motivated by an attitude of "safety

first", than for the reason of compliance with regulations. Emphasis should be placed on results rather than on mere compliance.

A Mechanism for Improvement

Ensuring safe operations is a joint effort by government and industry. Each has its roles and responsibilities. In authorizing an operator to drill a specific well, government places the onus on the operator to demonstrate that its program can be conducted safely. Government inspects and monitors operations to ensure that the operator complies with regulations. The operator has the ultimate responsibility for the safety of its operations. Charged with this responsibility, industry should have a full opportunity to work with government in making existing regulations more effective and be involved at an early stage in the development of any new regulations and guidelines. Both parties would determine the requirements of new regulations in terms of level of detail and how best to implement the regulation. Industry could apply its practical experience in operations to the design of regulations and guidelines. Industry would provide its perspective on the effectiveness of proposed regulations, its context in operational realities, and whether safety can be improved by the adoption of the regulation. In certain cases the responsibility should be delegated primarily to industry to develop its own guidelines. Through a joint government-industry forum, existing problems with the regulatory system can be addressed and resolved and more effective regulations and requirements can be developed.

Industry Experience

The petroleum industry has conducted offshore exploratory operations in Canada for over 20 years. To conduct these operations safely required a conscientious effort by operators and contractors in providing properly designed and constructed equipment as well as experienced and well-trained personnel. Industry has demonstrated its commitment to safety. Industry has powerful incentives which necessitate this commitment: its financial investment, the prospect of oil and gas production, and its investment in people.

Progress

The EPOA/APOA Offshore Safety Task Force published a report in December 1983 with numerous and specific recommended actions on a range of offshore safety issues. All of the recommendations have been reviewed and actions are underway by industry and by government. We have seen

a commitment by industry and government to make improvements in the present regulatory system. During the course of, and subsequent to, the Offshore Safety Task Force study, industry has introduced numerous changes to its operating procedures and management functions related to offshore safety. Government also has responded to certain of the problems identified by industry and has introduced changes to the regulatory system. Maximum cooperation and dynamic communications are required between industry and government to ensure that the improved safety of offshore operations is an ongoing process. The Royal Commission has furthered this cause through this conference and through its investigation of practical means to improve the safety of offshore drilling operations off the East Coast. Judging from the progress made in recent years, we are confident that operations offshore Canada can be conducted effectively, efficiently, and safely.

Summary of Panelists' Discussion

Session Chairman Dr. J.E. Hodgetts brought forward for discussion two issues which came to light in the presentations of the panelists: 1) that industry prefers to deal with a simplified organizational structure with a minimum of administrative overlap in its dealings with government, taking into account the Canadian setting of Federal/Provincial relations; and, 2) that the view of industry towards broad, discretionary self-regulation is an unrealistic suggestion.

Mr. I. Manum (Norwegian Maritime Directorate) related Norway's experience with having a preponderance of regulatory bodies to control various aspects of the offshore industry. He said that Norway has reduced the number of agencies to a more manageable size, but there is still more than one. This, however, has not posed serious problems, as Norway does have just the one certifying authority which issues the letter of compliance based on the work provided by the existing regulatory bodies. Therefore, he said, industry is not confused about who the certifying authority is.

Mr. G.L. Hargreaves (Consultant, U.K.) agreed that, because government is always a growing organization, the problem of too many regulating agencies will always be there, not only for the industry who must deal with the agencies, but also for the government itself. It is difficult to avoid administrative overlap, but interdepartmental arrangements can be arranged, for example, the U.K. Dept. of Energy enforces the rules of the Health and Safety Executive. Nevertheless, Mr. Hargreaves thought the best that could be achieved would be to reduce the number of channels with which industry must deal, as one single authority is not a reasonable alternative.

Mr. C. Bonke (CPA Offshore Operators Division) expressed the industry view that the single window approach, as is seen in the Canada Oil and Gas Lands Administration, avoids problems in complying with regulations and is a preferable means of dealing with regulatory controls. Mr. Bonke clarified the industry's view on self-regulation as being a mix of both industry and government involvement. He maintained that regulations should be realistic.

Summary of General Discussion

Mr. T.S. McIntosh (IADC) addressed the issue of regulation through a single government source and said that, in Canada, there should be only one agency, such as COGLA, with which the industry should have to deal with regard to regulatory requirements. He criticized the practice of throwing the industry into the midst of inter-governmental squabbling and urged that these problems be solved without involving industry.

Mr. McIntosh also addressed self-regulation by industry and pointed out that industry would respond in a responsible manner if given a direct charge. An element of trust, however, is required for this approach to be successful. Mr. McIntosh suggested that governmental regulation is no more infallible than regulation by industry. To avoid problems, he encouraged an approach which would have industry draft regulations as required, have their technical soundness verified by an independent certifying agency (such as a classification society), and have the governmental agency which is in authority give the final say.

Mr. Leo Brandon (COGLA) outlined the methods COGLA currently employs to regulate the offshore industry. He first of all emphasized that COGLA is in constant dialogue with the Canadian Petroleum Association and the Independent Petroleum Operators Association so that industry actually does have some input into the regulation-making process. He referred to the Canada Lands Safety Committee (comprised of industry and government representatives) which has been established to encourage dialogue aimed at increasing safety within the industry. COGLA also issues guidelines to enhance the regulations for the industry and to make regulations which are generally a little more specific for the purpose of implementation. Standards are another avenue for control and COGLA contributes financially to the offshore-related work being done by the Canadian Standards Association towards the development of relevant standards. Mr. Brandon pointed out that, in addition to regulation through acts, regulations, guidelines, and standards, COGLA has the option of withdrawing the Operator's Permit to Drill, although this option is not often used.

Mr. Brandon also referred to the involvement of the Canadian Coast Guard in the regulatory process, which has resulted from an increasingly evident indication that the marine aspects of the offshore industry are more relevant to their areas of concern. This

involvement has been formalized in a Memorandum of Agreement between COGLA and the Canadian Coast Guard.

Mr. R.A. Quail (Canadian Coast Guard) agreed that Canada is indeed trying to provide industry with one window service through COGLA. Coast Guard administers the *Canada Shipping Act*, applying it not only to the flag rigs but also to rigs drilling in Canada waters, through the drilling permit issued by COGLA.

The Marine Safety Advisory Committee of Coast Guard provides the means for consultation, negotiation, and input by industry (owners, operators, and workers) and government towards the development of regulations which are realistic.

Professor W.G. Carson (La Trobe University, Australia) reminded participants that it was the lack of detailed and enforced regulations on the training of ballast control operators which resulted in the *Ocean Ranger* disaster and, hence, the Conference. That training of ballast control operators has not changed drastically since the *Ocean Ranger* is an indication that industry is not self-regulating, even after lessons such as the *Ocean Ranger*, and it should, therefore, not be allowed to be self-regulating.

The political and economic context in which the *Ocean Ranger* incident occurred, falling as it did between several regulatory regimes, should be taken into account in future considerations of regulatory control and the responsibility of its enforcement.

Professor Carson suggested that, for maximum input to the occupational health and safety of workers, organized labour should be involved in framing and implementing the regulatory regime in offshore eastern Canada. He cited the example set by other jurisdictions which have involvement from management, unions and government regulators. He suggested that the Commission recommend unionization of offshore eastern Canada in its Part Two Report. Mr. V. Greif (SEDCO, Inc.) referred to his experience in a unionized setting in offshore Australia, and found it to be self-defeating and disruptive to operations. He opposed the idea of unionization in Canada's East Coast offshore. Mr. I. Manum (Norwegian Maritime Directorate) commented that Norway, which uses close cooperation with unions in all respects, such as making regulations and funding research, is experiencing no difficulties with union participation. Mr. N. Letalik (Dalhousie Ocean Studies Program) asked whether it has been shown conclusively that

union involvement in the offshore oil industry has had either a positive or negative effect on operations. Mr. McIntosh responded that in his experience, unions have been neither inherently bad nor inherently good, and that a great deal depends on the individuals involved. He said that the accident record of Zapata on rigs around the world is independent of whether unions were involved.

Mr. G. Yungblut (EPI Consultants) asserted that industry involvement in the formulation of regulations is not only desirable, but also necessary, since the industry is where the expertise is, and only their involvement will lead to the generation of practical, reasonable, and useful regulations. He did, however, point out that industry has in the past been agonizingly slow in responding to requests for standards and wondered what could be done to speed up this process. Mr. McIntosh felt that giving industry a deadline would achieve the desired results, but advocated that heavy industry involvement in the drafting and implementation of rules and regulations, with the attendant governmental supervision, is preferable to total self-regulation. Mr. Manum said that in Norway regulations are created to prevent accidents and are therefore based on the results of studies or inquiries of accidents and of their causes.

With regard to developing guidelines, Mr. Greif spoke about the appropriateness for industry of the open dialogue that exists in Canada and the U.K. sector of the North Sea, as well as the systems in those jurisdictions which use independent, as well as government inspectors. He said that the Norwegian regulatory system is far too over-regulated and inflexible, and tends to work against industry. Industry is receptive to the Canadian approach which uses guidelines and dialogues which permit industry to have input into the regulation of their affairs. He encouraged the practice of governmental regulators gaining familiarity and experience by working in the industry on a variety of MODUs in various jurisdictions.

Dr. E. Gold (Dalhousie Ocean Studies Program) cited continuing efforts during this century, particularly by the Commission which investigated the *Titanic* disaster, to upgrade the regulatory regime as it is applied to shipping, but industry even then resisted change and advocated self-regulation. With the exception of the nuclear industry, there has never been any industry successful in either self-regulation or cooperative regulation; therefore, there must be

effective governmental regulation and enforcement. Dr. Gold pointed to the Norwegian method of formulating and administering regulations as a good model.

Dr. Gold expressed concern about the effectiveness of an international organization like IMO which takes an average of seven to ten years to set standards which achieve the lowest common denominator for marine safety. These standards offer some guidance but are unacceptable for drilling in the Canadian offshore environments which have unique conditions requiring unique standards. While the functioning of IMO is improving, there is a question about its jurisdictional effectiveness over MODUs, and this remains to be resolved. Furthermore, the Maritime Safety Committee of IMO, which is comprised primarily of Norwegian representatives, tends to be susceptible to pressures from the shipping industry, the oil industry, and the insurance industry. Dr. Gold also referred to the question of enforcement of IMO standards. He felt that as long as oil rigs are subject to flag state and limited coastal state jurisdiction, enforcement will not be effective because many rigs are still under open registry flags.

Mr. Manum responded to the suggestion that IMO provides only minimum standards by saying that even those have value as a base for expanding the standards. The IMO code for MODUs does need improvement, and this is one of the primary goals of IMO at present. Mr. Manum did not think that enforcement is a great problem, since most coastal states have regulatory control which generally exceeds the usual port state control. In addition, certificates offer a method of control which saves much time in checking rigs.

Mr. I. Townsend Gault (Dalhousie Law School) cautioned against using Norwegian, British, and Australian offshore regulatory systems as models for Canada, since these were developed in particular political and economic environments which are not necessarily similar to those in Canada.

Mr. Townsend Gault expressed the opinion that deregulation of the offshore oil industry is premature. No one has yet examined the efficacy of regulations which today tend to focus on the quality of the machinery and not on the operation of it by individuals. Because this focus has not been solidly determined, the question of increasing or decreasing regulations is untimely.

Of concern also to Mr. Townsend Gault is the legal status of the enforcement of guidelines which are not regulations and which

are sometimes incompatible with existing regulations. He disapproved of the use of the revocation of the operator's licence as the ultimate sanction and felt that it is more appropriate to "tidy up" and update the current set of regulations while at the same time avoiding the rush to create numerous new ones in the aftermath of the *Ocean Ranger*.

The lack of any criminal law jurisdiction over the Canadian offshore is another problem that Mr. Townsend Gault identified as being of concern and he criticized the inattention of the Federal Government to it. He said that the process of changing regulations in response to changing circumstances has always been slow but it can and should be hastened, and he outlined the problems encountered by the operators in complying with Flag State versus Coastal State requirements which are often not compatible. He referred to a move by the Law of the Sea Convention and the U.S. towards granting the Coastal State supremacy over Flag State jurisdiction, and suggested this approach should be considered by Canada as well.

Mr. Letalik spoke about the lack of effort by industry to learn from disasters which have occurred and to effect appropriate changes within the organizational structure of the industry. He cited the experience of the Japanese auto industry which, in order to improve quality control, reduced the number of management levels so that the implementation of production changes is never far removed from the decision makers. He wondered whether this approach had been considered by the oil industry, both on a company level and on a general, industry-wide level.

Mr. C. Bonke (CPA Offshore Operators Division) responded that the oil industry as a whole has displayed a very heavy commitment to safety, and each company implements this commitment through its own organizational structure. He said that the Offshore Operators Division of the Canadian Petroleum Association is a new development which resulted from changing conditions and which is an attempt to bring the management team closer to the actual operations. Mr. McIntosh agreed that industry everywhere is constantly scrutinizing and evaluating safety programs and practices, and that symposia are held, training procedures are upgraded, and safety awareness generally is in the forefront.

Mr. Manum indicated that Norway is about to introduce regulations on internal control

systems, which are intended to ensure that the top management people of a company are not too far removed from operations in the organizational structure of the company.

Mr K. Oakley (CPA Offshore Operators Division) reviewed the official policies of the industry on safety, and the measures which have been taken, often in full consultation with government, to enhance safety. While industry approves Canadian Coast Guard certification of marine personnel, it feels that standards for and certification of other rig personnel not now covered by the regulations should be the responsibility of industry, with review and input from government; a joint effort by operators and drilling contractors has already identified and described training qualifications and standards for MODU personnel. Mr. Oakley pointed to the industry-supported Petroleum Industry Training Service as the appropriate vehicle for carrying out this responsibility.

Mr. Oakley reminded participants that the offshore oil industry in eastern Canada is still in the exploration phase and forecasting the future use of rigs is risky. Because the region currently has twelve rigs operating, CPA does not subscribe to the use of a multi-purpose search and rescue vessel as the answer to the safety problem. The industry believes that properly equipped and manned standby/supply vessels and dedicated, industry-contracted helicopters are more effective in maximizing operational safety objectives. Mr. Oakley indicated that industry would by far prefer a user pay system, with fully trained SAR technicians, operated by the government. He felt that there has been and still is active cooperation between industry and government and referred to the recently-created Training Committee comprised of representatives from the Governments of Canada, Nova Scotia, and Newfoundland, and from industry. He also referred to the continuing cooperation amongst the operators themselves, who are constantly getting together to improve safety equipment, communications, training, and logistics.

Session Chairman J.E. Hodgetts concluded discussions by referring to the lack of debate by participants on the role of drilling contractors in all the systems and processes which were discussed, especially since they seem heavily involved in the actual implementation of regulations.
