Report of the Public Review Commissioner for the White Rose Development Application

Submitted to

Minister of Natural Resources
Government of Canada

Chairman
Canada-Newfoundland
Offshore Petroleum Board

Minister of Mines and Energy
Government of Newfoundland
and Labrador

September 2001

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Public Review Commission

White Rose Development Application

September 2001

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Ottawa, Ontario
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Mr. H.H. Stanley
Chairman and Chief Executive Officer
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Dear Ministers and Mr. Chairman:

In accordance with my Terms of Reference issued on January 29th, 2001, I have completed the public review of the White Rose Development Application.

I have requested public input and conducted public review sessions and undertaken my own assessment of the Development Application. I am therefore pleased to submit this report for your consideration.

Sincerely,

H.M. Clarke
Commissioner

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EXECUTIVE SUMMARY

The White Rose oil development is a unique one. It is the first such development proposed under the Province of Newfoundland's generic royalty regime, and the first with benefits provisions being put forward solely by the developers, as submitted in their Canada-Newfoundland Benefits Plan. It is also the first offshore development to undergo a stand-alone public review under the Accord Acts. This report is the outcome of that review process.

The proposed development is located in the Jeanne d'Arc Basin 350km east of Newfoundland. The Proponent is a co-venture between two large Canadian petroleum producers: Husky Oil Operations Limited (72.5%) and Petro-Canada (27.5%). The project is expected to recover some 230 million barrels of oil over a 12-year period. The preferred mode of development is a floating production storage and offloading facility, or FPSO. The oil will be processed on the FPSO and transferred to shuttle tankers for export to market. As presently scheduled the Proponent expects project approval in the fourth quarter of 2001, with first oil expected in the third quarter of 2004. Besides oil, the White Rose Significant Discovery Area (SDA) also contains the most significant quantities of natural gas discovered to date on the Grand Banks; the Proponent does not, however, seek approval to develop these gas resources at present.

During the course of the public sessions, the Commissioner received balanced and well-researched public input. Also the Proponent's presentations and responses to questions were helpful and demonstrated great flexibility in meeting the Commissioner's needs. In general, the key areas of public interest and concern can be grouped into four, at times overlapping, categories: the development plan including questions surrounding the mode of production and deferred development; the benefits that would flow to the Province as a result; environmental and safety issues; and, the overall regulatory process for the Newfoundland offshore.

The report therefore deals with the White Rose Development Application submitted by the Proponent, and contains the Commissioner's review of the project, including comments received from the public. It also includes, as per the Terms of Reference of the review, the Commissioner's recommendations. The review took place over a 6-month period from March to September 2001 and consisted of two phases of public input. In total, the Commissioner heard 35 presentations from 29 different groups or individuals, in addition to numerous presentations from the Proponent.

The report is an advisory document and is submitted to the Canada-Newfoundland Offshore Petroleum Board (C-NOPB) as the regulatory body, to the federal Minister of Natural Resources and to the provincial Minister of Mines and Energy. It will be considered by the C-NOPB in its decision-making process regarding the Development Application.

The Commissioner's Terms of Reference stipulate that the review cover all relevant aspects of the proposed and potential development of the White Rose SDA, including:

- the general approach to the proposed and potential development and exploitation of the petroleum resources of the White Rose SDA;
- the resulting benefits expected to accrue to the province of Newfoundland and Labrador and to Canada, with particular regard to the requirements for a Canada-Newfoundland benefits plan; and
- considerations of human safety and environmental protection incorporated into the proposed design and operation of the Project.

These three areas are the subject matter of the three main chapters of the report, being chapters 3, 4 and 5.

General Development Approach

Chapter 3 focuses on the selection of the Proponent's preferred production and transportation system and the question of deferred development of the additional oil and gas resources of the White Rose SDA.

The preferred system is the FPSO which the Proponent believes is the only economically viable option for White Rose. The Proponent stated that the FPSO will also be designed with the flexibility and capability to handle the planned deferred oil development and furthermore that modifications can be made to enable the FPSO to produce and export gas. Finally, the Proponent believes construction and operation of the FPSO based production system can provide significant Newfoundland and Canadian benefits over the life of the project.

Other presenters took the view that utilization of GBS technology is safer and more suitable in our harsh environment, and would provide much greater local benefits during the project phase. Likewise, they argued that the GBS technology with improved construction techniques could be suitable for smaller projects like White Rose, and that it could also be employed in the future gas development of the Jeanne d'Arc Basin or the Hebron development.

Having considered all the technical and cost information presented, and despite considerable problems with the details provided for the GBS option, the Commissioner recommends that the Proponent's preferred production system of a FPSO be approved by the Board subject to related recommendations on safety. The Commissioner further cautions the C-NOPB that this technology should be viewed as a maturing technology for our environment and its performance should be monitored closely in relation to research on the technology going on elsewhere in the world. Furthermore, benefits accruing to the province can be significant and acceptable only if this matter is tackled in the manner suggested by the Commissioner in Chapter 4.

The Commissioner also considered the question of deferred development of the additional oil and gas resources in the White Rose SDA. In addition to the proposed core

development reserves of 230 million barrels of oil in the South Pool, the West and North Pools together are estimated to contain 82 million barrels of oil. Additional delineation drilling is required and, depending on the results of early production in the South Pool, it is the intention of the Proponent to pursue development of this additional oil.

There are also substantial gas resources, and while the proposed White Rose project is for oil development only, there are many who believe White Rose is primarily a gas field. The Proponent's estimate of recoverable gas is 1.8 tcf. (versus the C-NOPB's estimate of 2.7 tcf). These numbers equate to the equivalent of 300 to 450 million barrels of oil. There are no current plans for the development of this gas or even to undertake further delineation.

It is the Proponent's position that White Rose gas resources - although the largest gas discovery on the Grand Banks to date - are not sufficient to justify a gas pipeline and a gas development project, but that they can certainly assist such a development. The Commissioner concurs with this statement given what is currently known about the resources. It appears the only way that White Rose gas can be developed is on a basin-wide approach sufficient to justify the gas transportation infrastructure. It is the Commissioner's conclusion that White Rose is in the best position to be the catalyst for such a development, but can only begin to take on that role with early additional delineation work.

Recommendations are made, therefore, to require an early commencement of delineation drilling for gas and to subsequently ensure that the FPSO will be capable of producing gas for export. The Commissioner also believes that the Proponent's approach to oil development, including deferred development of additional oil resources, is reasonable and should be approved provided it does not interfere with future gas development.

Two other important aspects of the general development approach are considered. The first has to do with project economics, and the second with contracting strategy.

On numerous occasions during the review the Proponent has emphasized that the project is much smaller than either Hibernia or Terra Nova and that to ensure economical viability it is essential to control costs. This is repeated as a justification for the contracting strategy being employed by the Proponent.

Having looked at the project economics the Commissioner believes the Proponent's assumptions are conservative. The White Rose development project has a good rate of return (arguably greater than the 18% as advocated by the Proponent's base case) and there is considerable upside potential. It is the Commissioner's view that the White Rose project has to be looked at on its own merits - which are considerable - and that suggestions by the Proponent that it is marginal should not in any way be permitted to relieve the Proponent from carrying out its legitimate responsibilities under the Accord, relevant legislation, and the Board's own guidelines, particularly with respect to Canada-Newfoundland benefits.

The Proponent's contracting strategy is also reviewed. Difficulties with it are obvious from the perspective of the public review and the eventual approval process. The current status of bidding and contract awards create the impression that the process is a *fait accompli*, and that most of the major contracting decisions have been made before the Commissioner's report is released. The Proponent fully realizes that there are risks associated with the approach it is pursuing and that the costs of this approach are the Proponent's. The Proponent's current contracting strategy and schedule does not allow for consideration and implementation of the Commissioner's recommendations should they be accepted by the C-NOPB.

Benefits and the Canada-Newfoundland Benefits Plan

Chapter 4 deals with the key issues of benefits, an issue of great public interest and concern as revealed during the public review process. In this chapter, the views presented at the public sessions are discussed, the relevant provisions of the Atlantic Accord and the Accord Acts are examined, the Proponent's Canada-Newfoundland Benefits Plan is evaluated and recommendations are made.

Issues related to benefits and the Benefits Plan are central to the development of oil and gas in Newfoundland's offshore area and have been since the first discovery. Indeed, the purpose of the Atlantic Accord is to "provide for the development of oil and gas resources offshore Newfoundland **for the benefit of Canada as a whole and Newfoundland and Labrador in particular** [emphasis added]." Unfortunately, there is currently a lack of clarity and consensus regarding Newfoundland's benefits regime. The Commissioner therefore spent a significant amount of time looking at the provisions of the Atlantic Accord and the Accord Acts and conducted research into these matters.

As noted in the Commissioner's analysis of the Accord and Accord Acts (section 4.3), the Atlantic Accord articulates a series of policy objectives and provides a general framework for optimizing Canada-Newfoundland benefits. The Accord Acts (the legislation implementing the Atlantic Accord) provide some guidance by requiring the benefits plan to contain provisions "intended to ensure" the delivery of benefits in certain areas. The legislation ultimately leaves the approval of specific provisions to the C-NOPB. It is the Commissioner's view that provisions "intended to ensure" the delivery of benefits would be more effective if they were clear and definite, rather than vague and general.

It follows that particular goals and objectives for the development that are measurable and reasonably attainable are a necessary requirement for monitoring and measuring the progress and effectiveness of the plan, including its specific elements. A Benefits Plan must also contain pro-active programs designed to build on strengths and remove any obstacles to attaining the goals and objectives identified by the Plan. The requirement for specific targets and goals with respect to benefits - and pro-active programs to achieve them - was a particularly common theme at the public sessions.

The Proponent's Canada-Newfoundland Benefits Plan was consequently evaluated by the Commissioner giving consideration to his analysis of the Accord and to the views expressed by participants in the review process. It is the Commissioner's determination that the Canada-Newfoundland Benefits Plan for White Rose is so general and qualified as to effectively leave complete discretion on benefits matters with the Proponent and its contractors. It is impossible to obtain from the Plan itself a firm idea of what benefits will result from its implementation. Indeed the plan would even permit the use of an FPSO constructed entirely in international shipyards. For a number of significant reasons - all detailed in this report - the Plan is inadequate as written and cannot be recommended for approval.

Recommendations are therefore made that the C-NOPB not approve the Proponent's Benefits Plan and instead that the C-NOPB invite the Proponent to rewrite it to reflect the various improvements advised by the Commissioner (as specified in Recommendation 4.2). It is further recommended that the Board not make a decision on the Proponent's Development Plan until it receives, evaluates and approves a revised Benefits Plan from the Proponent.

While the Commissioner is aware of the Board's tentative decision-making schedule for this fall, the Commissioner is convinced the Benefits Plan can be rewritten and resubmitted in a matter of weeks - if the Proponent is willing - and would not therefore disrupt the Board's time frame unduly.

Finally, it is the Commissioner's conclusion that the C-NOPB should maintain a larger presence and pro-active role in Benefits administration. The Board should articulate a definitive statement to this end, outlining how it interprets the Accord and how it will implement its responsibilities (including its expectations for a model benefits plan). The Report makes recommendations in this important area as well.

Human Safety and Environmental Protection

The area of environment and safety was a major focus of interest for members of the public at the hearing stage, and is covered in Chapter 5.

People expressed concerns about the relationship of oil production to the long-standing fishery in the area, and the need for independent monitors on the offshore installations. The need for a precautionary approach was stressed by a number of presenters both generally and in the context of specific issues such as the disposal of produced water and drill cuttings.

Other presenters raised broader environmental issues such as greenhouse gases and our reliance on hydrocarbons generally. Concerns were raised about impacts on the massive seabird populations on the Grand Banks. The key safety issues of ice management, green water and the command structure of the FPSO were also areas of continuing public concern. The Commissioner's ability to fully address some of these environmental issues

was constrained by the fact that various agencies and government departments did not participate in the public review process.

Nevertheless, recommendations are made in a number of important areas, including with respect to: the level of transparency in environmental management; the significance criteria in environmental assessment methods; the application of the precautionary principle in operational decision-making as well as in planning; operational discharges; and the effects on seabirds, fish and the fishery. A recommendation is also made with respect to an observer program for monitoring and compliance assurance for production facilities.

Several important areas of operational safety inevitably arise with respect to the FPSO. These relate to the command structure during extreme situations that might threaten vessel integrity and marine safety; quick disconnect procedures during emergencies; hull suitability; and, the Proponent's Ice Management Plan. Each of these issues is discussed in Chapter 5 and recommendations are made. Based on the public representations made, the Commissioner believes that improvements can be made in the regulatory regime for offshore safety, and a suggestion is made as to how this can be dealt with.

Additional Issues

A number of other issues were raised in the review process, such as the location of topsides fabrication and procurement of equipment for the FPSO hull. The Commissioner has not addressed these matters directly in a recommendation. Indeed, the Commissioner has not made recommendations with respect to any specific contracts. An acceptable Benefits Plan must be put in place first and then contracting activities carried out with the requirements of the Plan in mind. The Commissioner has recommended against approval of the Proponent's Benefits Plan, not on the basis of the outcome (or anticipated outcome) of a particular contract, but because the Plan does not meet the requirements of a 'Benefits Plan'. The Proponent's Plan is inadequate to guide *all* contracting whether related to elements of the turret, topsides, hull equipment or training, during the project phase as well as the operations phase. Major contractors have in their hands the most important part of delivery of local benefits. A contractor's only link to the Proponent's benefits commitments is through the Benefits Plan. As a result, the Benefits Plan is a crucial document and must be put in place first.

Another issue has to do with a process to reach a consensus and resolve the FPSO versus GBS debate. In the Commissioner's view, it is highly desirable that a determined and focused effort be made to better understand the various issues involved and the viability of each technology for future developments. Accomplishing this would benefit all stakeholders, including proponents, both in terms of benefits and a more efficient planning and approval process. This is basic to building a foundation for the industry of the future.

An additional important issue is the leadership required on a regional basis to bring about the development of offshore gas, as considered in Chapter 3 of the report. It seems that only such an approach can justify the gas transportation infrastructure required.

A fourth topic is the quest of an overall review and possible restructuring of the benefits administration system, which would build on the benefit recommendations made in this report. No one – neither the public, the supply and service industry organizations, trade unions, municipal councils, the regulator nor oil and gas developers - is particularly satisfied with the current situation.

Finally, a number of the Commissioner's recommendations require that additional efforts and resources be expended in the C-NOPB. These are in the areas of economic analyses, safety, benefits administration, environmental compliance and monitoring (observers on production facilities). While no specific budgetary recommendation is made, the Commissioner expects that sufficient budget and resources will be made available to allow the Board to carry out its legitimate responsibilities.

Conclusion

In conclusion, the White Rose Development is an important project. With strong leadership and a positive commitment from all stakeholders involved, the Commissioner believes the White Rose development can represent a key turning point in the development of Newfoundland's offshore, to the best interest of the province, its people, and the proponents. The Commissioner's recommendations are designed to ensure that the Project is developed in a safe and environmentally responsible manner and with an acceptable level of benefits. The Commissioner's recommendations in this report also provide certainty for investment and development consistent with the competitive global environment in which the oil industry operates, and more.

1 INTRODUCTION

1.1 Project Description

The White Rose Development Application is a proposal to exploit the oil resources of the White Rose oilfield. The Proponent is a co-venture between two large Canadian petroleum producers, Husky Oil Operations Limited (Husky Oil) and Petro-Canada. If approved, Husky Oil will operate the development.

The White Rose field lies within the White Rose Significant Discovery Area (SDA) located on the eastern edge of the Jeanne d'Arc Basin, approximately 350 km east of the island portion of the Province of Newfoundland, and approximately 50km from the Terra Nova and Hibernia fields: see Figure 1.1.

Figure 1.1
White Rose Field Location Map

Husky Oil is a major operator in the Newfoundland offshore area, in particular in the Jeanne d'Arc Basin where it holds 39% of the Significant Discovery Licenses (SDLs) and 24% of the Exploration Licenses (ELs). The company has been involved in exploration on the East Coast since 1982, and continues to acquire new properties on the Grand Banks for further exploration. It now believes that the White Rose oilfield, discovered in 1988, is ready for development.

Drilling results indicate that the field is divided by faults into three separate pools, the South Avalon Pool, the West Avalon Pool and the North Avalon Pool. The Proponent proposes at this time to develop the oil reserves in the South Avalon Pool only, which is estimated to contain 230 million barrels of recoverable oil and to have a production life of 12 years. The production life of the oilfield could be extended depending on the later development of North Avalon and West Avalon oil resources.

The White Rose SDA also contains the most significant quantities of natural gas discovered to date in the Newfoundland offshore area. The Proponent's Development Application addresses those gas resources but does not seek approval to develop them at present. The present proposal is to re-inject excess natural gas produced from the South Avalon Pool into the North Avalon Pool for conservation in the event that gas production is a commercially attractive venture in the future.

The preferred mode of development is a ship-shaped floating production, storage and offloading facility or FPSO, similar to that employed at Terra Nova. The FPSO will be positioned in 120m of water between three drill centers, each located in an excavated glory hole below the seabed to protect the wells from iceberg scour. The drill centers will be connected to the FPSO facility via a system of manifolds, flowlines and flexible risers that will be connected to the vessel's turret by a disconnectable spider buoy. The turret is designed to remain moored on station while the vessel weathervanes to the most favorable wind and wave conditions. It is also designed for quick disconnect to allow the FPSO to leave station should conditions require.

The Proponent estimates that the facility when fully operational will have daily production capacities of 100,000 barrels of oil, 150 million cubic feet of gas and 180,000 barrels of water. The oil will be fully processed on the FPSO and transferred to shuttle tankers for transport to market. The project will utilize a mobile offshore drilling unit, probably a semi-submersible drill rig, for production drilling and maintenance of existing wells.

As presently scheduled, the Proponent expects project approval in the fourth quarter of 2001, with first oil expected in the third quarter of 2004. In order to achieve this schedule, the Proponent based its project team in St. John's, Newfoundland in 1998 and pursued a significant pre-contracting initiative, concurrent with the Development Application process.

1.2 Public Review Process

The White Rose project was subject to review under the Canada-Newfoundland Atlantic Accord Implementation Acts (Accord Acts) and the Canadian Environmental Assessment Act (CEA Act). The review process consisted of three paths – an environmental assessment under the CEA Act in the form of a Comprehensive Study Report (CSR); an internal review by the staff of the Canada-Newfoundland Offshore Petroleum Board (C-NOPB or Board); and a public review of the White Rose Development Application by a Commissioner under the provisions of the Accord Acts. The White Rose Development Application is the first offshore development application to undergo a stand alone public review. This report is the result of the Commissioner's public review process.

On January 15th, 2001, the Proponent submitted its Development Application to the C-NOPB. It consisted of a Project Summary and five additional Part One volumes and eighty four Part Two supporting documents. The Part One volumes are:

- Volume 1 – Canada-Newfoundland Benefits Plan
- Volume 2 – Development Plan
- Volume 3 – Environmental Impact Statement (Comprehensive Study Part One (issued October 2000))
- Volume 4 – Socio-Economic Impact Statement (Comprehensive Study Part Two (issued October 2000))
- Volume 5 – Safety Plan and Concept Safety Analysis

On January 29th, 2001, the C-NOPB appointed Herbert M. Clarke as Commissioner for the public review. The Terms of Reference stipulated that the review would cover all relevant aspects of the proposed and potential development of the White Rose Significant Discovery Area including: human safety and environmental protection considerations; the general development approach; and the benefits accruing to the Province and to Canada, with particular regard to the requirements for a Canada-Newfoundland benefits plan.

The public review process under the Accord Acts was formally initiated on March 16th, when the C-NOPB accepted the Development Application as having addressed the issues in the Development Application Guidelines and provided the completed Development Application to the Commissioner. On the same day, the Commissioner issued a General Notice to inform the public that the Development Application had been referred to the Commissioner and that the public sessions would commence no sooner than 90 days from that date. The Commissioner also published the Terms of Reference (Appendix B) and Operational Procedures (Appendix C) at that time.

The public review process provided two opportunities for the public to make submissions to the Commissioner. The first opportunity addressed the issue of whether additional information should be requested by the Commissioner and provided by the Proponent prior to convening the public review sessions. During this stage, the Commissioner received five submissions by the April 19th, 2001 deadline. (A list of these Initial Review submissions is contained in Appendix D). After considering the public input and conducting his own review of the Development Application, the Commissioner requested additional information from the Proponent on April 26th, 2001 (Appendix E). The Proponent's response was received on June 8th, 2001.

On June 11th, the federal Minister of Environment approved the CSR and referred it back to the C-NOPB as lead Responsible Authority (RA). On the same day, the Commissioner gave thirty days notice of the commencement of public sessions and published a detailed schedule of the public sessions (Appendix F) in accordance with the Terms of Reference.

The public sessions were the second opportunity to make submissions to the Commissioner. The public sessions were the focus of the Merits Review stage which allowed individuals, organizations and the general public to make known views and opinions on the merits of the information and conclusions contained in the Development Application and to present information on the effects of the Project at public sessions.

The provincial Department of Mines and Energy made available $100,000 to assist the public to participate during this stage. Applications for funding had to be received by the Department by May 16th, 2001 and allocation decisions were made by an independent committee. On May 28th, 2001 the Minister of Mines and Energy announced that seven groups received funding ranging from $4,375-$56,625. A list of the participants that received funding is provided in Appendix G.

Ten public sessions were held between July 11th and July 31st, 2001. Public sessions were held in Marystown on July 16th and Clarenville on July 18th. The remaining sessions were held in St. John's. General sessions took place in each location while focused sessions to address Environment, Health and Safety; Production and Transportation Systems; Deferred Development; and, Benefits and the Canada-Newfoundland Benefits Plan were held in St. John's on July 13th, 24th, 25th, and 27th respectively. In addition to presentations from the Proponent at each of these sessions, the Commissioner heard 35 presentations from 29 different individuals. (Appendix H). In total, the Commissioner received 86 submissions at the Merits Review stage. (Listed in Appendix I).

The Commissioner's report represents the culmination of the public review process and is submitted to the C-NOPB, the federal Minister of Natural Resources and the provincial Minister of Mines and Energy as required by Section 12 of the Commissioner's Terms of Reference. This report describes both the input which was received from the public and the Commissioner's own recommendations, with particular regard for the matters considered under the Development Application Guidelines and the Commissioner's mandate under the Terms of Reference.

2 CONTEXT OF THE WHITE ROSE PROJECT

Exploration of the continental shelf structures of the Newfoundland and Labrador offshore area commenced in 1966. The first major discovery was the Hibernia field, discovered on the Grand Banks by Chevron Canada Resources Limited in 1979. Other discoveries followed, including in 1988 the discovery of the White Rose field by Husky Oil. During the 1970s and early 1980s there were high expectations of the positive effects that the oil industry would have on the provincial economy. During these heady days, it was sometimes viewed as a panacea for Newfoundland's chronic economic problems.

The ownership and control of the natural resources of the continental shelf was the subject of a bitter jurisdictional dispute between the federal and provincial governments. The Supreme Court of Canada ruled in the 1984 *Newfoundland Offshore Reference* case that the Government of Canada had exclusive jurisdiction over mineral rights on the continental shelf beyond the territorial sea. Despite this ruling, the province successfully negotiated a joint management and revenue-sharing arrangement called the Atlantic Accord that was signed on February 11th, 1985.

The Atlantic Accord was implemented by the enactment of reciprocal legislation at the federal and provincial levels in 1987. Pursuant to that legislation the governments established an independent board, the Canada-Newfoundland Offshore Petroleum Board, to manage the exploration and development of the petroleum resources of the Newfoundland offshore area in accordance with a series of broad policy objectives, including that the province would become the principal beneficiary of those resources. Both the Atlantic Accord and the legislation provided that as a general rule any proponent of a project proposed in the Newfoundland offshore area would be required to prepare and submit a benefits plan to the Board for approval prior to the approval of a development plan for exploiting the resources it had discovered. These measures were designed to ensure that the Province of Newfoundland would eventually enjoy the same level of economic independence currently experienced by other provinces in the confederation.

Hibernia was the first project approved for development in the Newfoundland offshore area. Of particular note is the fact that the Hibernia Canada-Newfoundland Benefits Plan was prepared in the context of a "negotiated agreement" between the project owners and the two levels of government. That agreement specified the royalty arrangements for the project as well as certain industrial and employment benefits that the project was required to provide, including the construction of a concrete gravity base structure (GBS) in the province. Despite major criticism from oil industry observers, the project phase was executed from 1990-1996 and had a very positive impact in terms of direct provincial employment, offsetting a decline in fishing industry employment over the same period. The Hibernia Platform entered production in 1997 and is currently a very viable project.

The Terra Nova oil field was discovered in 1984. The Terra Nova Canada-Newfoundland Benefits Plan was prepared and submitted in 1996, also following a "negotiated agreement" between the Proponents and the Province with respect to royalty arrangements and benefits commitments relative to the project. This negotiated agreement was subsequently incorporated into the Terra Nova Benefits Plan. The Terra Nova oilfield is smaller than Hibernia and the Proponents portrayed the Project as one with "relatively tighter margins" than Hibernia. The Proponents of the Terra Nova project proposed the use of FPSO technology with a large international component in the construction phase rather than a GBS which would have resulted in greater local content, including significantly higher direct employment. Terra Nova will enter production later this year after experiencing budget overruns and time delays.

The White Rose field was discovered in 1988. It contains significant gas resources as well as oil. The White Rose Development Application is to develop the oil reserves only. It is the first development to be proposed without a negotiated agreement with the two levels of government. The royalty regime for White Rose will be the Province's generic royalty regime and the only benefits provisions for the Project are those put forward by the Proponent of its own volition in its Canada-Newfoundland Benefits Plan. The Proponent has emphasized in its Development Application that White Rose is a smaller field, having one-half the oil reserves of Terra Nova and about one-quarter those of Hibernia, and is therefore much less able to withstand cost overruns like those experienced by the Terra Nova project. The proposed mode of development is an FPSO that will require much of the fabrication to be done internationally. Based on its current schedule, the Proponent expects to produce first oil by the third quarter of 2004.

Experience with previous projects has informed much of the public discussion about the White Rose Project. The high direct employment associated with Hibernia and concerns with respect to offshore safety evoked in no small part by the Ocean Ranger tragedy provide some insight into the debate over the mode of production for the Project.

The importance of ocean resources is also an important backdrop for this review of the White Rose Project. Oil spills and other environmental issues associated with offshore development are a concern for many people. Our experience with the harshness of the waters off our shores also brings to mind safety concerns for offshore facilities.

Benefits issues are ever present in a discussion of offshore oil development. The people of the Province have experienced a number of highs and lows related to offshore oil development. While significant benefits resulted from Hibernia and Terra Nova, a number of Participants spoke of missed opportunities and expressed disappointment that the industry remains one of stand-alone pioneering projects which offer limited and sporadic opportunity. Clearly, the sustainable offshore sector and associated economic development has not yet developed as had been anticipated by many.

Two of four major discoveries have been developed. After White Rose, the fourth discovery – Hebron - is on the horizon. Preparations are underway to begin development of this field. Further, there is much anticipation about the prospects for planned

exploration in the deeper waters of the Flemish Pass area and off the south coast of the island.

In this context, concern was expressed during the public sessions not only for White Rose, but for the trend for the whole offshore industry in Newfoundland. Participants recognized that the full extent of their concerns cannot be addressed by the White Rose Project alone, but it is understandable that these larger issues were raised and that this context must be considered in this review process.

3 GENERAL DEVELOPMENT APPROACH

The Terms of Reference require the Commissioner to conduct a public review of the White Rose Development Application that will include a review of *"the general approach to the proposed and potential development and exploitation of the petroleum resources within the White Rose Significant Discovery Area"*.

This chapter discusses the Proponent's proposed Development Plan including its preferred production and transportation system and its deferred development plans for the White Rose SDA. In addition, project economics are analyzed and the Proponent's contracting strategy discussed. Recommendations are made in each area.

3.1 Description of Development Plan

The legislation requires the Proponent to prepare and file a written Development Plan containing information relevant to this part of the review. The White Rose Development Application Volume 2: Development Plan refers. During the course of the public review process further detailed information was provided to the Commissioner to allow for the comprehensive review mandated.

3.1.1 Geology and Resources of the White Rose SDA

The White Rose Significant Discovery Area (SDA) is located in the Jeanne d'Arc Basin. This Basin encompasses an area of about 10,500 km^2, and contains virtually all the significant hydrocarbon discoveries on the Grand Banks to date. The Jeanne d'Arc hydrocarbons are found in a series of formations common to each of the fields in the basin. In the White Rose SDA, reservoir quality sandstones have been encountered in four formations, the Avalon, South Mara, Eastern Shoals and Hibernia, with the most economically significant discoveries being found in the Avalon formation.

The White Rose Avalon reservoir is divided by faults into three separate pools: the South Avalon, West Avalon and North Avalon Pools. The South Avalon Pool is the largest in area and, based on the most recent information from the Proponent, has 69% of the original oil in place (OOIP) in the Avalon reservoir. The West Avalon Pool is slightly smaller in area and contains 18% of the OOIP, and the North Avalon is the smallest pool and holds 13% of the OOIP in the reservoir. The oil in place is a typical Jeanne d'Arc waxy crude with an average quality of 30^o API. The North Avalon Pool contains the most economically significant discovery of natural gas, with more than half of the original gas in place (OGIP) and an estimated volume of 1.2 tcf.

In addition to calculating OOIP and OGIP for the full field and for each pool, the Proponent has used reservoir simulation models to assess various reservoir depletion options, and with other techniques, to develop probabilistic recovery factor ranges and volumes of recoverable oil and gas. Only the South Avalon Pool has had sufficient delineation drilling to prove up the volumes of oil to the status of reserves. In all other

cases the Proponent has classified the recoverable volumes of oil and gas in the White Rose SDA as resources. Table 3.1 shows a comparison of 'in place' and 'recoverable' volumes of oil. The Proponent's estimate of recoverable gas is 1.8 tcf.

Imperial – Millions of Barrels			
Pool	**P90**	**P50**	**P10**
South Avalon			
OOIP	715	779	844
Recovery Factor	23	30	36
Reserves	181	230	283
West Avalon			
OOIP	153	199	254
Recovery Factor	18	25	32
Resources	37	49	64
North Avalon			
OOIP	116	142	169
Recovery Factor	19	24	29
Resources	26	33	42

Table 3.1
Comparison of In Place and Recoverable Volumes

The recoverable volumes of oil may be lower at White Rose than at other fields in the basin, but advances in drilling technology and the use of horizontal wells have made the South Avalon Pool, with its large, thick oil zone of approximately 120m, an economically attractive project for the Proponent.

3.1.2 Production System

The production system consists of a floating production, storage and offloading facility and a subsea system of wellheads and flowlines with the wellheads located in glory holes to guard against iceberg scour. A mobile drilling rig is used to drill the wells and the oil is offloaded using shuttle tankers. Figure 3.1 shows a schematic of the entire production system.

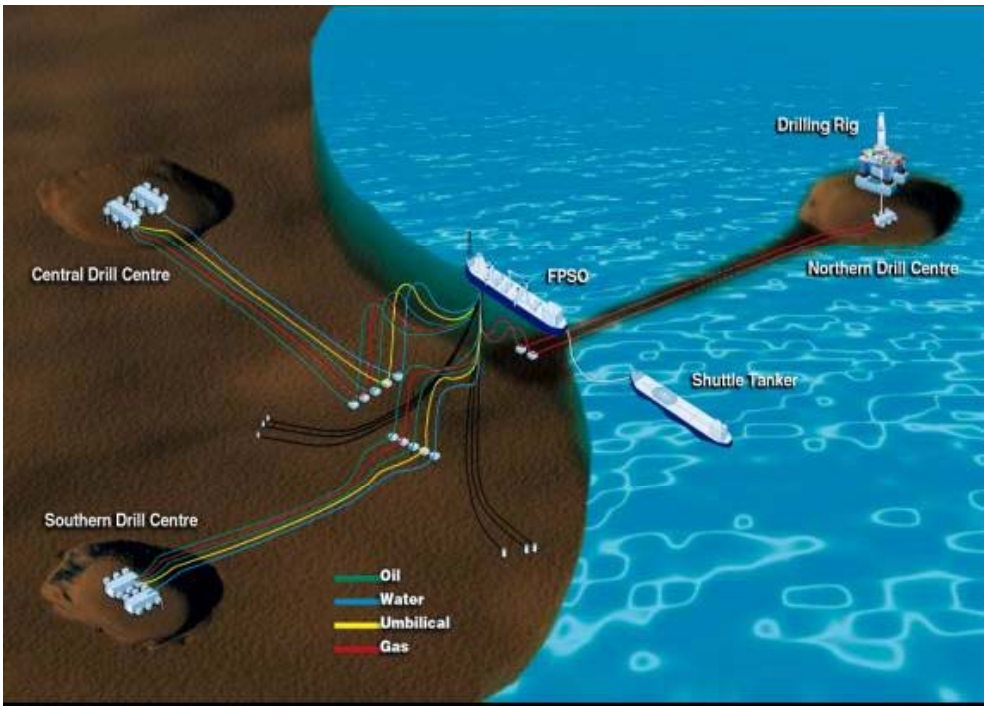

Figure 3.1
Schematic of Production System

FPSO

A floating production, storage and offloading (FPSO) facility is the Proponent's preferred development concept. FPSO facilities are currently in use in numerous locations around the world. The FPSO facility for White Rose will be a new-build steel FPSO based on the hull design of the Hibernia shuttle tankers. The vessel will be similar to the Terra Nova FPSO with approximately 20% less topsides weight. It will have daily production capacities of 100,000 barrels of oil, 150 million cubic feet of natural gas, and 180,000 barrels of water. Oil storage capacity will be 960,000 barrels. It will be moored in approximately 120 metres of water using a passive mooring system with no thrusters or propulsion necessary to maintain the vessel on station. The FPSO will be positioned between the glory holes (e.g. Central Drill Centre, Southern Drill Centre) and connected to the production facilities by means of flowlines and risers, which will be connected to the turret via a disconnectable spider buoy.

The FPSO is designed for a target service life of 20 years. The design features of the FPSO will allow it to maintain production during one-year storm conditions and moderate sea ice up to 50% cover. The vessel is also intended to remain at its moorings in 100-year storm conditions and is designed to withstand the impact of a 100,0000 ton iceberg. The turret mooring will disconnect utilizing a quick connect/disconnect system to allow for disconnection both in planned circumstances and in emergencies. The FPSO rotates or weathervanes around the stationary turret to encounter minimal wave and wind conditions. The mooring and riser system is shown in Figure 3.2.

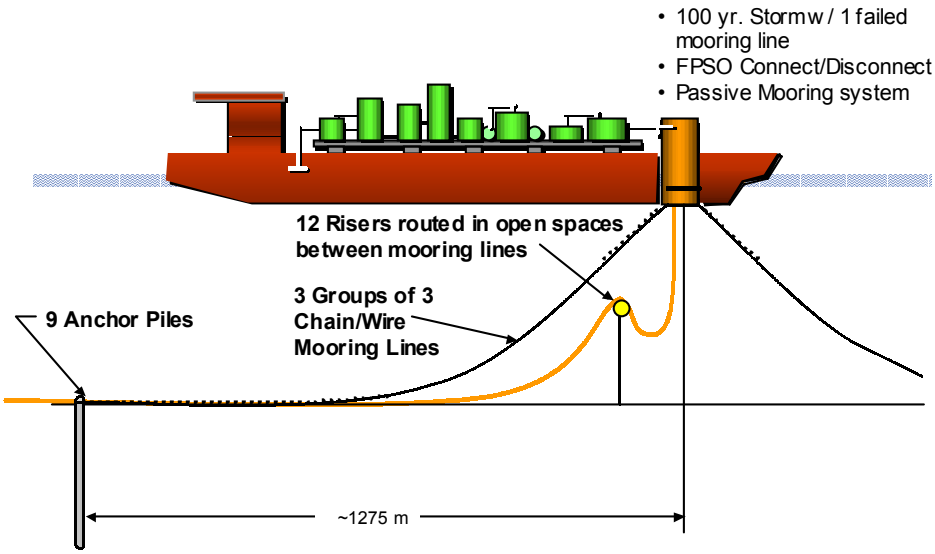

Figure 3.2
Mooring and Risers (Generic)

FPSO hulls and topsides are normally constructed separately and mated at a shipyard or hook-up facility. The Proponent states that the hull can only be constructed at a large international shipyard. Topsides components however can be built in fabrication yards and smaller shipyards in Newfoundland and other parts of Canada. The turret, which provides the link between the vessel and the production facilities, is built in two sections, one of which is built directly into the hull and the other lifted on later. The FPSO hull for White Rose, as proposed, would be a fully operational seaworthy vessel upon leaving the shipyard, with a steel plate covering the bottom of the built-in turret section.

Topsides

The topsides of an FPSO are normally built in a modular design. In the case of White Rose, the present topsides design calls for 16 pre-assembled units (PAUs) that will contain the components necessary to process the oil and gas. The topsides process unit is designed to separate and process the oil and transfer it for storage in the hull prior to offload to the tankers for export. The topsides will treat seawater for injection into the reservoir, separate the produced water from the production fluids and treat that water to applicable environmental standards prior to discharge overboard. The topsides will also separate and compress gas for re-injection into the North Avalon Pool for potential future development. Finally, the topsides will contain a power generation and distribution system, a utility system, a mechanical handling system, and the integrated control and safety system for the FPSO.

Subsea Production Facilities

The subsea wells for White Rose include a series of production, water injection and gas injection wells located in three drill centres, each in a large excavation on the seabed known as a glory hole. Glory holes are deemed to be necessary on the Grand Banks to

protect the facilities from iceberg scour. While the base case development for White Rose calls for 15 wells, the potential exists for a total of 25 wells over the life of the project. The glory hole excavations are therefore designed to support all potential wells as well as future potential gas production from the White Rose SDA.

The subsea wells are tied back into manifolds that collect production fluids. From the manifolds, the production fluids are brought back to the FPSO through a series of flow lines and dynamic risers. The subsea equipment, both down-hole and on the seabed, is managed through control umbilicals which provide power, hydraulic and data links to the subsea system.

At present, the Proponent intends to insulate the flowlines which it maintains will reduce the need for a trenching solution for White Rose. A number of presenters at the public sessions expressed concern regarding the existence of 'hard pan' at the Terra Nova field and its potential presence at White Rose. The Proponent however, is satisfied that based upon its sampling the soil conditions at White Rose are much more favorable for excavation than at Terra Nova, should it be required.

Drilling

The FPSO does not include a drilling unit, so a mobile offshore drilling unit (MODU) probably a semi-submersible rig will be used to drill the necessary wells. The Proponent intends to employ horizontal wells with an average well length of 5,500 metres, including an average horizontal section of 2,100 metres. The wells on average will cost $50 million each. They will be drilled in approximate water depth of 125 metres and will produce oil from 3,000 – 3,500 metres beneath the seabed. Figure 3.3 shows a typical White Rose production well, including the horizontal well section with perforated piping to permit production from the oil reservoir.

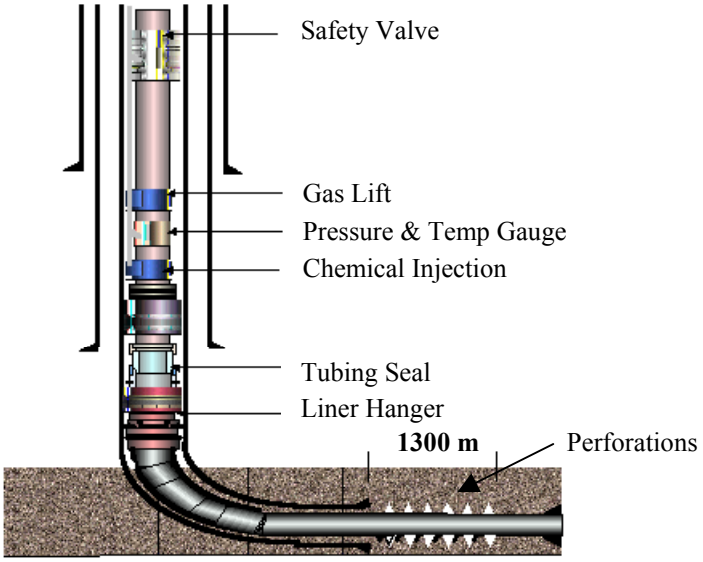

Figure 3.3
White Rose Production Well

Export System

Oil produced from the Avalon pools will be processed through the topsides process units, stored in the FPSO, and exported using shuttle tankers. The Proponent estimates that one to three tankers will be required, depending on synergies with other projects. The tankers will be double-hulled and double-bottomed vessels that will be bow loading and capable of connecting to the FPSO offloading system in significant wave heights. At this stage it is not known whether the tankers will be ice re-enforced or not. According to the Proponent, this will depend on the response to bidding requests.

3.1.3 Production Plan

As indicated, the Proponent is seeking approval to initially produce oil from the South Avalon Pool only. The Proponent proposes use of a waterflood method by which treated seawater will be injected into an underlying water leg to force the oil upwards to horizontal production wells. The gas produced from the production wells and not used for fuel will be re-injected in the North Avalon Pool for conservation. The base case is for 15 wells, 9 drilled prior to first oil and 6 following. These consist of 8 production wells, 5 water injection wells and 2 gas injection wells in the North Avalon Pool for the conservation of excess produced gas. The proposal also calls for some gas injection into the South Avalon Pool, primarily in the latter stages of production, in order to maintain a constant reservoir pressure and optimize oil recovery.

Production is expected to commence in the third quarter of 2004, reach peak production of 33.6 million barrels for year two (2005), and continue at that level for four years. In year six (2009), production is projected to drop to 24.6 million barrels and continue to

decline from there unless new reserves are brought in from deferred developments. If the South Avalon development is successful, the Proponent intends to extend its oil production into the West Avalon and North Avalon Pools, ideally by drilling oil production wells in those pools just prior to the South Avalon Pool coming off its production plateau.

3.2 Concept Selection

In late 1999, Husky Oil contracted with Kvaerner SNC Lavalin Offshore (KSLO) to conduct a concept selection study for the White Rose field. The study's objectives were to evaluate the technical and commercial merits of a variety of platform solutions including floater and bottom-founded options. KSLO worked closely with the Husky Oil team in St. John's. Eight options were evaluated using criteria based on technical considerations, capital costs, construction time, concept maturity, concept deliverability, and risk considerations. The study, completed in March 2000, concluded that the preferred option for developing the White Rose oilfield was a steel FPSO facility using subsea wells located in glory holes, similar to that selected for the Terra Nova development.

3.2.1 Evaluation of Proponent's Concept Selection Decision

Despite a clear statement to the contrary at page 277 of the Proponent's Development Plan, Canada-Newfoundland benefits were not considered at all in the concept evaluation exercise. The Proponent confirmed this during the public review sessions, and on several occasions stated its position that the production system decision has to be made only on economic and technical considerations, which it believes is consistent with the Development Application guidelines.

The Commissioner appreciates the Proponent's position and would strongly agree that benefits considerations should not be permitted to compromise technical integrity nor render a project uneconomic. Nevertheless, in line with the Commissioner's position on bid evaluation as stated in Chapter 4, the Commissioner believes there is merit in looking at Canada-Newfoundland benefits considerations as part of the corporate culture in doing business offshore the east coast, and merit in including benefits considerations in all decision making. Including benefits considerations in this selection exercise may not have changed the result. However, it most certainly would have provided a more complete analysis and thus reduced a number of the concerns, indeed, consternation expressed on this issue at the public review.

During the public review process, participants and the Commissioner raised various concerns regarding the preferred mode of production. For the most part, discussions on these matters took place on Day 6 Focus Session: Development Plan – Production and Transportation System. In summary, these concerns can be grouped into three main issues:

- The FPSO is the Proponent's preferred choice for developing the South Avalon oil pool, but is it still the best technical and economic option when

deferred developments, including gas production, are considered? Is it the best option in terms of Canada-Newfoundland benefits?
- Is the FPSO safe and reliable with a proven track record in harsh environments around the world, and is it suitable for our environment?
- Are the cost figures accurate? Given developments since March 2000, are the cost estimates for the FPSO still reliable? Are the comparisons with other options still valid?

Suitability of Preferred Choice

Several presenters questioned the Proponent's choice of options and suggested that a concrete gravity based structure (GBS) is more suitable for our harsh environment, would result in more employment and industrial benefits locally, and would permit earlier development of the gas resources. In response, the Proponent displayed charts of world trends clearly showing the FPSO being chosen as the offshore development choice much more frequently in recent years than the GBS. Field size and water depth are factors, with the GBS normally being used for larger fields and in shallower water, while the FPSO is used for smaller fields and/or in deeper water. According to the information presented, there are some 24 FPSO facilities (average field size of about 100 million barrels or equivalent) and 7 GBS facilities (average field size of 1.7 billion barrels) presently operating in water depths of 100 - 150 meters. These trends are interesting and an important consideration, but it has to be noted that the numbers in and of themselves do not pre-determine that a GBS cannot be used for White Rose with proven reserves of 230 million barrels of oil in the South Pool and additional oil and significant gas resources in the other pools.

With respect to gas production, the Proponent points out that the FPSO has been designed to handle up to 150 million cubic feet of gas per day to re-inject into the North Pool for later production. Modifications would have to be made to the topsides to enable this capacity on the FPSO to be used to export gas to a pipeline. The FPSO would have to discontinue operations for a period and come to shore for these modifications. This matter is discussed further in section 3.3, Deferred Development.

Abandonment is an additional factor in that abandonment of a GBS is considered to be much more costly and physically challenging. At this stage, no GBS has been successfully abandoned and no one has yet worked out how to do it. (It is surprising really that so little attention was paid to this issue in the past, but it is receiving increasingly more attention from regulatory bodies and from the industry generally.) Unless and until this matter is further resolved, the GBS is at a disadvantage *in this respect* compared to the FPSO.

In terms of benefits, the Proponent stated that "the FPSO provides better opportunity for Newfoundland fabrication facilities; supports work force continuity with current projects; provides skill and technology development for smaller fields; and export opportunities for these capabilities." Of course these statements are only significant if the opportunities are realized. Recommendations to this end are made in Chapter 4 on Canada-Newfoundland Benefits. The Proponent does admit that the GBS, if chosen, would

provide more benefits during the project construction stage but goes on to state that the White Rose project will not proceed with a GBS.

Proven Track Record

The Commissioner and others at the public sessions have questioned the accuracy of the Proponent's statement that the FPSO is "safe and reliable with a proven track record in harsh environments". The Terra Nova FPSO, which has been promoted by that project's operator as the first of its kind in a number of important areas, has only recently moved to its location on the Grand Banks and has not yet started production. In response to questions on this matter, the Proponent of the White Rose project stated that while the way individual elements have been brought together for Terra Nova is different, the individual elements are all comprised of existing technology. The major difference concerns the operation of the FPSO in the presence of ice and icebergs and the fact that while there are a number of disconnectable turrets in use elsewhere in the world, the Grand Banks are unique in that there is a specific requirement that the disconnect be done quickly. The Proponent also pointed out that some reassurance should be taken from the fact that the C-NOPB and all of the other regulatory bodies have approved the Terra Nova FPSO. The Proponent states that it is *proven technology* in that it has been *proven* to the C-NOPB. The fact of the matter is that there is no actual experience with an FPSO moored in a stationary position in the harsh but sensitive environment of the Grand Banks. Concerns were also raised related to green water, structural stress and fatigue, disconnect procedures and ice management. These concerns are legitimate. They are addressed further and recommendations made in Chapter 5.

Cost Estimates

The Proponent's cost estimates for the FPSO option have been the subject of considerable attention during the public review and it is obvious that the Proponent has gone through great pains to ensure that its numbers for this option are as accurate as possible. In view of the fact that the actual costs of the Terra Nova FPSO had increased significantly and significant time delays were experienced with that project, the Commissioner had raised questions on this matter as part of his additional information request in April. The Proponent, too, found it necessary to re-visit the issue for this reason and, as well, the Proponent was aware of the actual *as bid* cost data it was receiving from its bidding processes. Further, as was disclosed at the public sessions, the Proponent had been provided with reports indicating that new design and new processes had resulted in reducing both the estimated costs for GBS construction and the estimated construction time. The Proponent conducted its review in the spring and early summer of 2001. As a result, the Proponent's new capital cost estimate for the FPSO is $2.07 billion, compared to $2.16 billion in the KSLO study and its October 2000 target of $1.95 billion.

One might have expected that the FPSO estimates would have increased significantly because of the Terra Nova experience, since the KSLO numbers were based, to some extent, on early Terra Nova numbers. This was not the case. The project co-venturers (both partners in Terra Nova as well as in White Rose) obviously have all the relevant information available to them. According to Husky Oil, the final figures on the Terra

Nova development are in the range of $2.7 billion as compared to the estimate at project sanction of $1.9 billion, an increase of $800 million. Why then does the Proponent now believe it can bring in the White Rose project for about $2.1 billion?

The reasons given by the Proponent are that the field is smaller, fewer wells are required, the topsides and subsea equipment requirements are reduced and it has learned from the Terra Nova experience. As a result, the hull is based on the known shuttle tanker hull, more soil testing has been done at the site and an improved glory hole excavation technique will be employed. Improvements have been made in the topsides design and in the interfaces with the hull and turret. Finally, the Proponent believes it is utilizing an improved contracting strategy compared to the alliance concept used by Terra Nova.

It also appeared reasonable to expect that the revisited estimates for the GBS would have decreased, or, at least have stayed approximately the same, based on the new concrete construction techniques reported in technical papers and elsewhere. Such was not the case either.

The Commissioner has found it extremely difficult to follow the different numbers presented by the Proponent in various reports, documents and presentations regarding the GBS option. The KSLO report estimated a capital cost of approximately $2.4 billion. In the Proponent's June 8th response to the Commissioner's additional information request, the estimated capital cost of the GBS option had increased by $800 million to approximately $3.2 billion. In addition, the estimated cost for abandonment had increased from $150 million to $500 million.

The Proponent's justification for these increases was provided during the public review sessions in July. It became quite clear that if the Proponent's new estimates are accurate, then the KSLO report is terribly flawed, at least in respect to the GBS option. The report, which had been put forward by the Proponent without qualification in the Development Application and elsewhere as the definitive concept selection study, had underestimated the weight of the GBS topsides by 50%, had underestimated the cost per ton of steel construction, had overestimated the required size of the concrete structure itself by 80,000 cubic meters of concrete (55%), and, according to the Proponent, had utilized an incorrect development approach for the project.

The Proponent, to its credit, prepared a further review, MR-070, dated July 27th, 2001 that attempted to summarize its current estimates, normalize or rationalize the different numbers in the various reports, and resolve the various inconsistencies. Unfortunately, this report led to many further questions, some of which are still outstanding in the Commissioner's mind. These concerns were outlined in a question and answer period on Day 10 of the public sessions and it is not necessary to repeat them here. At that time the Proponent stated that the problems with the KLSO study were known in March 2000 but no attempt was made to correct them as in its view the GBS option was already ruled out and any corrections would have only made the comparison worse.

The Proponent must have been aware of the sensitivity of the FPSO versus GBS issue and of the wisdom in dealing with it properly and thoroughly. However, it is clear that

the same thought and study did not go into each. The Commissioner is convinced that the Proponent has a good understanding of the numbers for its proposed FPSO, but there are unanswered questions about the comparative GBS numbers. Resolving this is an unfair burden to place on the shoulders of Participants in the public process. The Proponent had other opportunities to resolve this matter after the Commissioner's question of April 26th, either in the June 8th response and/or the July public sessions.

In actual fact, the Proponent did not do a good job on an issue that it must have known was extremely important to the public and to many participants. Several presenters, including the Friends of Gas Onshore (FOGO) and the Newfoundland and Labrador Building and Construction Trades Council, have called for an independent engineering audit or similar process. They also reminded the Commissioner of the considerable cost overruns actually experienced for both the Hibernia and the Terra Nova developments, when compared to the original estimates.

Having said all of this about the different cost estimates for the GBS option, it is not determinative in the final analysis regarding the Proponent's position for this particular Development Application given the current knowledge of the resources. In summary, the Proponent's estimated capital cost of its preferred production system option, an FPSO, is approximately $2.1 billion and its estimated cost of a GBS option is approximately $3.2 billion. In addition the Proponent points out that, unlike with the FPSO, there is the challenging and costly GBS abandonment issue ($500 million estimated). There may be some operating costs advantages to the GBS but they are small compared to the capital cost disadvantages. It is the Proponent's clear position that the GBS option is uneconomic and it will not be built for the White Rose project.

3.2.2 Alternative Development Plan Proposal

One participant, FOGO, presented an alternative development plan for the White Rose Significant Discovery Area. The plan was prepared for FOGO by Genesis, a UK consulting firm. Using proprietary software developed for concept selection studies, Genesis tested or bench marked its model by using input from the KSLO concept selection study to duplicate, in terms of rate of return, the Proponent's FPSO field development option. Next, based on the KSLO estimates for the GBS, Genesis generated an oil-only option with comparable results to the FPSO option. It next looked at two cases. One was a gas hub GBS on the location of the North Pool in combination with the proposed FPSO South Pool oil system. The other was a stand alone GBS to produce both the oil and the gas for White Rose. Both options pick up the gas from Hibernia and Terra Nova and transport it to market by way of a pipeline system, the cost of which is included in the estimates. According to the presentation, these options produce combinations with comparable rates of return to those for the Proponent's oil only system and deserve serious consideration and further engineering work. Overall capital cost estimates are approximately three times the CAPEX for the oil only option.

The methodology used is quite interesting and appears sound. However, three major problems became apparent during the Day 6 presentation and discussion. First, the input

data used for the GBS option was taken from the KSLO study, which was considerably defective in this regard as previously mentioned. Second, certain assumptions on gas tariffs, markets and rates are questionable. Third, while there are widely different levels of optimism regarding gas, the quantities required (approximately 5 tcf under the FOGO proposal) have not been sufficiently delineated to be considered proven at this stage. The issue of gas is considered in further detail in section 3.3, Deferred Development.

3.2.3 Future Developments / Technology Transfer

Over the course of the public review sessions, the Proponent provided submissions relating to the manner in which future development was likely to proceed in the Newfoundland offshore as a further rationale for the approval of the FPSO production system at White Rose. The Proponent suggested that, based on past oil industry experience, it was highly likely that the larger fields have already been discovered in the Jeanne d'Arc Basin and that any new discoveries would therefore be smaller than Hibernia, Terra Nova and presumably White Rose. The Proponent also submitted that exploration efforts in the Newfoundland offshore were concentrating in deeper waters in the Flemish Pass area and off the south coast of the Province. Furthermore, the global trend indicated an increasing use of FPSO facilities where fields are smaller and water depths are greater, as noted previously. The Proponent therefore submitted that the approval of an FPSO for White Rose would encourage the long term sustainability of the offshore oil industry in the Province, because the technology to be employed in future in the Newfoundland offshore would likely be based on FPSO facilities.

Other presenters took the view that utilization of GBS technology is safer and more suitable in our harsh environment, and would provide much greater local benefits during the project phase. Given the lower capital costs which could be expected in the future from design modifications and new construction techniques, it was submitted that the GBS technology was viable even for the smaller projects such as White Rose. In their view, GBS technology had been proven successful in the Newfoundland offshore and should continue to be employed in certain situations such as for the gas hub for the future gas development in the Jeanne d'Arc Basin or for the Hebron development.

In the Commissioner's view, it is highly desirable that a determined and focused effort be made to better understand the various issues involved in and the viability of each technology for future developments. Accomplishing such a goal would benefit all stakeholders including proponents. The Province would benefit in terms of maximizing benefits from future developments and in moving towards the long-term sustainable industry it desires. The existing local industry would benefit in terms of more focused technology transfer and research and development initiatives. The C-NOPB and the proponents would see benefits through a more efficient planning and approval process for Development Applications.

If it were ultimately determined that the most likely scenario for the future is that the Newfoundland offshore will generally utilize FPSO technology, for example, this knowledge would bring greater focus and impetus to all stakeholders in their various

capacities in working towards common goals in terms of benefits. In such an environment, Canadian and Newfoundland suppliers and fabricators could focus their energies on developing expertise in turret manufacturing and installation, sub sea completion systems and marine equipment for hulls and on expanding their capabilities in topsides fabrication. The utility and desirability of a process that would identify and define the elements of the industry of the future including the preferred mode of development, although possibly outside the Terms of Reference, is patently obvious to the Commissioner.

3.2.4 Conclusions and Recommendations

With respect to this project, it is the Commissioner's conclusion that, while the concept selection study was flawed in its analysis of the GBS option and limited in that it did not include benefits considerations, the FPSO option is the most cost effective for the White Rose project as currently configured.

The FPSO is a maturing technology, still with no actual experience in our environment, and developments in the technology and its performance need to be monitored closely by the C-NOPB. Some legitimate environment and safety concerns have been identified. These are dealt with in Chapter 5.

Further, the Proponent has stated that its proposed design of the FPSO can accommodate planned deferred oil developments. With modifications, the facility can also export a certain amount of gas when gas transportation facilities are available. This aspect is discussed in more detail in the next section of this chapter. Finally, the Proponent could have avoided a lot of consternation had it conducted and provided a fair comparison between the FPSO and GBS options in terms of Canada/Newfoundland benefits. Nevertheless, construction and operation of the FPSO based production system can provide significant Canadian and Newfoundland benefits, if this matter is tackled in the manner recommended in Chapter 4.

Several presenters had so little confidence in the technical and cost data presented by the Proponent on the FPSO and GBS modes of development that they called for an independent engineering review and recommended that the project be delayed until the results of that review are known. While the Commissioner, for reasons mentioned earlier, does not feel delaying the project for this reason is justified, he does feel it is essential that the matter be addressed by all stakeholders so that this is not an issue in future Development Application reviews. An obvious way to do this is to construct a different time frame and forum in which to address all aspects of the FPSO versus GBS question for potential offshore Newfoundland projects and to reach consensus on the likely utilization of each in the foreseeable future. A properly planned and scheduled high quality engineering and technical conference would seem appropriate. The initiative and the responsibility for organizing and conducting such a conference would be normally undertaken by government, but to be successful the full support and participation of the other stakeholders (C-NOPB, oil and gas producers, supply/service and construction/fabrication industry, organized labor, pipeline companies, and the

general public) is essential. Further, once the outcome of such a transparent and thorough review is known, the logical follow-up would be preparation and adoption of a plan for the industry of the future.

Recommendation 3.1
The Commissioner recommends that, subject to related recommendations on safety (5.2, 5.3, 5.4, 5.5 and 5.6), the Proponent's preferred production system concept of a Floating Production Storage and Offloading system (FPSO) and subsea completion system with flowlines and risers connected to a quick disconnect turret be approved by the Board for the White Rose Development.

Recommendation 3.2
The Commissioner recommends that the Board consider the FPSO not as a mature technology, but as a maturing one, and furthermore that the FPSOs at Terra Nova and White Rose be closely monitored in relation to research on this technology ongoing elsewhere in the world and with particular focus on the aspects unique to our environment.

3.3 Deferred Development

The White Rose Significant Discovery Area consists of several oil and gas pools, the most significant of which are found in the Avalon formation. The Avalon Reservoir is divided by faults into three separate pools, the South Avalon Pool, the North Avalon Pool, and the West Avalon Pool. See Figure 3.4.

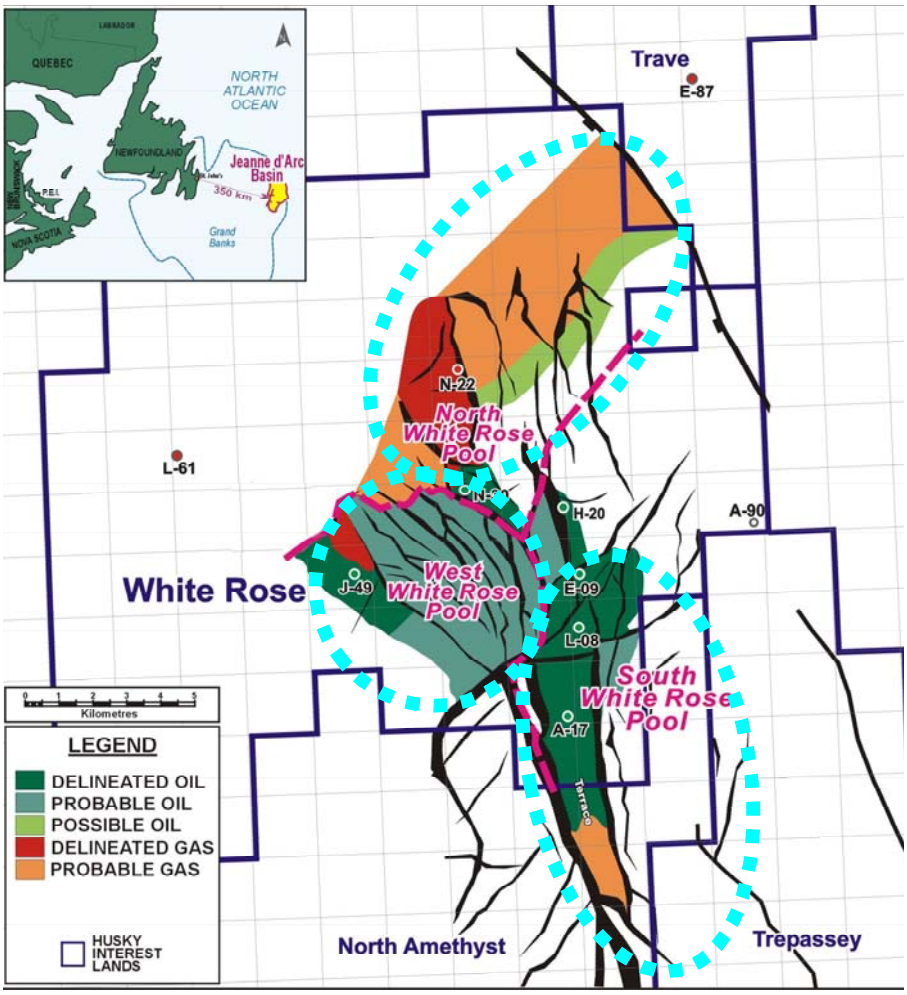

Figure 3.4
Reservoir Delineation

The Proponent's proposal is to develop the oil of the South Avalon Pool only. Its current estimates for that pool are 779 million barrels of original oil in place, a recovery factor of 30%, and recoverable volumes of 230 million barrels. Based on the results of the South Avalon development drilling, production and injection, the Proponent will consider three deferred developments, namely: North Avalon oil, West Avalon oil, and White Rose gas resources.

Day 7 of the public review was devoted to the focus session entitled Development Plan – Deferred Development as it was considered important by the Commissioner to better understand what is known about the development potential of other resources in the White Rose Significant Discovery Area and the prospects for their development. It is obvious that the addition of any oil volumes to those expected from the South Avalon Pool could significantly and positively impact the economics of the project and extend its life, with all of the resulting benefits that accrue generally. As well, there is the important question of gas development. At the focus session, the Proponent presented a significant amount of new information. The Commissioner considers this to have been very useful to him and to the process generally.

3.3.1 Oil Resources

The current P50 estimate of the recoverable oil volumes from the North Avalon Pool and the West Avalon Pool is 82 million barrels, taken together. A 'P50 estimate' is the number at which there is an equal chance that the actual result could be bigger or smaller than the estimate.

The North Avalon Pool is comprised of several fault blocks. Here, the Proponent expects a large gas cap, a thin oil leg and generally poor reservoir quality compared to the South Avalon Pool. Preliminary assessments included in the Development Application have been revised and the Proponent currently estimates a recovery factor of 24% and a recoverable oil range between 26 and 42 million barrels. The P50 estimate is 33 million barrels.

The West Avalon Pool has several fault blocks and is also expected to have poorer reservoir quality than the South Avalon Pool, but probably not as poor as the North Pool. The Development Application states that the southeastern end of the pool has the best potential for economic oil production. Again, the Proponent has revised the preliminary estimates to a recovery factor of 25% and a recoverable oil range between 37 and 64 million barrels. Here the P50 estimate is 49 million barrels.

Figure 3.5 shows the recoverable oil volume ranges for each pool and a comparison of the Proponent's total estimates and the P50 estimate of the C-NOPB.

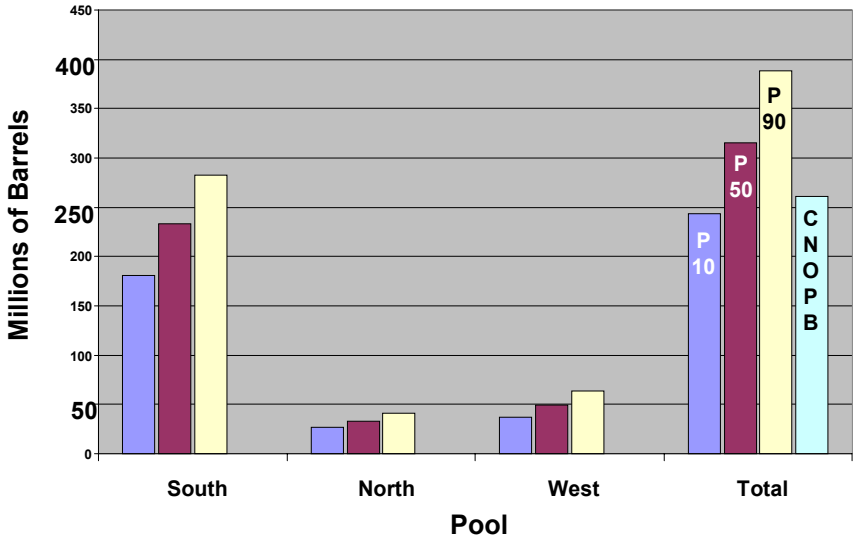

Figure 3.5
Recoverable Oil Volume Ranges

Deferred Development Plan For Oil

The Proponent's plan for developing the oil resources of the North and West Pools was outlined during the focus session on deferred development.

Between 3 and 6 delineation wells, each costing approximately $25 million, are needed to prove up these resources. A decision to proceed with delineation of either pool would be influenced by the information obtained from the South Avalon development wells and subsequent production performance. In the case of the North Pool, additional information will come from additional seismic and from the gas injection process. One of the gas injection wells will be drilled prior to the start of production and the other will probably be drilled within one year of the start of production. Thereafter, development decisions will be made on the basis of their delineation drilling.

The Proponent believes that development of the North Pool will likely require at least 3 horizontal production wells using gas injection for pressure support. The West Pool is a relatively large area with extensive of faulting. Its development will require several horizontal wells using water and/or gas for pressure support. Existing glory holes could be used for at least some of the wells. Ideally, oil production wells in these pools would be drilled prior to the South Avalon coming off its plateau levels of production. This would allow the FPSO to continue to be used at capacity levels for a longer period of time and help extend the economic life of the South Avalon Pool, thereby increasing recoveries from that pool.

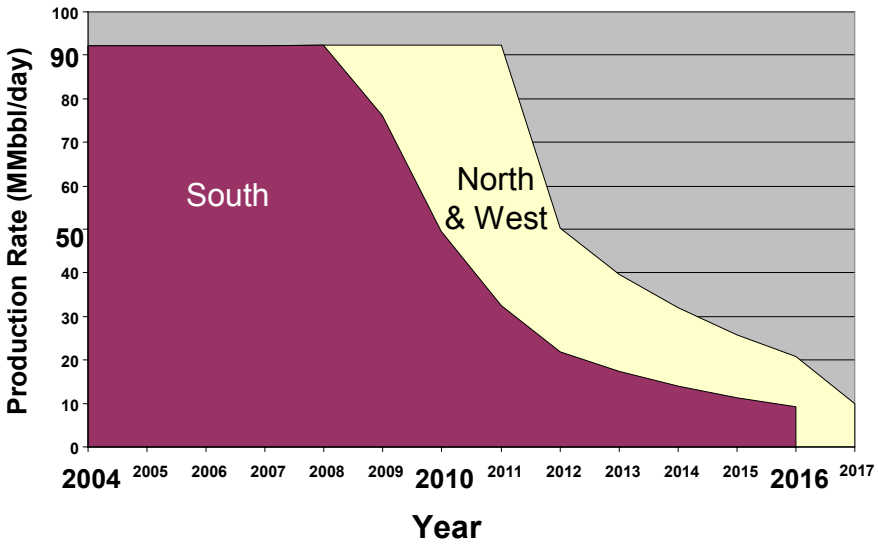

Figure 3.6
White Rose Avalon Oil Production Profiles

As can be seen from Figure 3.6, spare production capacity on the FPSO is available just prior to 2009. To avail of this, delineation drilling would have to begin in 2006 with a decision to invest in late 2007. As part of its Day 7 presentation, the Proponent provided an economic overview of a possible development scenario for the North and West Pools. It showed first oil by 2009, total additional production of 82 million barrels, an extended field life to 20 years, additional capital expenditure of $731 million, and an overall increase in the total project rate of return from 18.1% to 18.9%. This increase in the rate of return for the whole project combined with the extension of the 'full capacity' time period is considered quite significant by the Commissioner.

Obviously, it would be to the Proponent's advantage to maximize utilization of the FPSO production capacity by bringing on as much oil as possible from deferred developments where it is economic to do so. New drilling and production techniques could also increase recovery factors. As well, the results of drilling and production in the North and West Pools could favorably influence decisions to pursue development of additional potential oil in the northern and western portions of the West Avalon Pool and/or in other formations. In response to questions from the Commissioner, the Proponent stated that there are two other zones where additional oil has been encountered. One, the Eastern Shoals formation that lies below the Avalon formation, is a poor reservoir, but is estimated to contain about 10 to 15 million barrels of recoverable oil. The other is the Hibernia formation, significantly deeper and expensive to develop but containing some 13 to 45 million barrels of recoverable oil.

Based on the information presented, the Commissioner queried why the Proponent would not consider a certain amount of additional volume from deferred development in the Development Application analysis or alternatively, drill an additional delineation well or two to better understand the situation before deciding to proceed. The Commissioner concludes that in balancing its options, the Proponent believes it already has an economic

project and also believes it is quite likely some deferred development will be brought on, thus improving the economics of the base case project. The Proponent's core decision to proceed is based on the South Pool oil reserves only. This again indicates that the project is not as marginal as suggested by the Proponent. This finding has considerable implications for many aspects of project design and execution.

3.3.2 Gas Resources

The Proponent's current P50 estimate of White Rose 'original gas in place' (OGIP) is 2.5 trillion cubic feet (tcf). The Proponent, using a recovery factor of 70%, estimates recoverable gas of 1.8 tcf. The largest pool is the North Avalon Pool (.8 tcf), but there are still significant volumes in the West Pool (.4 tcf), the South Pool (.3 tcf) and in the South Mara formation (.3 tcf). These estimates are significantly less than the estimates in the original Development Plan documentation. The C-NOBP estimate released on June 26th, 2001 is 2.7 trillion cubic feet of recoverable gas. A comparison of the two is shown in Figure 3.7.

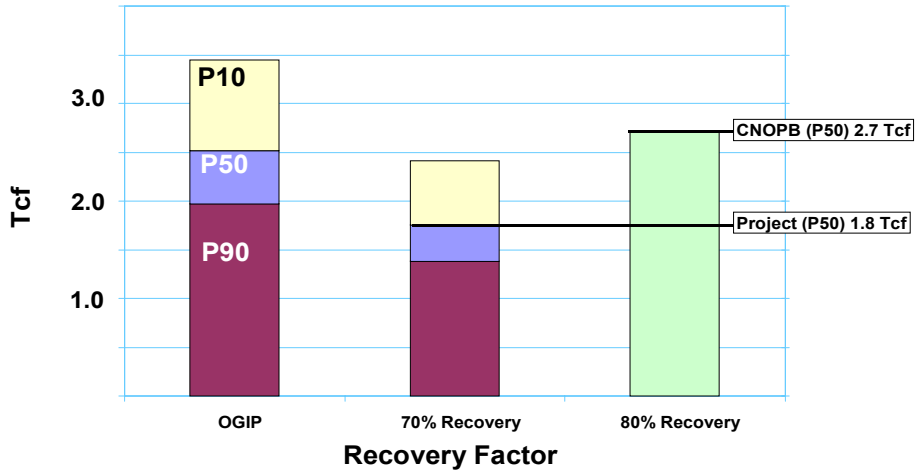

Figure 3.7
Gas Volume Comparisons

The C-NOPB has a more optimistic view of the gas in place and it uses a higher recovery factor than the Proponent. As we saw in Figure 3.5, the C-NOPB has a correspondingly lower estimate for recoverable oil. It is the Commissioner's understanding that both the Proponent and the Board have the same data and the difference is one of interpretation among professionals.

Deferred Development Plan For Gas

At this stage, only a portion of the Proponent's estimate of recoverable gas (1.8 tcf) has been delineated. The Proponent estimates that 4 to 6 delineation wells are required to prove up the existing gas resources. There are no current plans to undertake this delineation work. In fact, the Development Plan states that the depletion of the gas resource should not commence until exploitation of the oil resource is well advanced. Of

the gas produced as part of the oil production from the South Pool, about 18 million cubic feet per day (35-40%) will be used for fuel gas and the remainder will be conserved by re-injection into the North Avalon gas cap.

The Proponent's position is that White Rose is an oil play. The gas resources in the Significant Discovery Area are valuable but gas development is not part of the Development Application. Although White Rose itself cannot support a pipeline or justify gas development, it can make a significant contribution in terms of its ability to assist that process. The Proponent has said it would make its gas available should someone else build the required gas transportation infrastructure. As well, the design of the FPSO will allow some capacity to produce gas for export, but it will require modifications to the topsides to do it.

Production System Flexibility

The Proponent's presentation on system flexibility on Day 7 contributed much to the Commissioner's understanding of this overall issue. It stated that the ability to tie additional wells into the existing subsea system and flow them into existing flowlines is already built into the production design. Alternatively, another set of production wells in another glory hole can be tied in with the current turret capacity being sufficient to handle it.

Current design of the topsides provides for the production of up to 150 million cubic feet of gas per day for re-injection into the North Pool. This gas can be exported when a pipeline becomes available, provided modifications are made to the FPSO topsides to accommodate it. The Proponent, "in view of the interest and optimism it has for being able to increase the discovered gas resources in the basin" tabled a study it had commissioned to look at exporting gas production from the FPSO in the future. Three options were considered.

The first is for incremental development with gas export commencing in 2010 at the rate of 60 million cubic feet per day and rising to 150 million cubic feet per day. Modifications to the current FPSO would require the addition of about 1000 tons of equipment and steel estimated to cost in the order of $75 million. The FPSO would have to come to shore for these modifications and the total disconnect time would be about 12 weeks.

The second option is also an incremental development which contemplates a maximum gas export of 300 million cubic feet per day commencing in 2016. About 2000 tons would have to be added to the current FPSO at an estimated cost of $180 million. The total disconnect time would be about 16 weeks.

The third option is a purpose-built new FPSO facility for the North Avalon Gas field. Gas export could commence in 2008 or 2009 at the rate of 500 million cubic feet per day. Estimated costs for this option are $840 million.

In summary, it is the Proponent's position that the FPSO design has certain flexibility already built in and it can be further modified, albeit at considerable costs in terms of dollars and time, but still cheaper than the GBS option. However, according to the Proponent, the determining factor in gas development is not the cost of the production system rather it is the cost of the pipeline, the amount of reserves available and the market price that can be obtained.

3.3.3 Gas Development Generally

For some years there has been talk of the tremendous gas potential of the Jean d'Arc Basin and of other areas offshore Newfoundland. For obvious economic reasons, among others, many want the gas to be developed sooner rather than later. To this end the discovered gas resources of the White Rose Significant Discovery Area have become a focus, resulting in some of the motivation and reasoning behind various presentations during the public review that supported the GBS as the desirable production system for White Rose. Many believe that if a GBS production system were chosen, it would enhance the prospects and timeframe for full gas development, including gas transportation to market, rather than having gas re-injected into the field for conservation reasons or to maintain reservoir pressure for oil production.

People are frustrated with the 'chicken and egg' scenario they hear so often. To produce gas, the producer needs transportation infrastructure (pipeline and related facilities) to market. For the pipeline companies to construct the infrastructure, more gas is needed. To get more gas, more delineation and exploration is required. To the Commissioner's knowledge, no producer is currently conducting a delineation or exploration program specifically for gas in the Jean d'Arc Basin. How to break this cycle is a challenge needing to be addressed.

To this end, the representative of FOGO stated that the Proponent has simply not drilled sufficient delineation wells to determine White Rose gas reserves, even though it is generally accepted that White Rose is primarily a gas field, and the largest found to date on the Grand Banks. In their view, other jurisdictions would not have tolerated an application to develop a field whose true nature and extent is still unknown. Their argument is that if we knew the true nature and extent of the resources it might tip the balance in favor of the GBS as the preferred mode of development. As a minimum more needs to be known about the gas resource so as not to impair the reservoir's drive mechanism. In addressing this situation FOGO submitted a range of recommendations for the Commissioner's consideration, including deferring the current Development Application. These recommendations were all designed to meet the objective of early delineation of the gas resources.

Others questioned the logic of not undertaking a dual development now, rather than oil now and gas later. Yet another presenter recommended that a gas development strategy be given top priority, but that development of the White Rose oil reserves not be delayed by the absence of such a policy. Others recommended that Husky Oil, who has already

indicated some initiatives towards a broader scale development of gas, fast track these efforts.

As part of its presentation on deferred development, Husky Oil outlined its analysis of what is required to have a gas development on the Grand Banks. This analysis is based on the work Husky is doing with other operators and the results of three recent reports: the Duke Energy study on the feasibility of gas export from the Grand Banks; the Adams Pearson study on the overall gas resources in the basin; and, the Purvin & Gertz study on market conditions.

The Duke Energy pipeline study concluded that it is technically feasible to build a pipeline. The estimated cost is approximately $3.5 billion, and the estimated time, after sufficient reserves are available, for NEB approval and construction is in the order of 5 years. The pipeline route and other highlights are shown in Figure 3.8.

Pipeline Route

- Estimated pipeline throughput of 900 MMscf/d
- Route optimized by including 80 km buried section for risk of iceberg scour
- Operating pressure of 3,375 psig
- 900 MMscf/d gas plant at Come By Chance with 90,000 hp compression
- 1,400 km from White Rose to Country Harbour

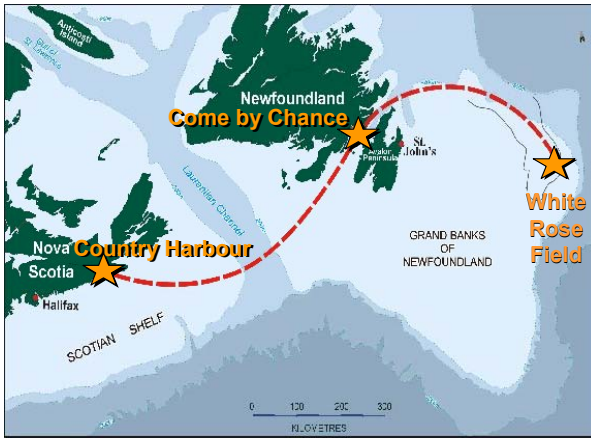

Figure 3.8
Highlights of Pipeline Study

Gas resource estimates of Grand Banks discovered gas range from 4.8 tcf to 5.7 tcf depending on whether one uses the Proponent's current White Rose estimate (1.8 tcf) or C-NOPB's June 26th estimate (2.7 tcf). As mentioned previously, the Proponent's earlier estimate of 2.5 tcf as per the original Development Plan documents, was revised to 1.8 tcf based on a reassessment. In any event, even at 1.8 tcf, White Rose is the largest single discovery to date though more delineation is required to prove it up. The proven reserves at Hibernia (1.4 tcf) are currently being used for gas flood to produce oil and it is understood this situation will continue for another period of time, at least for some portion of the produced gas. The Proponent has indicated a similar situation will apply at Terra Nova (.3 tcf).

With respect to markets, the Purvin & Gertz study conducted for the Proponent concluded that the market price for gas is expected to stay relatively stable at approximately $3.00 US for the next 20 years. The study report contemplates no Grand Banks gas development during that time, although it admits a study currently underway

may change that conclusion in the next 5 or 10 years. During questioning at the public review, the report's author admitted his views on market price were generally more conservative than others and that his overall conclusion on timing was very much influenced by the small discovered resource base here of about 5 tcf – and the fact that "they are not even proven reserves yet".

Husky Oil's analysis of a hypothetical example showed that the gas pipeline project, with a throughput of 8.2 tcf over a 25 year lifetime (full capacity), a capital cost of $3.5 billion, and a market price of $3.07 US would produce a rate of return of 15% for the pipeline operator. It would give a netback to the producer of $0.23 US. Husky Oil's conclusion is that a volume higher than 8.2 tcf and/or a higher market price is required to reach a reasonable economic threshold for the producer and that the White Rose gas and other discoveries, even combined, are significant but not a sufficient basis for a gas development system.

The material presented demonstrates that major hurdles clearly exist in the effort to bring about gas development. Nevertheless, significant benefits can result should development efforts be successful. Leadership is required and Husky Oil's current and potential role in trying to promote and/or co-ordinate activities among the operators in the basin was presented and discussed during the Day 7 session.

3.3.4 Conclusions and Recommendations

It is clear to the Commissioner that the Proponent has concluded it has an economic project in the development of the South Pool oil reserves and that there are good opportunities to access additional oil, with the attendant economic benefits. They include development of the oil resources of the North and West Pools and eventually oil in the Eastern Shoals and the Hibernia formation. Some or all of these opportunities are very likely to be realized. The proposed FPSO and related systems are designed with the flexibility to handle these additional quantities of oil and thereby increase the utilization of the FPSO and extend the overall life of the White Rose field. In time, new technology can be expected to improve recovery factors and enhance these prospects further.

There are also substantial gas resources but no current plans for their development or even to undertake further delineation. Without additional information obtained in a timely manner, the true extent of the resources and the likelihood of their exploitation by the White Rose facilities will remain unknown. Furthermore, there is a significant difference between the Proponent's estimate of the gas resources expected in the reservoir (1.8 tcf) and the Board's (2.7 tcf)**.** It is the Proponent's position that White Rose gas resources, although the largest gas discovery on the Grand Banks to date, are not sufficient to justify a gas pipeline and a gas development project, but they can certainly assist such a development.

It seems that the only way that White Rose gas can be developed is if there is a basin wide approach sufficient to justify the gas transportation infrastructure. It is the Commissioner's conclusion that the White Rose SDA is in the best position to be the

catalyst for such a development, and can really only take on that role with early additional delineation work. That delineation work can also provide the additional information necessary to determine whether the White Rose facilities can exploit those resources and to resolve the significant difference between the Proponent's interpretation of the available data and that of the Board.

In the meantime, the Proponent has made the commitment that the FPSO will be designed so that with modifications it can be used to export gas when gas transportation infrastructure is available. Should that occur, the Proponent has committed to make the gas available. In evaluating what these 'commitments' mean, it is the Commissioner's conclusion that the event is unlikely to occur without regulatory intervention at the approval stage. In a future operating situation, where the FPSO is producing oil at full capacity and everything is going well, it will not be an easy decision for the operator to break off production for a minimum of three months, with all of the resulting costs and disruptions in operations not to mention the foregone opportunities of lost or delayed production for that period, and bring the vessel to shore for a $75 million modification, the purpose of which will be to allow the export of a relatively small amount of gas at what probably will be marginal returns.

Thus, if there is to be any serious thought of White Rose gas development in the foreseeable future, the Proponent should be required to undertake early gas delineation work and to pre-invest in gas export capacity on the FPSO. As well, the leadership initiatives of the Proponent, in coordinating cooperation between the various producers in the basin with a view to an area wide approach, must continue.

Recommendation 3.3
The Commissioner recommends that the Board approve the Proponent's deferred development plan for the oil resources of the White Rose Significant Discovery Area as presented during the public sessions and outlined in this chapter, provided that the Proponent is held to commitments made at the public review that there will be sufficient flexibility in the subsea system and turret to accommodate the plan; and, provided that the White Rose oil development will not interfere with, or impede in any way, future gas development.

Recommendation 3.4
The Commissioner recommends that the Board require the Proponent to provide for the eventual production of gas for export in its design of the FPSO topsides and facilities.

Recommendation 3.5
The Commissioner recommends that the Board require the Proponent to submit for the Board's approval a specific gas delineation program for the White Rose Significant Discovery Area, commencing with at least one delineation well within 6 months of project approval.

Recommendation 3.6
The Commissioner recommends that prior to the actual start of oil production (currently estimated for 2004) the Board review the information obtained from the recommended gas delineation program, and determine whether it would be appropriate to require the Proponent to undertake, at that time, the modifications required to the FPSO to enable it to export gas.

Recommendation 3.7
The Commissioner recommends that the Board require the Proponent to make White Rose gas available for export should gas transportation infrastructure be put in place.

3.4 Project Economics

The economic issues associated with any capital investment determine the way in which the investment is planned and executed. This is particularly true for a natural resource project that involves selling a commodity into an open market. Concepts such as reserves and resources are defined not only by geological considerations, but also by economic assumptions. In the case of an offshore oil development, economic assumptions affect the concept selection, life of a field, and a multitude of other decisions related to the implementation of the project. As a result, a comprehensive review of a Development Application must also consider the economic aspects of the Application. The Board's Development Application Guidelines recognize the need for comprehensive financial and economic analysis in section 4.14:

> This section of the Development Plan should document past expenditures and provide an estimate of development and operating costs in sufficient detail to permit comprehensive financial and economic analysis. The cost data should be provided in constant dollars accompanied by a description of the methodology, assumptions and basis for the cost estimates. A summary of the annual capital and operating cost for the major components of the proposed mode of development and each alternative evaluated should be provided.

The information required by the Guidelines was provided in Volume 2 of the Development Application.

The White Rose project has been described by the Proponent as a small development with less favorable geological characteristics than Hibernia or Terra Nova. Consequently, the company has taken action to limit downside risks from capital and operating cost over-runs. Measures include:

- Pursuing an aggressive contracting schedule with many contracting milestones taking place immediately following submission of the Commissioner's report;
- Seeking lump sum, internationally competitive bids for construction of major elements of the Project;
- Accepting as valid bids some international bids with no Canada-Newfoundland content; and
- Leasing the FPSO rather than building and owning the facility, as was the case for Terra Nova.

It is true that White Rose is smaller than Hibernia and Terra Nova. Looking elsewhere however, there are many fields of comparable size and others that are smaller than White Rose. What is important is to consider White Rose on its own merits. It should also be noted that there is the potential of adding significant oil and gas resources to the project as discussed above, and thereby increasing its size.

The extent to which project economics were affecting the White Rose project design, including benefits decisions, heightened the importance of carefully evaluating the project's economic profile. It was also important to be able to make a judgment as to the Proponent's ability to carry out the commitments it was making. The Commissioner pursued this matter in his request for additional information on April 26th by requesting information on the economic analysis of the project, the Proponent's acceptable rate of return on investment, the range of returns projected for the Project and the assumptions used to arrive at the projected rates of return.

In its response the Proponent included the assumptions it used in its economic modeling along with spider diagrams showing the projected rates of return on a half cycle and full cycle basis with sensitivities for capital cost, operating cost, production rates and reserves and oil price. Half cycle basis is a go-forward analysis and is the most commonly used approach for decision-making on an individual investment proposal. The half cycle spider diagram is reproduced as Figure 3.9.

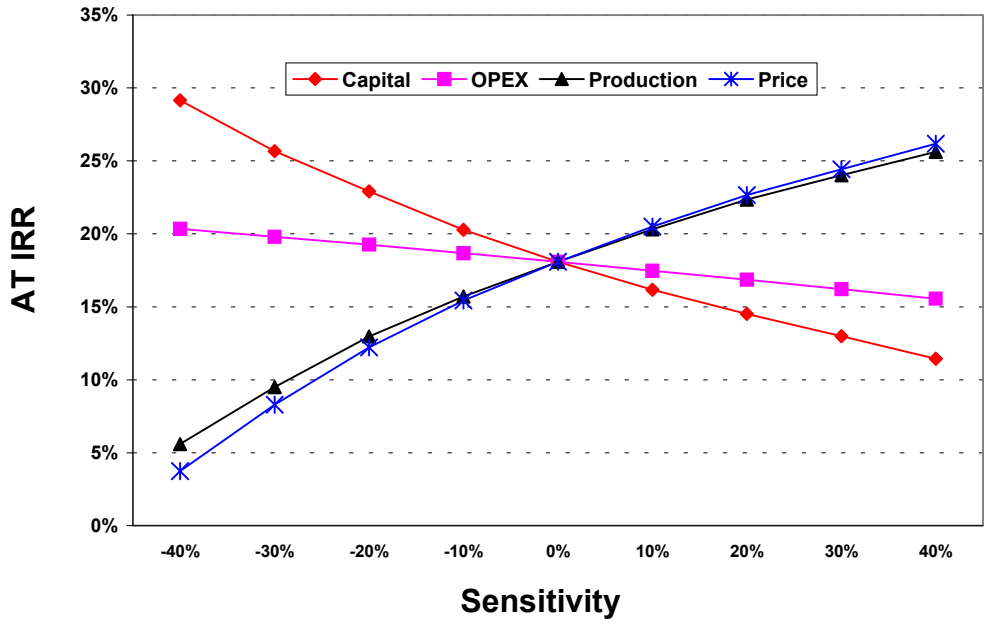

Figure 3.9
Sensitivities for the Key Economic Drives Half Cycle

The spider diagram allows the reader to examine a host of sensitivities. The after tax rate of return for the base case is 18.1%. If the price of oil were to increase by 10%, the rate

of return would increase to just above 20%. A 10% increase in capital costs would reduce the rate of return to about 17%.

The diagram also shows that the Project is most sensitive to downside risk from lower production (lower reserves) and lower oil prices. The Commissioner believes these returns represent conservative estimates. In addition to limiting the downside risk through careful control of capital and operating costs, the Proponent has addressed the downside risk by using realistic, but conservative, input assumptions for production and oil prices. The P90 reserve estimate is 20% lower than the base case. There is therefore a 90% chance that the actual reserves will be at least 80% of the base case amount. That is a considerable degree of certainty with respect to the downside risk.

The Proponent's intention to lease the FPSO also limits the risk to which the Proponent is exposed, yet the economic modeling conducted by the Proponent does not reflect the use of a leased FPSO. The rates of return provided by the Proponent are based on an upfront capital investment of almost $2.1 billion. However, during the public sessions, the Proponent confirmed that the use of a leased FPSO would significantly reduce the upfront capital cost. Without knowing the details of the lease and/or production services agreement that the Proponent and Maersk are negotiating, it is difficult to determine how the contracts would affect the Proponent's rate of return from the Project. It is, however, certain that it would limit the financial risk to which the Proponent is exposed.

During the public sessions, the Commissioner asked the Proponent to provide the projected rate of return for a number of specific scenarios. Table 3.2 below describes these scenarios and indicates the projected rates of return.

Scenario	Half Cycle Rate of Return
Case A – July 19th, 2001 exchange rate (Cdn/US = $0.65147) and crude oil price (WTI = US$25.60/bbl).	25.9%
Case B – Exchange rate Cdn/US $0.68, WTI US$22/bbl.	21.3%
Case C – As Case B with an approximately 10% more reserves (256 million barrels)	22.8%
Case D – As Case B with a 10% capital cost overrun.	19.3%
Case E – Case C with a 10% capital cost overrun.	21.0%

Table 3.2
Return on Investment – Commissioner's Scenarios

The Commissioner believes these scenarios are realistic possibilities and provide some idea of the rates of return on investment that could be achieved on the White Rose project. The Proponent also provided alternative scenarios that were symmetric opposites to the Commissioner's scenarios. The Commissioner did not consider the alternative scenarios to be realistic possible scenarios, particularly those with a 10% cost reduction.

Conclusions and Recommendations

In summary, the resulting base case rate of return indicates that White Rose is an attractive project with a rate of return of 18% rising to nearly 19% if one includes the

Proponent's estimate of potential deferred development. With less conservative but still realistic assumptions the rate of return could increase to a range of 20 – 26%. Furthermore, some of the capital invested in this Project could also be used in the development of the gas resources in the SDA that would provide an additional return on the invested capital.

The C-NOPB and/or governments can use estimates and assumptions with which they are comfortable. It is, however, critical that this analysis be undertaken. The economics of any project influence project design and require a regulator to consider economic considerations in tandem with resource management issues. It is normal for the Proponent to protect against downside risk in its forecasting, but in seeking to determine if the Proponent's plans are sufficient to satisfy the provisions of the Atlantic Accord and other relevant legislation, the Board should look at the economics of the Project on its own merits and in a realistic manner and make decisions accordingly.

The Commissioner believes that the Proponent's estimates are conservative and that economics of the White Rose project are not 'marginal'. This is a medium size project with good rate of return and considerable up-side from any one of increased production, higher market price or lower than forecast exchange rates. The economics are such that it allows flexibility, if desirable and appropriate, to pre-invest at certain levels for gas production, to undertake further delineation wells, to execute pro-active programs in the important area of benefits, particularly for research and development, education and training, and supplier development.

Recommendation 3.8
The Commissioner recommends that when considering the Proponent's legitimate responsibilities under the Atlantic Accord and the relevant legislation, particularly its responsibilities relating to Canada/Newfoundland benefits, the Board not be influenced by the Proponent's suggestions that the project is 'marginal'. The Commissioner has concluded that this is a project with a good rate of return and considerable upside potential.

Recommendation 3.9
The Commissioner recommends that a complete project economic analysis be a required part of the Board's evaluation of future Development Applications.

3.5 Contracting Strategy

For the project phase of the White Rose Oil Development, the Proponent has chosen to abandon the alliance philosophy adopted for the Terra Nova project and return to a traditional oil company – contractor relationship. The Proponent's contracting strategy for White Rose is to engage experienced contractors to execute work on the major project components on the basis of lump sum fixed price contracting.

In terms of scheduling, the Proponent chose to undertake an extensive pre-contracting initiative for the White Rose project phase coincident with the process of obtaining

regulatory approval. That initiative involved issuing expressions of interest, selecting preferred bidders and awarding front-end engineering and design (FEED) contracts. A FEED contract is used to determine the probable cost of a project component prior to the Proponent entering into a contract for that component. The Proponent has indicated it intends to award conditional contracts to the selected bidders following the release of the Commissioner's report.

The Proponent's overall contracting approach and schedule were deemed necessary by the Proponent because of its view of the economics of the project. When asked by the Commissioner on the first day of the public sessions about the problems created by this decision, the Proponent's Vice-President, Mr. Jamie Blair, explained:

> We have also known that by running and managing two processes concurrently, or at least our part of the two processes concurrently, that we are exposing ourselves to substantial risk in that the solutions that we are presenting, in fact, as we are going through public hearing and regulatory review, have a lot of capital invested in them and they may or may not meet the regulatory requirements that are in front of us. So we see the issue being more of one of we have taken a significant risk, but it is the nature of this project where we need to deal with those issues up front.
>
> …we know that we may have worked hard to foresee every issue that may arise, …but we know we won't have it all and we know we bear the risk of adjusting our schedule, changing contracts and our procurement plan to match the regulatory issues that arise.

The major components under the current proposal for a FPSO-based production system are the glory holes excavation, the sub sea equipment, the MODU, the shuttle tanker for export and the leased FPSO, which in turn is broken down into the hull, topsides, and turret and mooring system. The Proponent had selected preferred contractors for certain components prior to the commencement of the public sessions and plans to finalize selection of preferred contractors for the other components soon. The Proponent advised the Commissioner during the public sessions that fixed prices for each of the major components of the project were either already defined or would be in hand in the near future. As stated, the Proponent is obtaining bids, preferably lump sum bids, with the intention of awarding all contracts on an interim basis after the Public Review process.

Conclusions and Recommendations

The difficulties with the Proponent's contracting strategy from the perspective of the public review and the eventual approval process are obvious. In terms of optics, the current status of bidding and contract awards has created the impression that the process is a *fait accompli*, and that most of the major contracting decisions have been made before the Commissioner's report is released. In such an atmosphere, any recommendation of the Commissioner or eventual decision of the C-NOPB that requires a modification of the Proponent's contracting approach will, by definition, lead to charges of delays and additional costs on a project that is portrayed by the Proponent as 'marginal'. The contracting strategy and schedule does not allow for consideration and implementation of the Commissioner's recommendations should they be accepted by the C-NOPB.

Recommendation 3.10
The Commissioner recommends that the Board not allow the Proponent's current contracting approach and schedule to influence the Board's decision-making in any way, whether regarding the selection of a particular production system, related contracts, or regarding the provision of Canada-Newfoundland Benefits.

Recommendation 3.11
The Commissioner recommends that all risks of delay or additional costs as a result of the contracting strategy employed by the Proponent be borne by the Proponent.

4 BENEFITS AND THE CANADA-NEWFOUNDLAND BENEFITS PLAN

4.1 Introduction

The Commissioner's Terms of Reference require that the public review of the White Rose Development Application include consideration of *"the resulting benefits that are expected to accrue to the province of Newfoundland and Labrador and to Canada, having particular regard to the requirements for a Canada-Newfoundland benefits plan."*

As indicated by the representations made to the Commissioner during the public review sessions, this is a most important subject. Issues related to benefits and the Benefits Plan are central to the development of oil and gas in Newfoundland's offshore area and have been since the first discovery. Indeed, the first purpose of the Atlantic Accord is to "provide for the development of oil and gas resources offshore Newfoundland for the benefit of Canada as a whole and Newfoundland and Labrador in particular". Other purposes of the Accord are "to recognize the right of Newfoundland and Labrador to be the principal beneficiary of the oil and gas resources off its shores…" and to "…ensure that the pace and manner of development optimize the social and economic benefits to Canada as a whole and to Newfoundland and Labrador in particular." Even in the absence of the Accord's strong emphasis on benefits, it is a truism worth repeating that the fundamental reason for any jurisdiction to encourage the development of its resources is to realize the economic value of those resources.

Unfortunately, there is currently a lack of clarity and consensus regarding the Canada-Newfoundland benefits regime. There are considerable differences in expectations and a variety of opinions and interpretations regarding benefits generally and the provisions of the Atlantic Accord, specifically. This is obvious from the presentations made to the Commissioner on this subject. FOGO described the Accord as an affirmative action program for Newfoundland's offshore industry and the Newfoundland and Labrador Building and Construction Trades Council characterized the Accord as a tool to ensure economic development in the province. Alternatively, the Proponent understood the Accord as giving full and fair opportunity to Newfoundland, then Canada and then looking to international solutions. Furthermore, it was said that this approach should not penalize the Proponent financially.

There is also the issue of employment and industrial benefits versus royalty payments. This review addresses only the former, but it should be noted that it is the employment and industrial benefits during both the project and operational phases of the development, together with required expenditures on education and training and research and development, that are the basis of the sustainable oil and gas industry that so many desire.

A clear and common understanding of Canada-Newfoundland benefits requirements would be advantageous for all stakeholders. It would provide certainty for oil producers

wishing to invest, for local supply companies, for individuals seeking work, and for the community as a whole. Surprisingly, there is little guidance available and when one looks at the trends in benefit approaches that have emerged over the past 15 years, with the ups and downs experienced by the industry, it is clear that the gaps are widening.

In this chapter, the views presented at the public sessions are summarized, the relevant provisions of the Atlantic Accord and the Accord Acts are examined, the Proponent's Canada-Newfoundland Benefits Plan is evaluated and recommendations are made.

4.2 What People Said

The people of the Province have high expectations regarding the economic benefits that could and should accrue from oil and gas developments and from the commitments made by project proponents in their Benefits Plans. These benefits generally fall into the areas of employment, training and technology transfer, in the provision of goods and services, and in research and development expenditures towards developing a sustainable oil and gas industry in the Province. Presenters at the public review sessions were looking, often in vain, for continuity of employment, determined efforts at technology transfer, specific goals or targets and pro-active programs for the supply of goods and services, and certainty that the commitments of the Proponent will be adhered to. Presenters also complimented the Proponent of the White Rose Project for the location of the engineering activity to date, for its openness and stated desire to deliver Canada-Newfoundland benefits. People accept that they cannot lay all their frustrations on the shoulders of this one project or expect this Proponent to solve all their problems. Still, they feel much can be done to make things better.

In its submission to the Commissioner, the Newfoundland and Labrador Building and Construction Trades Council highlighted the fact that there had been significant employment benefits to workers from the Hibernia and Terra Nova projects. But the Council went on to state, "these benefits, pale in comparison with the lost opportunity that has been experienced, and not satisfactorily explained, in light of the objectives and principles of the Atlantic Accord." The Council lamented that even after 15 years and the statements of commitment from governments and proponents, we still have a fragmented industry. Its brief makes significant recommendations (including the preparation of a utilization plan for Bull Arm) and commits the Council to work with other stakeholders towards correcting the current situation. The Council also recommends that the Commissioner not take a position on the Proponent's Benefits Plan until it is known where the topsides are to be fabricated and assembled.

The Newfoundland Ocean Industries Association (NOIA), on behalf of its 450 member companies, pointed out that there are a number of real success stories in this province and that a considerable industry has grown up to support oil and gas development and production. Despite the successes, there is a fundamental need in the oil and gas community for sustained and continuous opportunity, and for improvements in the way procurement is done by the oil and gas industry in order to realize more local benefits and

achieve better results for both the local industry and the Proponent. NOIA supports the Proponent in its selection of the mode of development and wants development to proceed now, provided future gas development is not impeded. NOIA also recommended "specific changes be made to the current White Rose Development Plan, particularly to the Canada-Newfoundland Benefits Plan, in order to clearly identify benefit targets and to establish mechanisms for measuring benefit and tracking achievement." In a similar vein, the Newfoundland and Labrador Division of the Canadian Manufacturers and Exporters Association talked about lost opportunity and the need for a stronger commitment to benefits.

In a moving oral presentation to the Commissioner, one individual with 20 years experience in the shipbuilding and oil and gas industries who had worked on both the Hibernia and Terra Nova projects clearly articulated his experiences on those two projects and his main concern about the transfer of technology. In his view, the transfer of technology, which he equated with transferring skills in the workplace to qualified Newfoundlanders and Labradorians so that they could take on increasingly more senior and management positions, was not occurring with the frequency that it should. These comments were supported by a written submission from another individual who for the past ten years worked at Bull Arm for the Hibernia construction, at the transshipment terminal at Arnold's Cove and then at the fabrication and hook-up of the topsides modules for the Terra Nova FPSO. In her view, there is very little effort put into training and on-the-job transfer of technology and skills.

Another Participant pointed out the irony of the Proponent opposing any preference policies in the development phase of White Rose as amounting to counterproductive subsidies, while availing of massive subsidies in the exploration phase of the same project. Additionally, the same Participant called to the Commissioner's attention the fact that the benefits provisions of the federal Accord Act are specifically exempted from the operation of the North American Free Trade Agreement, as they violate the prohibition in NAFTA against performance requirements. In that Participant's view, this designation was a clear indication of the strength of the Accord provisions with respect to the provision of Canada-Newfoundland benefits.

The Women in Resource Development Committee (WRDC) put forward proposals for a gender equity plan designed to ensure equitable participation for women in the White Rose project. The brief complimented the Proponent for its approach to date, but stated "it is not good enough to rely on the good will or good intentions of an individual Proponent." The WRDC has directed its brief primarily to the C-NOPB, as regulator since it believes the C-NOPB has ultimate responsibility for ensuring women have access to an equitable share of training dollars and receive a fair share of hires based on availability in the provincial labor force. The Committee believes the Board should play a pro-active role in establishing the requirements of a proper gender equity program, provide the consultation and communication mechanism, and establish the reporting and monitoring procedures. Further, the Committee recommends that pursuant to Section 45 (4) of the Canada Newfoundland Atlantic Accord, the C-NOPB designate women as a disadvantaged group using the Federal Employment Equity Act as a model.

In Marystown, Friede Goldman Newfoundland Limited outlined its present capabilities in two facilities with a qualified workforce, signed union agreement, competitive labor rates, and management and quality control procedures to fabricate and integrate the topsides for the White Rose project. The Marystown-Burin Area Chamber of Commerce and the Schooner Regional Development Corporation documented their deep disappointment that very little work from the Hibernia and Terra Nova projects was undertaken in the area. Their assessment is that the FPSO will be the production mode chosen for White Rose, that the hull will be built in Korea, the turret constructed outside Canada, and that, therefore, their only target is the topsides. Their singular issue is to know what work can and will come to their area from that element of the project. The Marine Workers Federation, CAW, Local 20 emphasized the point that an industrial-based union agreement was in place in Marystown in line with the recommendations of the Morgan Cooper report and expressed their confidence in being able to complete quality work on time and within budget. Both Local 20 and the Chamber of Commerce/Schooner Regional Development Corporation attended several other public sessions and made follow-up presentations in support of their position on the last day. The Town of Marystown made its presentation in St. John's supporting the previous presentations from the area, again elaborating on the need for the area to win topsides work. All expressed support for the project and complimented the Proponent for its initiative in wanting it to proceed.

In Clarenville, the Discovery Regional Development Board, which represents over 110 communities with a population in excess of 30,000 people, made a comprehensive presentation on many aspects of the project. The Board supported the project and maximum utilization of the Bull Arm site but realized that common sense dictates that the topsides work be spread throughout the Province. The Arnold's Cove Area Chamber of Commerce made a series of recommendations, including a request to use Bull Arm for all topsides work together with commissioning and hookup, and for the location of all engineering and procurement functions in the Province. In accordance with the Chamber's understanding of the provisions of the Accord Acts, it strongly recommended "that there be full provision for local industry to participate, that there be transfer of technology, and that the benefits of the White Rose Project be stated specifically such that stakeholders in the Province are better able to quantify the benefits, making it easier to measure and to monitor. This would therefore bring us closer to the objectives and the ideals of the Atlantic Accord."

The Newfoundland and Labrador Branch of the Canadian Manufacturers and Exporters Association put forward a very concise brief. There are 825 companies manufacturing goods in the province or exporting products from the province and last year those firms had shipments of $2.1 billion and exports of $8.3 billion. They want the Proponent to "increase procurement of goods and services from Newfoundland-based companies, increase the broad economic benefit through natural gas development and topside development in the province; and make stronger commitment goals and targets for benefits." They are not seeking preference for procurement, but rather fair opportunity,

which in their view can only be provided through a series of pro-active procurement practices, a number of which were detailed in their presentation.

The Deputy Mayor of Arnold's Cove, in an oral presentation, stated "that the Town of Arnold's Cove and its residents support the Bull Arm site for the servicing or development of this project." They also support gas development because of the benefits it will bring to the Province. In particular, he asked the Commissioner and the Proponent to consider that benefit initiatives such as use of supermarkets and services in local communities (which may appear to be small things to the operator) do have a significant positive impact on the community and that local advisory boards have a role to play in maximizing these.

Friends of Gas Onshore (FOGO) is firmly of the view that the Atlantic Accord was intended as an affirmative action program for oil and gas development for the people of Newfoundland and Labrador and, therefore, for the development of the private sector oil and gas industry in this province. They do not believe the Proponent's Development Plan meets the objectives of the Accord in terms of the benefits to accrue, both as a result of the development mode chosen and the failure to properly provide for the development of all the resources in the field.

Members of the former Terra Nova Panel told the Commissioner of the Panel's great frustration in trying to reconcile the spirit and intent of the Atlantic Accord and the views of global competitiveness being put forward by the Proponent of that project and others. As well, based on their experience, they cautioned the Commissioner against accepting the constantly repeated assurances from a Proponent to 'trust me', and against believing that the general commitments and intentions will in fact be translated into practical programs and measures for delivering local benefits. The former Panel stated, in the strongest and most convincing language possible, that without firm and specific commitments, the general assurances and statements of commitment will mean little as project circumstances change.

The Proponent feels we should be thankful, that significant progress is being made and that, after all, this is still only the third project compared with 150 in the North Sea. The trade unions and others say we can only foresee a few more projects and if we don't get our act together soon we never will. Some point to the impact of oil and gas revenues on the provincial GDP. Others say such emphasis on the contribution to the GDP is not a very beneficial way to look at the contribution from this industry.

In summary, the public sessions provided the Commissioner an invaluable opportunity to gain a better understanding of the current views and experiences of a broad cross-section of the public on this vital topic. Presenters generally want the project to go ahead under the right conditions, and most are complimentary of Husky's initiatives to get the project going and of its efforts towards benefits in the early stages of the project. However, the public wants changes in the current situation and in the overall approach to benefits. Many feel that the benefits that have accrued as a result of the two previous projects, while important, pale in comparison to the potential, and that the spirit and intent of the

Atlantic Accord has been gradually eroding. Changes are required for White Rose, for future projects, and for the industry generally. However, people also realize that this is not a burden for the Proponent of White Rose only - but rather for all stakeholders - and look for changes in the system generally.

4.3 Atlantic Accord and Benefits

The Atlantic Accord is a Memorandum of Agreement dated February 11th, 1985 between the Government of Canada and the Government of Newfoundland and Labrador on offshore oil and gas resource management and revenue sharing in the Newfoundland offshore area.

The purposes of the Accord relevant to benefits include, among others, the following two statements:

> a) to provide for the development of oil and gas resources offshore Newfoundland for the benefit of Canada as a whole and Newfoundland and Labrador in particular;
>
> c) to recognize the right of Newfoundland and Labrador to be the principal beneficiary of the oil and gas resources off its shores, consistent with the requirement for a strong united Canada.

The Accord further states with respect to economic growth and development, "it is the objective of both governments to ensure that the offshore area is managed in a manner which will promote economic growth and development in order to optimize benefits accruing to Newfoundland in particular and to Canada as a whole."

In summary, the Atlantic Accord articulates a series of policy objectives and lays out a general framework for optimizing Canada-Newfoundland benefits, including the operational means (a Benefits Plan) by which the relevant objectives are to be achieved. The details of the content and substance of benefits arrangements are left to an independent Board, subject only to the power of a joint Ministerial directive.

By 1987, the Parliament of Canada and the Newfoundland Legislature had passed parallel and generally comparable pieces of legislation (the Accord Acts) to establish a legislative framework in accordance with the principles and framework set out in the Atlantic Accord. The Accord Acts confirm the general principles of the Accord and also confirm that the administration of offshore petroleum resources had been entrusted to a joint federal/provincial body, the Canada-Newfoundland Offshore Petroleum Board (C-NOPB). The importance of the Atlantic Accord is recognized in the preamble to both Accord Acts, in their respective titles, in the definitions sections and in Section 17(1) of each Act which clearly directs the Board to "perform the duties and functions that are conferred or imposed on the Board under the Atlantic Accord or this Act". For ease of reference, the relevant sections of the Atlantic Accord and of the Accord Acts are shown in Appendix K.

Thus, the Board has the responsibility and the primary authority to ensure that the appropriate economic benefits are delivered to Canada and to Newfoundland. In so doing, the Board must conduct itself with the Accord in mind. The legislation permits the Board almost exclusive jurisdiction to translate those principles into practice. It may even decide to dispense with the necessity of a Benefits Plan in appropriate circumstances. Where a Benefits Plan is required, as in the case of White Rose, the Board has a very broad latitude and discretion in the determination of the substance of that Benefits Plan.

Section 45 of each Act provides a definition of a Benefits Plan and goes on to make mandatory certain plan provisions which are clearly intended to ensure that economic benefits are delivered to Canada and to Newfoundland in particular. Specifically, the plan must contain provisions intended to ensure that:

a) the corporation or other body submitting the plan shall establish in the Province an office where appropriate levels of decision-making are to take place;
b) …individuals resident in the Province shall be given first consideration for training and employment…;
c) expenditures shall be made for research and development to be carried out in the Province and for education and training to be provided in the Province; and
d) first consideration shall be given to services provided from within the Province and to goods manufactured in the Province, where those services and goods are competitive in terms of fair market price, quality and delivery.

In terms of status and process, the White Rose Canada-Newfoundland Benefits Plan must be approved by the Board before the Board may approve any Development Plan or authorize any work or activity offshore. Further, in reviewing the Canada-Newfoundland Benefits Plan, the Board shall consult with both Ministers on the extent to which the plan meets the requirements set out in subsections (1), (3) and (4) of section 45 of the Act.

The obvious conclusion must be that the White Rose Benefits Plan is a very important document. Indeed, Mr. Justice Osborn, of the Supreme Court of Newfoundland, having reviewed the relevant provisions of the Accord and the Accord Acts, described the purpose of the Canada – Newfoundland Benefits Plan as follows:

> The benefits plan is designed to ensure that any development is managed so as to optimize the employment, training and experience benefits flowing to Newfoundland and to Canada.

This is a statement of intent which the Commissioner feels few would dispute, but it begs the real question of what a Benefits Plan should contain to accomplish its stated purpose?

The Accord Acts provide some guidance by requiring the Plan to contain provisions "intended to ensure" the delivery of benefits in certain areas, but the legislation ultimately leaves the approval of specific provisions to the C-NOPB. The Board's approach in the past has been to treat a Benefits Plan as a framework document, to accept statements of commitment to general principles rather than require specific and measurable objectives for benefits, and to thereafter monitor the projects to ensure compliance with those

general commitments. While this approach has led to some successes, it has failed to accomplish the ultimate purpose of a Benefits Plan, namely the maximization of the benefits accruing to the nation and the province in particular.

While unfortunate, in retrospect, this result is not surprising. By definition, the Commissioner would expect any plan to be a method of action or a procedure for the accomplishment of a particular goal or objective. All parties would accept that a benefits plan is a method of action, or a procedure, intended to achieve maximum benefits for the beneficiaries over the course of a particular development. It follows surely that provisions intended to ensure such a result would be more effective if they were clear and definite, rather than vague and general. Furthermore, if those provisions established particular goals and objectives for the development that were measurable and reasonably attainable, there would be a method of monitoring progress and measuring the effectiveness of the plan and its specific elements. As well, a Benefits Plan must contain pro-active programs designed to build on strengths and remove any obstacles to attaining the goals and objectives identified by the Plan.

In summary, the provision of industrial and employment benefits, and other benefits such as in the area of research and development expenditures in the Province, in accordance with the economic growth objectives of both governments, is an important aspect of the Atlantic Accord and its Implementation Acts. The Canada-Newfoundland Benefits Plan is the principal tool for delivery of these benefits, and an *approved* Plan is a pre-requisite or pre-condition to the approval of any Development Plan or work activity. The C-NOPB has implementation responsibility with respect to benefits and, in the Commissioner's view, it has the obligation to flesh out in considerably more detail exactly what it requires of proponents in this regard and how it will interpret and implement the benefits provisions of the Accord. Ministers also have a role to review the Benefits Plan with the Board and to issue directives if considered appropriate.

4.4 White Rose Benefits Plan

White Rose is the third offshore project, following Hibernia and Terra Nova, for which a Development Application, including a Canada-Newfoundland Benefits Plan, has been submitted.

The Canada-Newfoundland Benefits Plan put forward by the Proponent describes Husky Oil's benefits philosophy and principles; its benefits commitments; its policies and procedures for project management, supplier development, procurement and contracting, employment and training, research and development, and monitoring and reporting; its assessment of the goods and services requirements of the project and the ability of local and other Canadian companies to deliver these goods and services; and, its assessment of the labor requirements of the project and the availability of local and other Canadian workers to fulfill these requirements.

The Plan states Husky Oil's philosophy as being committed to maximizing benefits associated with the White Rose development for Newfoundland and Labrador, where practically and commercially achievable, and as being supportive of policies and practices that support industry and labor in the region. This philosophy is based on the stated belief that sufficient capabilities and resources exist within the Province and Canada to perform the majority of the work required for the development, and that Newfoundland and Labrador has the right to be one of the principal beneficiaries of the oil and gas resources off its shores. Guiding principles include: full and fair opportunity; first consideration to Newfoundland and to Canada; a pro-active approach to achieving best value for the project; and, "value adding" is imperative. The Plan states that measures will be taken by the Proponent to ensure that these beliefs and guiding principles evolve into corporate culture and are adopted as policy by all contractors, subcontractors, manufacturers, suppliers and vendors in the supply chain.

Section 3.1 of the Plan outlines the Proponent's principal Canada-Newfoundland benefits commitments that are consistent with management systems and procedures for the White Rose project. These may be summarized as follows:

- The development will be managed from St. John's;
- Goods and services must be acquired on a 'best value' basis;
- Canada-Newfoundland benefits will be a factor in procurement. Where bids are "essentially equal on a best value basis", first choice will be given to goods and services provided from Newfoundland and Labrador;
- Husky Oil will provide early identification of opportunities and will provide timely information and encouragement regarding supplier development;
- Newfoundland and Labrador and Canadian infrastructure use will be encouraged.

  > Qualified offshore fabrication and construction yards in Newfoundland and Canada will be provided a full and fair opportunity to bid, such that:
  >
  > - The Company will undertake to cause, when competitive under international bidding on a best value basis, the fabrication, assembly and outfitting services associated with the topsides facilities of the FPF, the subsea facilities, the mooring system and the production risers to be performed in Canada.
  > - Where Newfoundland fabrication/assembly/outfitting facilities exist and are qualified to be capable of undertaking development activity, the Company will require contractors to bid the work using a Newfoundland location in addition to bidding other locations of normal preference.

- The Company will require project management and system engineering work for the FPF and associated systems, subsea equipment, well construction and production operations, to take place in Newfoundland;
- Individuals resident in the Province will be given first consideration for training and employment opportunities with the development;
- Contractors and subcontractors will adhere to the benefits philosophy; and,

- Technology transfer and research and development are important components of the Canada-Newfoundland Benefits Plan.

More detail on the management systems and procedures to be used in carrying out these commitments is found in the Benefits Plan document itself. The Proponent's procurement requirements are described in Chapter 5 of the Benefits Plan and, together with its assessment of potential supply sources, are summarized in Tables 5.12-1 and 5.12-2. Similarly, labor requirements, totaling approximately 12.2 million person-hours over the life of the project are outlined in Chapter 6, with the overall summary provided in Table 6.10-1.

4.4.1 Plan Evaluation

White Rose is the first development to be proposed under the Province's generic royalty regime and with the only benefits provisions being those put forward by the Proponent of its own volition in its Canada-Newfoundland Benefits Plan. There is no negotiated agreement between the Proponent and Government. The Proponent has consistently portrayed the project as marginal, having just one-half the reserves of Terra Nova and about one-quarter those of Hibernia, and much less able to withstand cost overruns like those experienced by the Terra Nova project. The Proponent's contracting strategy is to require fixed price contracts for major elements of the project to control costs. Its Benefits Plan requires all procurement of goods and services to be done on the basis of "best value internationally competitive" bidding, a standard that it states is consistent with the provisions of the Atlantic Accord and the Accord Acts. The Proponent advises that the proper way to look at benefits is on a full life cycle basis with the greatest opportunities being in the operations phase as opposed to the project phase. The Proponent has committed to do most of the engineering locally and is proceeding to call for and evaluate proposals *at its own risk*, subject to project approval. The White Rose Canada-Newfoundland Benefits Plan is a very general document with no accompanying negotiated agreement to require specific benefits obligations.

Where the language of the White Rose Benefits Plan is definitive rather than general the statements contained are often potentially misleading or simply incorrect. For example, the Plan suggests that all procurement decisions must be made on the basis of economic and technical considerations, with benefits relegated to a subsidiary role. The obvious implication of this proposition is that economic and technical considerations would necessarily be sacrificed if benefits were also a primary consideration. There was no information presented to support that assumption, and in any event it runs counter to the Commissioner's view that the delivery of benefits should be a consideration in every procurement decision from the outset. The Plan also states that the evaluation of bids on a best value basis, which is a broad-based subjective approach to the acquisition of goods and services directed at producing the greatest advantage to the purchaser, is consistent with the requirements of the Atlantic Accord and the Accord Acts. The Commissioner strongly disagrees with this statement particularly when the best value evaluation does not include benefits considerations.

The Plan also suggests that to focus on short-term benefits, i.e. those at the project or construction stage, is improper and may in fact be detrimental to local industry. Comments have been made about "buying short term construction jobs" at the expense of other, more substantial, benefits. The proper approach according to the Proponent is to consider the benefits over the full life cycle of the development, and not to be concerned if substantial local benefits are not captured during the project phase, as the majority of benefits will be realized during the operations phase.

This contention does not sit well with those who have invested in the necessary infrastructure, those who have acquired the required skills in the skilled trades, nor with those who have invested in the local industry, and it should not. In the Commissioner's view, it should not because it deprives the Accord and the Accord Acts of their true importance in the area of maximizing benefits. It minimizes the potential economic benefits of the construction phase, as well as the contribution that the skills and experience acquired during that phase makes to the creation of a sustainable oil industry. There is no legal or practical reason why the goal should not be to concentrate on both phases of the development and to do both properly.

In short, the White Rose Canada-Newfoundland Benefits Plan is, for the most part, a very general document with a collection of principles, beliefs and statements of commitment. On first reading, one might be tempted to take comfort from the pleasing and flowery language of the Plan and be lulled into a feeling of confidence that all will be well. On closer inspection, however, the Plan gives no firm assurance that its implementation will result in any significant level of benefits being delivered to Canada and to Newfoundland. There are no firm or quantifiable goals or objectives for employment or for goods and services for the Proponent to strive towards and against which its performance is to be measured. There are no meaningful lists of specific pro-active measures the Proponent is undertaking to ensure that the objectives will be met. There are no specific quantifiable commitments or expenditure estimates in the important education and training and research and development provisions.

Finally, the goods and services provisions are significantly qualified by clauses such as 'best value', 'internationally competitive', 'essentially equal', etc. There is no inclusion of local content or benefits considerations in the actual evaluation criteria for the selection of successful bidders. It is true that if the local or Canadian bidder has the best bid he/she will get the contract. In other words, local bidders will not be discriminated against. None of these conclusions were even disputed by the Proponent.

Following the focus session on benefits and upon review of what had been said in various presentations and discussions, the Commissioner sought, at the last general session, to ensure that he clearly understood the Proponent's interpretation of the provisions of its Benefits Plan with respect to the procurement of goods and services. The Proponent, when asked, confirmed that the following statements were accurate:

- Contracts for goods and services are to be awarded on a 'best value internationally competitive' basis;

- Husky believes this is consistent with the provisions of the Atlantic Accord and The Accord Acts;
- Best value as defined in the Plan is a blend of various criteria but Canada-Newfoundland Benefits or local content is not one of those criteria;
- The best value evaluation is a subjective evaluation by the Company with different weightings assigned to the different criteria by the Company. These weightings may change from contract to contract and are confidential;
- Where bids are "essentially equal" on a best value basis, first choice will be given to goods and services provided from Newfoundland and Labrador;
- In the Commissioner's hypothetical widgets example, local company A, although having the best bid of 6 other local and Canadian companies, all with the capability to do the work, may still lose the contract to a foreign bid. The contract could be lost for any one of a number of reasons, including cost. There is nothing in the Benefits Plan to prevent this; and
- The SBM bid for topsides fabrication (with no Newfoundland content) meets the requirements of the present Benefits Plan.

Competition

In the Benefits Plan the Proponent commits to "bringing maximum benefits associated with development of White Rose to Newfoundland where practically and commercially achievable on a competitive basis." Similarly, the Proponent "believes that substantial work associated with the engineering, procurement, construction and operations can be performed in Canada and in particular, in Newfoundland, on the basis that the work is competitive."

The Commissioner supports the principle of competition. However, the Proponent has taken such an extreme view of its meaning that the Accord provisions have been rendered meaningless. If competitive means the lowest price or even the best bid, regardless of the margin of difference, the Proponent's commitments amount to nothing more than a commitment to conduct business according to standard free-market principles. Competitive in terms of fair market price does not necessarily mean the lowest possible price resulting from an international bidding process. It should mean a reasonably comparable price, a price in the same range as other participants in the market will usually and generally charge.

The interpretation that 'competitive' means the absolute best combination of low price, quality and delivery with no reference to benefits renders Section 45 (3) (d) of the Accord Acts redundant. The result of such an interpretation is that if a local company has the best bid, it will not be discriminated against. Such a narrow interpretation is not consistent with the objectives of the Accord and permits absurdities to be seriously discussed.

Furthermore, such a simplistic perspective on international competition denies the reality of subsidies and other non-competitive practices of such internationally competitive industries as Korean shipbuilding. At the public sessions, one of the participants, who

was also a member of the recent federal task force on shipbuilding, pointed out that in comparisons of quality and productivity, Canadian yards can compete successfully on the international stage; however, they cannot and should not be expected to compete with heavily subsidized industries in other countries. Another Participant made this same point when he reminded the session that the World Bank and IMF had to bail out the Korean economy, while fair competition requires a level playing field.

The Accord speaks of competition in terms of individual contracts for the supply of goods and services and the Commissioner believes it is reasonable, if the regulator is satisfied that the Newfoundland or Canadian market has sufficient capability on a competitive basis, to require the Proponent to hold the competition among suppliers within that market.

Best Value

The Proponent states that goods and services must be acquired on a best value basis.

The term best value does not appear in either the Accord or the Accord Acts. Rather it is a term, along with "internationally competitive", that has been promoted by the industry, and accepted in some circles as the norm for this industry as if anything different would be somewhat less, undeserving and paternalistic. Both terms are increasingly being used in a way that denies the spirit and intent of the Accord.

Best value is a general and subjective cocktail of criteria that allows the Proponent or contractor the discretion to make the bid selection decision, which, *in its view*, gives it the best value or best meets its interests. By varying the weighting assigned to the various criteria it allows the Company to choose whichever contractor it wishes. Most significant is the fact the 'local content' is not one of the criteria considered in this cocktail. As a result, bidders with high local content who are generally competitive but who may not have the best value bid can be dropped from consideration before benefits issues are even considered. This approach in itself is extremely problematic and contrary to the spirit and intent of Section 45 (3) (d). Indeed, the Proponent at one point during the public sessions described an evaluation process involving a commercial, technical and benefits review at the first stage. This is not the evaluation process described in the Proponent's Benefits Plan. Furthermore, when asked to clarify the matter, the Proponent confirmed that best value did not include benefits.

Nevertheless, the Commissioner believes that a best value approach to bid evaluation, provided local content is formally included as a specific criteria, combined with a system of 'quantifiable objectives' and a proper monitoring and reporting process, is workable for both the Proponent and the regulator, and would be in the spirit of the Accord and Accord Acts.

International Competition

International competition is referenced several times in the White Rose Benefits Plan and was continuously stressed by the Proponent during the public sessions. As noted above,

despite the fact that *international* competition is not referenced in the Accord it has in recent years become widely accepted in the oil and gas industry in their approach to Newfoundland Benefits. This was not always the case. The Benefits Plan for Hibernia put forward the notion of international competitiveness as a goal to be attained i.e. "to encourage the development of internationally competitive Canadian sources of supply, wherever possible." In the Terra Nova Benefits Plan, internationally competitive bidding was put forward, not as a goal, but as a requirement for participation, or alternatively as a rationale for the exclusion of local participation, in order to maintain the 'commercial viability' of the project. Or so it was stated.

The Commissioner believes international competitiveness is certainly among acceptable goals to strive for, and in time with a larger number of projects under our belt, a greater number of local and Canadian firms will successfully compete internationally. But this can only happen if they build up their expertise and experience through significant participation in our early projects. If there is no work, or if we do not supply goods and services, our competitiveness will not improve. The Proponent believes that many Newfoundland and Canadian firms can complete internationally now. The Commissioner agrees. However, this is not a rationale to require that all firms be internationally competitive without regard for other factors including the strategic importance of the contract to the development of the sustainable industry in Newfoundland, the size of the contract and the related benefits issues.

It is well known and accepted that in an overall sense, capital is allocated to projects all over the world based on an international comparison of project economics. It does not follow, however, that for a project to be competitive with international projects in the Proponent's portfolio that each and every contract must be the best value bid on an international basis. The Proponent has accepted this in practice. The Commissioner was told that after determining that a group of local environmental consultants were capable of managing the Environmental Assessment and Development Application, the Proponent limited its call for bids to those firms. This approach should be reflected in the Benefits Plan and used frequently.

This is not a protectionist decree against international firms. Rather, we need international firms to work with us and they can generate significant levels of local benefits in the process. What is unacceptable is international competition in isolation from the objects of the Accord with respect to benefits.

Targets or Quantifiable Objectives

The approach to using specific goals or targets is quite common in most endeavors and is finding valuable use in other 'benefit agreement' situations including Impact Benefit Agreements with Aboriginal people. Specific recommendations were made to the Commissioner in this regard. NOIA complimented Husky for its efforts to date and put forward a detailed proposal calling for specific goals and strategies for procurement, supplier development, technology transfer, and research and development. In its view, specified benefits targets enhance the overall approach. Without goals there can be no significant achievement, or to quote from the NOIA presentation, "there is a common-

sense maxim on benefits, confirmed by the experience of other jurisdictions, which tells us that to achieve anything, we must know what it is we are trying to achieve". The Newfoundland and Labrador Division of Canadian Manufacturers and Exporters Association also recommend "stronger commitment goals and targets for benefits." The Federation of Labor in its presentation recommended that there should be job creation and skill transfer targets and transparent monitoring mechanisms. The Women in Resource Policy Committee characterized the experience of women on the two previous projects as "disappointing" and called for quantifiable training and employment objectives for women to be included in the White Rose Benefits Plan.

Both the Proponent and, the Canadian Association of Petroleum Producers (CAPP), argued strenuously against specified goals or targets because they believe such a system implies preference. The Proponent further believes that prescriptive targets suggest that local business cannot be competitive, are counter to building a local competitive industry and may result in artificially high prices. The Commissioner would understand the Proponent's concern if the targets were to be imposed in an arbitrary manner by the regulator. Since this is not the intent nor has it ever been suggested, it is difficult to see merit in these arguments. The targets are not quotas, as some observers immediately categorize them (perhaps for their own purposes) but rather management tools to help all parties improve performance in keeping with the intent of the Accord. The Proponent has accepted the utility of targets in the area of safety. In the case of benefits, their purpose is to increase Canada-Newfoundland benefits without compromising the basic interests of the Proponent.

The Proponent should come up with its best specific estimates of what it thinks it can achieve in terms of Canada-Newfoundland benefits 'taking everything into account', including industry capabilities and labor availability, the Proponent's own pro-active programs, and its discussions with industry, labor, and the regulator. The regulator, C-NOPB, as part of the Benefits Plan evaluation, would consider these targets and if approved they would be used for monitoring purposes and to measure performance. Targets can be adjusted up or down by the Proponent in consultation with the C-NOPB. For example, over the life of a project, target levels of employment might increase as capabilities of local labor and business increase. Conversely, when unforeseen barriers are identified, targets might be lowered or measures put in place to address these barriers. All participants would know the rules of the game as opposed to trying to second guess a very generally worded and over qualified Benefits Plan.

Finally, a very important feature of such a system is that the Proponent would retain flexibility and discretion on individual decisions (including contracts) but would be responsible for achieving the overall aggregate quantifiable objective in that particular area. It is on this basis that performance will be monitored and reported by the C-NOPB.

Specific Measures

Education and training, technology transfer and research and development are all essential to building a sustainable oil and gas industry. It is not surprising therefore that the Accord Acts require a Benefits Plans to contain provisions "intended to ensure

that…(c) expenditures shall be made for research and development to be carried out in the Province and for education and training to be provided in the Province…" . The Board's Development Application Guidelines state that research and development is "fundamental to increasing the level of Canadian participation in future domestic offshore developments". The Commissioner concurs.

In the area of training, education, technology transfer and employment the Proponent's Benefits Plan makes reference to some specific measures that have been taken in the past (and these are important), but there are no specifics of what is envisaged to be accomplished over the next 3 years of project execution and the following 12 or more years of operation. In particular, there is no list of specific pro-active programs the Proponent intends to undertake to overcome shortfalls in local capability and expertise, for example in the area of divers and senior operational managers.

Research and development is addressed in the Benefits Plan in a similar way. Initiatives to date, including expenditure amounts, are summarized in the Plan. A mechanism for the establishment of a multi-year research priority list and budget is described along with research topics for consideration. While this information is helpful, such a significant issue demands further detail. In the June 8th additional information response to the Commissioner, the Company put forward a good outline of the research and development needs and indicated its willingness to participate with other stakeholders. However, the Proponent is required to put forward specific expenditure commitments and these should be included in the Benefits Plan.

Specific commitments in terms of 'education and training' and 'research and development' should be made in line with the overall objective of maximizing benefits and in the broader context of creating the proper longer term economic environment and business community appropriate to a major oil and gas producer. Such expenditures are contemplated in the Accord and are not to be narrowly interpreted as having to be directly related to the specific project for which the Development Application is being filed.

Spirit and Intent

Identifying the appropriate content of a particular benefits plan and thereafter monitoring its effectiveness will invariably raise questions of interpretation. In the Commissioner's view, the very object of the legislation establishing the regulatory scheme is to give effect to the Atlantic Accord, and in fact the Board must conduct itself with the Accord in mind. The Commissioner also believes that the purpose of the benefits provisions of the Accord Acts is not seriously disputed by either the beneficiaries, the proponents or the regulators, and as previously pointed out has been the subject of judicial pronouncement. Simply put, those provisions are designed to maximize the employment, training and experience benefits flowing to Newfoundland and Canada. Clearly the Board should employ a purposive approach to its approval of benefits plan provisions and the execution of its monitoring activities, and should adopt the interpretation that is most likely to ensure that the *spirit and intent* of the legislation and the Accord is reflected in the outcome.

Contracts - Project Phase

The contracting strategy currently being pursued by the Proponent is discussed in section 3.5 of Chapter 3. It requires contractors to provide lump-sum prices for the major elements. The Proponent has stated that equipment contracts are to be tentatively awarded after the public review process is completed with final contract awards after project sanction. The major components are the glory holes excavation, the subsea equipment, the MODU, the shuttle tanker for export and the leased FPSO, which in turn is broken down into the hull, topsides, and turret and mooring system.

The FPSO will probably be leased from Maersk under a production services agreement. The hull is to be constructed at the Samsung yard in Korea. A FEED study for glory hole excavation was awarded to a Dutch firm, Boskalis, to engineer a deep water dredging system.

Proposals for the turret & mooring system and for installation are currently being evaluated. The Proponent informed the Commissioner during the public sessions that all bidders had committed to doing engineering locally. The Proponent also stated during the July 30th public session that all these bids propose fabricating " the main elements of the turret" outside the province. According to a NOIA bulletin dated July 19th, 2000, one of the bidders, APL, plans to fabricate the STP buoy for the turret at NewDock in St. John's. If the Proponent is correct that FPSOs are the trend for the future, the fabrication of elements of turret systems is a key step for the development of a sustainable international offshore industry. This is an example of where a benefits consideration within the best value determination is critical.

Topsides are being re-bid. The company has a fixed price bid for topsides which is being held open till August from SBM (see below). In the meantime the Proponent, through Maersk, has subcontracted with AMKC to try to find what they term as "a Canada/Newfoundland solution" close to their targeted price per ton of steel. The Proponent's optimism that this can be achieved ranges from "very optimistic" to "cautiously optimistic".

By far, this topic of the fabrication and integration of the topsides has been the most frequently discussed of any, both by the Proponent and Participants in the whole public review process. Comments from Participants are probably best summarized by the Newfoundland and Labrador Branch of the Canadian Manufacturers and Exporters Association.

> It's critical to the province. The capability exists here and the quality has been proven. It does technology transfer. It provides employment and procurement opportunities. If the topsides development is here, procurement opportunities will be here. The last thing is credibility enhancement. If we can't do the work in our own backyard, we will not have credibility to do the work in anybody else's backyard.

The Proponent is into its third round of bidding in an effort to get a fixed price contract for the topsides based on fabrication in Newfoundland and Canada. Originally the

Company, through its FEED contractor, had asked four bidders for a fixed price bid, and in accordance with the Benefits Plan commitment had required the contractors "to bid using a Newfoundland location in addition to bidding other locations of normal preference". Two of the bidders were not prepared to return a fixed price and the other two returned fixed prices but proposed bids with no Newfoundland content.

One of these two was Single Buoy Mooring (SBM), a large Dutch multi-national bidding out of Houston. Husky asked that this bid be held until August and in the meantime contracted AMKC to try to find a solution based on the use of local fabricating capabilities. This process is ongoing with the SBM bid being held in the background as a carrot or a stick, depending on one's perspective.

To give the Proponent credit, it has designed the topsides so that it is made up of twice as many modules as in the case of the Terra Nova FPSO, and therefore of a size more suitable for fabrication at local yards. Nevertheless, it is very difficult to see the logic that allowed the SBM bid to be considered acceptable and to be held up as a price standard, to be met locally.

The Commissioner has still not been able to reconcile this process/practice with the Proponent's statements of commitment in its Benefits Plan. How is the SBM bid even considered to be still valid? Why does the Proponent consider the AMKC approach so *unusual* and pro local benefits? It is a significant and pro-active effort but why wouldn't we expect effort along the same lines with respect to getting a modest part of the turret work here, or to ensure that Canadian and Newfoundland suppliers actually supply some of the materials and equipment for the Samsung hull, etc.*?*

It is inconceivable to the Commissioner and, it is submitted, to all who made representation at the public sessions, and to most Newfoundlanders, that a bid to construct, fabricate and assemble the total topsides package offshore, with no local content, could meet the requirements of a Canada-Newfoundland Benefits Plan, and consequently that the completed FPSO could simply arrive at the White Rose site on the Grand Banks. Such an outcome makes a mockery of the Accord and the Accord Acts, yet this could happen and still meet the requirements of the Proponent's Canada-Newfoundland Benefits Plan, despite its commitments to encourage the use of local infrastructure, and other generally worded commitments of a like nature in the Plan.

4.4.2 Benefits Resulting From Proponent's Plan

At the beginning of this chapter, reference was made to an excerpt from the Commissioner's Terms of Reference of the specific requirement to consider ... "the resulting benefits that are expected to accrue to the province of Newfoundland and to Canada …". It is the Commissioner's view that given the general nature of the Proponent's Canada-Newfoundland Benefits Plan, it is impossible to anticipate or to predict the outcome even if the Plan were implemented successfully. And how would one know if that occurred? The Plan itself gives no estimates or predictions of what

results or benefits will occur. Concern in this regard was expressed in a number of the public sessions.

In an attempt to resolve this dilemma, considerable effort has been made by the Commissioner to obtain estimates of benefits likely to accrue, both at the 'additional information' stage of the public review and at the 'merits review' or public hearing stage. In his request for additional information dated April 26th, the Commissioner made the following request to the Proponent:

> 12. Provide, in tabular form, specific estimates in quantifiable terms of the Canada and Newfoundland content that the Proponent expects will result from its implementation of the proposed Canada–Newfoundland Benefits Plan. Separate the Project period from the Production period, goods and services from labor, and provide the breakdown by various project elements to a similar level of detail as shown in the Development Application for project requirements. Also, please indicate which items are captured locally by geography, as compared to those enticed, attracted or won by the Proponent's pro-active measures.

Employment, Education and Training, Technology Transfer

In its response dated June 8th the Proponent stated that it was not prepared to provide estimates for the majority of the request, but did provide estimates for 'engineering and management' and for 'direct labor'. Table 4.1 shows the Engineering and Management estimates provided.

Project Component	Engineering & Management			Total Person Hours
	NF	Canada	Non Cdn	
Husky Oil Proj. Eng. & Mgt.	300,000			300,000
FPSO FEED and Design	875,000	305,000	350,000	1,530,000
Subsea FEED and Design	85,000	5,000	120,000	210,000
Drilling Engineering	130,000		5,000	135,000
TOTAL	**1,390,000**	**310,000**	**475,000**	**2,175,000**

Table 4.1
Engineering and Management Person – Hours Estimates – Major Contracts
(2001 to Third Quarter 2004)

These numbers were further refined by the Proponent who informed the Commissioner during the public sessions that it now estimates that "over 75% of the engineering associated with the project can be done here in Newfoundland".

As well, during the period of the public sessions the Proponent corrected major errors in its estimates of direct labor and provided additional information on indirect and induced

employment. The revised estimates for direct employment in both the Project Execution Phase and the Operations Phase are shown in the following two tables:

Project Component	Total Employment	NF Employment
Husky Project Mgmt	600,000	500,000
FPSO Topsides	3,500,000	2,850,000
FPSO Hull	1,200,000	25,000
FPSO Turret	700,000	50,000
Subsea	1,200,000	500,000
Drilling	1,200,000	600,000
Logistics	700,000	600,000
Total	9,100,000	5,125,000

Table 4.2
Estimated Direct Employment – Project Execution Phase
(2001 to End of 3rd Quarter 2004) (Person Hours)

Project Component	Total Content	NF Content
Husky Project Mgmt	1,400,000	1,300,000
FPSO Operations	3,400,000	3,100,000
Drilling	400,000	200,000
Logistics	2,400,000	2,100,000
Well Interventions	900,000	500,000
Abandonment	200,000	100,000
Tankers	1,500,000	1,300,000
Total	10,200,000	8,600,000

Table 4.3
Estimated Direct Employment – Operations Phase
(4th Quarter 2004 to 2016) (Person Hours)

It should be noted that the Newfoundland content during the Project Execution Phase of approximately 56%, as shown in Table 4.2, assumes that the topsides will be constructed, fabricated and assembled locally. If that is not the case, the Newfoundland direct labor content during this Phase falls dramatically to the very low number of just 25%. As can be seen from Table 4.3 above, the Proponent estimates that approximately 84% of the person-hours during the Operations Phase will be provided from Newfoundland. It is not clear what programs the Proponent has in mind to ensure that the number is as high as possible at the start and increases gradually over time.

Also in the June 8th response, the Proponent provided a table showing the estimated number of expatriates required for each project element during the construction stage. This table is reproduced below.

Element	Estimated Number of Expatriates	Total Positions
Husky Oil Project Management/Technical	15	45
Topsides		
Management and Administration	25	140
Engineers and Technicians	30	215
Skilled Trades	25	1,245
Turret		
Management	2	2
Engineers and Technicians	3	3
Installation		
Management	2	2
Engineers and Technicians	3	3
Maersk Project Management	40	60
Subsea		
Management and Administration	10	25
Engineers and Technicians	20	30
Skilled Trades	50	300
TOTAL	225	2,070

Table 4.4
Estimated Number of Expatriates Required for Each Project Element

For operations, the response stated "positions will be primarily filled by personnel recruited in Newfoundland, although they will be supported, where necessary, by personnel from within the Maersk organization so as to ensure the required level of competence". Specific numbers by job category were not given.

Procurement of Goods and Services, Materials and Equipment

The Proponent is required to state its requirements for materials and equipment and contracted services and to provide an assessment of Newfoundland and Canadian capacity and capability to meet these requirements. This it has done and results are shown in Tables 5.12-1 and 5.12-2 in the Benefits Plan. However, leaving this issue with only the comment that "competitive bidding and market demand will be important factors

affecting the source of supply" highlights the glaring inadequacy of the Plan. While the statement is on its face true, it completely ignores the onus on the Proponent to provide some reasonable estimates of the amount of materials and equipment for the development that reasonably can be supplied from Canada and from Newfoundland. The Proponent has not been prepared to provide such estimates, arguing it is unwilling to "second guess" the results of various Requests for Proposals and that until contracting decisions are finalized, it is premature to speculate on which specific approach to benefits might be successful. The Proponent further argues that establishing benefits targets at this early stage will potentially restrict the pool of bidders resulting in a negative impact on project costs. To accept these arguments would be to agree to wait until all major contracts have been decided and the contractor and subcontractor supply chains fixed before benefits estimates, which are important in judging the plan itself, can be given. By that time it is too late. The Commissioner is not prepared to accept the Proponent's position on this matter. There is no legal or practical reason why the Proponent cannot provide estimates in this area as it does with respect to reserves, economic assumptions, and many other aspects of the project. This matter remains a major difference in approach between the Proponent and the Commissioner.

The Commissioner requested supply estimates because this information is essential to understanding and evaluating "the resulting benefits that are expected to accrue" given local capabilities and given pro-active programs by the Proponent, its contractors and subcontractors, to positively influence the outcome. In addition, it is the Commissioner's view that such information and a pro-active implementation approach will, in fact, contribute to maximizing local benefits without compromising the Proponent's ability to obtain goods and services on a commercially competitive basis. NOIA, for the reasons outlined in its brief, requested similar information and recommended that the Proponent's Benefit Plan be updated to reflect it. According to that presentation, the resident industry was severely restricted with respect to the Terra Nova project, which, for the most part, was engineered and procured outside the region with each alliance partner relying chiefly on its approved manufacturer and supplier lists (or frame agreements). Further, NOIA states that "the accelerated timeline of the White Rose project will tend toward the same approach, unless Husky's Canada-Newfoundland Benefits philosophy, strengthened and made specific and measurable by defined targets and weightings, is enforced not only upon White Rose major contractors, but also upon companies now preparing bids for White Rose major contracts." The Commissioner agrees.

The importance of maximizing benefits in this area cannot be overstated. As part of the initial evaluation of the Benefits Plan the Commissioner had an independent consultant examine this issue. That report indicates, first of all, that the dollar expenditure on materials and equipment is expected to be in the order of three times the expenditure for labor for the project phase and approximately twice the expenditure for labor during the operations phase. The report concludes that it would be reasonable to expect that in the order of 25% of total material and equipment during the project phase and in excess of 60% during the operations phase can reasonably be sourced in Canada/Newfoundland. Furthermore, while obvious, it needs to be said that to the extent that major elements, such as the topsides, can be fabricated, hooked up, and commissioned locally, it enhances

the competitiveness of Canadian materials and equipment and increases the chances of them being used with the resulting benefits to Canadian and Newfoundland suppliers. This then, is a huge area of potential benefits, over and above direct labor considerations, and has to be a major part of the benefits considerations of the Proponent and all other stakeholders in striving to achieve the Province's economic development objectives as referenced in the Atlantic Accord.

Of particular relevance to this issue is a document (MR-006) tabled by the Proponent at the public review sessions and entitled 'An Analysis of the Economic Impact of the White Rose Project on the Newfoundland and Canadian Economies'. An independent consultant, Dr. Wade Locke, prepared the analysis for Husky Oil. Basic to the analysis was the fact that "Newfoundland and Canadian supply content on materials and equipment was estimated using a range of capture rates. These rates depended on the type of goods and services required and the ability of the Newfoundland and Canadian business community to supply that particular type of good or service to the project." The supply rates chosen are shown in Table 6 of that document and "refer to the amount of goods and services that would be supplied by Newfoundland and Canadian firms". These numbers contribute to the calculations of indirect and induced employment and eventually the impact on the Canadian and Newfoundland economies. The report also provides an 'Enhanced Supplier Development Analysis'. To quote:

> …a major factor which determines the level of spin-off impacts (indirect and induced) on the economy is the amount of non-labor project expenditures captured by an economy. This 'capture rate' determines how much is spent in the local economy, and in turn how much employment, income and taxation is generated indirectly by the project. Should the Company undertake an enhanced supplier development program whereby the amount of materials supplied by Newfoundland firms is increased, all of these impacts would increase, with employment increasing by almost 900 jobs for every 10% increase in the amount of goods and services sourced from Newfoundland firms.

The important thing here is not the specific numbers in the report but its confirmation of the point made earlier. It is incumbent upon the Proponent to provide, in its Benefits Plan, its own estimates of what it reasonably expects will be supplied by Newfoundland and Canadian suppliers, including as a result of enhanced supplier development programs implemented by the Proponent. Its failure to do so is a serious flaw.

4.4.3 Plan versus Actions

The Proponent, on numerous occasions during the public review sessions, has reviewed its strategy and actions with respect to maximizing Canada-Newfoundland benefits. In an attempt to demonstrate its seriousness and positive approach to delivering on this matter, the Proponent has pointed to its opening of a Newfoundland office early in the process; the conducting of significant studies and engineering work from this office; the location in St. John's of the major FEED contractor (Maersk) and the potential topsides subcontractor (AMKC) and its determined and costly exercise of re-bidding the topsides contracts with a view to achieving a "made in Canada/Newfoundland solution." Husky's actual performance in providing local benefits during its drilling programs has been held

up as exemplary. On more than one occasion the Proponent has received compliments from different Participants in the review process for its openness and visible expression of commitment. The Proponent invites us to look at its 'track record' and has stated "actions speak louder than words". It has also stated that, in fact, at times as an organization it is actually doing over and above what is required by its Benefits Plan. The Commissioner concurs that this is so.

With respect, to ignore the Plan is not an acceptable approach for a number of reasons. First, the written Benefits Plan is the document that is passed to contractors and subcontractors, and its provisions will guide their actions regarding local content and benefits. During the public hearings, the Proponent stated on a number of occasions that it would "require its contractors and subcontractors to honor the commitments made in the Canada – Newfoundland Benefits Plan". As such, the Plan must reflect exactly the Proponent's commitments and what it will be judged by and held accountable for. If it does not it is meaningless. As cautioned by the former Terra Nova Panel, without firm and specific commitments, the general assurances and statements of commitment will mean little as project circumstances change.

Achieving acceptable levels of benefits can only occur if benefit considerations are part of the corporate culture, similar to the way safety is viewed. It must permeate all decision-making levels of the organization and extend to all contractors and subcontractors. The further from the top, the more difficult it becomes. The diagram, Figure 4.1 shows the complexity of the process for topsides but there could be similar charts for the turret, the hull, life of field operating contracts, etc.

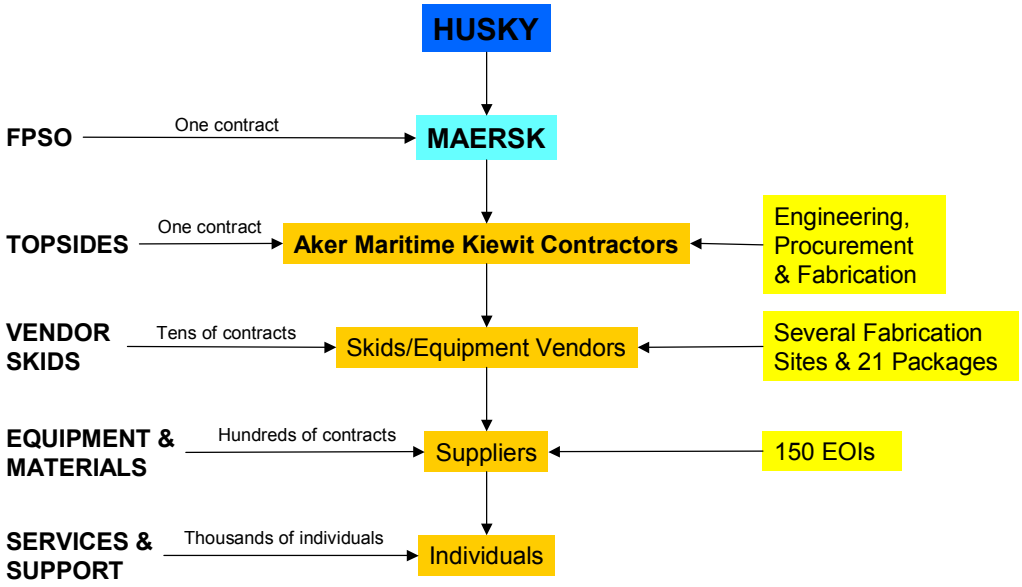

Figure 4.1
Schematic of Contracting Process

If the Benefits Plan is general in nature, it gives contractors too much flexibility and the ability to ignore local content and benefits considerations. Consider for example the situation with Maersk. This contractor is responsible for the FEED, for delivering a lump sum contract for the FPSO and other elements of the production system, and quite possibly will receive the life of field contract for providing and operating the FPSO on a lease or production services agreement basis. As we have seen, its subcontractor, AMKC, is doing all the current work regarding the topsides. Together Maersk and AMKC and other subcontractors deal directly with almost all suppliers and labor. As was brought up at one of the public sessions, Maersk and AMKC between them have in their hands the most important part of delivery of local benefits. Their only connection to the regulatory process is through the Proponent's Canada-Newfoundland Benefits Plan, a document in this case which is very general and where the commitments are so qualified as to be almost meaningless.

Second, the White Rose Canada-Newfoundland Benefits Plan, if accepted, will quite logically be the starting point for those planning the next development. If such generalities are accepted as the Plan for this project – irrespective of the activities and performance of the Proponent – then it is the Plan that will be held up as precedent for the next project, just as Terra Nova and Hibernia set the bar, albeit too low in some minds, for this project.

Third, it quite clearly is the written Plan that must be evaluated by the C-NOPB and approved as a pre-condition to considering the Development Plan.

4.5 Conclusions and Recommendations

Throughout this public review process the Commissioner has identified a substantial number of concerns and problems regarding the current approach to Canada-Newfoundland benefits. These concerns and problems have been raised in presentations to the Commissioner and identified through the Commissioner's own research and analysis. Results delivered by the current benefits approach are considered less than satisfactory by most.

Should the benefits actually achieved during the project stage of both Hibernia and Terra Nova have been better or are we doing okay? This is the question that is often asked and answered quite differently in different circles. One part of the problem is that information is not readily available publicly as to what benefits were expected at the beginning of these two projects. Without knowing what the specific goals and objectives were, how can we measure performance? Another part of the problem is that there are conflicting interpretations of the benefits provisions of the Atlantic Accord and the supporting legislation. These range from the very general to the very specific.

For example, with respect to goods and services, some contend that if the work can be done here, or if the goods or services can be supplied from here, then that is what should happen, irrespective of cost and productivity considerations. Those holding that view are

in the minority and no one seriously maintained that position in the public sessions. Others, including many in the oil and gas industry, contend that the only work that should be done locally is that which results from winning a bid through an international bidding process, which in effect means that, if the local firm has the best bid, it will not be discriminated against.

Both are extreme positions. Both are inaccurate. Neither can they be substantiated on any reasonable reading of the Atlantic Accord and the Accord Acts or maintained through an objective attempt to understand the spirit and intent of the Accord and its true importance. So, there must be a middle ground and a better way to do business. Those who made formal presentations to the Commissioner on this subject, without exception, took this approach and balanced their concerns with well-reasoned suggestions for changed procedures and improved results.

People want the White Rose project to go ahead under the right conditions. However, they are frustrated with the level of benefits being realized, in relation to the potential, and by the lack of a clear and acceptable interpretation of the provisions of the Atlantic Accord and the Accord Acts. They feel the spirit and intent of the Atlantic Accord has been gradually eroding.

A few recent, and what some would say relatively minor, observations give additional insight into where Canada-Newfoundland benefits considerations may fall in the everyday thinking and activities of some in the oil and gas industry. In July 2001, the Hebron Asset Team, lead by Chevron Canada Resources, announced that it had recently awarded three Hebron pre-development studies, the Turret study, the Subsea Systems study and the Topsides study. All three were awarded to firms based in Houston, Texas. There was no mention of Canada-Newfoundland benefit considerations in the release. On August 8th, 2001 Petro-Canada advertised for Expressions of Interest (EOI) for the provision of equipment and services for two exploration wells in the Flemish Pass Basin Offshore Newfoundland. There was no reference or mention of Canada-Newfoundland benefits considerations. In the Saturday, September 15th, 2001 *The Telegram*, Husky Energy advertised for a Senior Staff Drilling Engineer to be located in St. John's. There was no mention of first consideration to qualified candidates of the Province, as there was in a Petro-Canada advertisement of the same date.

It appears to the Commissioner that, in a general sense, many of these detailed concerns are really symptomatic of structural and administrative problems with the current benefits system and that no one, including the public, the supply and service industry organizations, trade unions, municipalities, proponents or the regulator are particularly satisfied with the current circumstance. Changes in procedure and approach are required for White Rose, for future projects, and for the industry generally

Proponent's Canada-Newfoundland Benefits Plan

There are major issues to be addressed in this aspect of the White Rose Development Application.

The provision of industrial and employment benefits, and other benefits such as in the area of research and development expenditures in the Province, in accordance with the economic growth objectives of both Governments, is an important aspect of the Atlantic Accord and its Implementation Acts. The Canada-Newfoundland Benefits Plan is the principal tool for delivery of these benefits, and an *approved* Plan is a pre-requisite or pre-condition to the approval of any Development Plan or work activity.

The Canada-Newfoundland Benefits Plan for White Rose is so general and qualified that it effectively leaves complete discretion on benefits matters with the Proponent and its contractors. It is impossible to get from the Plan itself a firm idea of what if any benefits will result from its implementation. Despite all the generally worded commitments and procedures in the Plan in favor of local benefits, it is conceivable and possible, that a fully completed FPSO, for example, with all its systems, could someday arrive at the White Rose site on the Grand Banks and start production with absolutely no Canada-Newfoundland direct labor or materials and equipment in the construction. There is nothing in the Benefits Plan to prevent this.

There are no firm or quantifiable goals or objectives for employment or for goods and services to which the Proponent can strive towards and against which its performance is to be measured. There are no meaningful lists of specific pro-active measures the Proponent is undertaking to ensure that the objectives will be met. There are no specific quantifiable commitments or expenditure estimates in the important education and training and research and development provisions.

Finally, the goods and services provisions are significantly qualified by clauses such as best value, internationally competitive, essentially equal, etc. There is no inclusion of local content or benefits considerations in the actual evaluation criteria for the selection of successful bidders. It is true that if the local or Canadian bidder has the best bid he/she will get the contract. In other words, local bidders will not be discriminated against.

None of these conclusions were even disputed by the Proponent.

For these reasons and others articulated previously in this chapter, the Plan is inadequate as written and cannot be recommended for approval. This is not to say that the Proponent has not demonstrated by its actions that in many respects it is sincerely trying to deliver substantial benefits. It is, and those actions of the Proponent are commended. It is not to say that the Proponent's attention to matters such as productivity, cost, delivery, technical considerations, etc. and concerns for protecting its decision-making autonomy and the viability of the project are not important. They are, and they have to be taken into account. But they have to be taken into account against the backdrop of the formal requirement and obligation of the Proponent to put forward a Benefits Plan that optimizes the employment and industrial benefits flowing to Newfoundland and to Canada. It is the contents of that Plan that will guide the individual decisions of the multitude of

contractors and subcontractors in the very complex web of the procurement process. It is the contents of that Plan on which the Proponent has to be judged.

Secondly, while the Proponent's positive actions and drive to "get on with the project" is seen by some to be commendable, its contracting strategy and very aggressive time frame create severe problems from a benefits viewpoint. While the Proponent has stated it is proceeding "at its own risk", there is no approved Benefits Plan against which to monitor the contracting procedures to date and consequently (or at least this is the understanding of the Commissioner) benefits monitoring has not been done by the C-NOPB. For the past several months the Proponent has been engaged in a pro-active campaign in an attempt to find what it calls "a made in Canada/Newfoundland solution" for the fabrication and assembly of topsides modules.

The Proponent is optimistic that such a solution will be found. There will even be expressions of relief in some circles if that is the case. However, this is only one of several major areas of contract activity, and there are many other areas that could benefit from their own set of pro-active efforts, for example, parts of the turret construction, or parts of the subsea system, or supply of materials and equipment to Samsung, if these contracts were to be subjected to them.

Further, the Proponent has stated that its intention is to fix, in a tentative fashion, the major contracts upon completion of the public review process. When that happens, the contractor and subcontractor supply trains are set already and can be influenced only minimally afterwards. In particular, the Proponent's stated approach would basically prevent any new approaches and efforts that might be recommended by the Commissioner and approved by the C-NOPB from being implemented in time to positively influence the achievement of increased levels of Canada-Newfoundland benefits in the important materials and equipment supply aspect of the White Rose project execution phase.

Recommendation 4.1
The Commissioner recommends that the Board not approve the Canada-Newfoundland Benefits Plan, Volume I of the White Rose Development Application, for the reasons outlined in this chapter.

Recommendation 4.2
The Commissioner recommends that the Board invite the Proponent to re-write its Benefits Plan to correct the deficiencies identified by the Commissioner and to reflect the improvement suggestions outlined below. The Commissioner envisages that this can be done in consultation with the Board and the revised Benefits Plan can be resubmitted to the Board in a matter of a few weeks, without necessarily disrupting the Board's stated approval decision schedule for this fall. For ease of reference, the improvement suggestions include:

- **Provide, as an integral part of the Benefits Plan, realistic estimates, in terms of specific levels and quantifiable objectives, of what benefits the**

Proponent expects will be achieved through implementation of the Benefits Plan. These *quantifiable objectives* or *targets* should be expressed in terms such as dollar amount of goods and services procured, percentage of total dollars spent, percentage of construction contracts awarded, person-years of employment and/or similar quantifiable units. These targets represent thresholds to be strived for and subsequently are to be used as benchmarks against which progress can be measured.

- **Provide, as an integral part of the Benefits Plan, *tools* in the form of firm pro-active programs or initiatives that will be utilized by the Proponent and its contractors and subcontractors as they strive together to meet the stated quantifiable objectives or targets. There should be a list of these *tools* for each major category of benefits, namely: employment; education, training and technology transfer; goods and services; and research and development.**

- **Provide, specific initiatives to promote training, recruitment, retention and promotion of women for the White Rose Project and amend the Benefits Plan to reflect the commitment to "defined objectives, quantifiable targets, and measurable outcomes" contained in the Proponent's June 8th Additional Information document.**

- **Re-address the procurement and bid evaluation procedures for goods and services, and in particular, the Proponent's qualifiers 'internationally competitive', 'best value', 'essentially equal'. Local content must be included as one of the selection criteria in the definition of 'best value'.**

- **Formally require all contractors and subcontractors operate as if they were the Proponent with all of its responsibilities and obligations under the Benefits Plan, and remove such catch-all escape clauses as require contractors "to comply to a *reasonable* degree", "major contractors will be *encouraged* to conduct a thorough assessment of… local facilities", etc.**

- **Provide specific research and development programs and expenditure commitments in line with a goal of creating the proper longer-term economic environment and business community appropriate to a "major oil and gas producer" or of developing a sustainable oil and gas industry.**

- **Update Chapters 5 and 6 of the Proponent's Benefits Plan with current information. For example, as mentioned earlier, Table 6.10-1 shows total direct labor requirements at approximately 12.2 million person-hours. Information presented in the June 8th response to the Commissioner provided tables totaling 21.9 million person-hours. These were subsequently corrected in Tables 4.1 and 4.2 shown in this chapter which total 19.3 million person-hours. It is most likely that Table 5.12-1,**

Consumables Requirements Summary and Table 5.12-2, Contracted Services Requirements Summary need similar updates.

- **Correct a variety of inconsistencies, such as the various references in the Plan to the fact that Canada-Newfoundland benefit considerations are part of the bid selection criteria whereas they are definitely not included in the best value definition; section 2.3.4 of the Plan ignores the Accord principle recognizing the right of Newfoundland and Labrador to be *the* principal beneficiary. The Company's position was corrected at the public sessions and this should be reflected in the Plan.**

Recommendation 4.3
The Commissioner recommends that the Board require the Proponent to reflect the results of its new pro-active programs in its quantifiable objectives or targets for the project and that, concurrent with the re-writing of the Benefits Plan, the Proponent and its contractors engage in an intensive effort to maximize the Canada/Newfoundland content in all major contract areas in the project phase in accordance with the provisions to be included in the new Plan.

Recommendation 4.4
The Commissioner recommends that the Board evaluate and make a decision on the Proponent's revised and re-submitted Canada-Newfoundland Benefits Plan prior to making a decision on the Development Plan.

Additional Measures for the C-NOBP

In addition to requiring an improved Benefits Plan, the Commissioner feels the Board needs to play a pro-active role in benefits administration and it needs to do so early in the process. The Commissioner believes such a responsibility is contemplated in the Accord and the Accord Acts (see section 4.3). It is also necessary from a practical perspective. The full effectiveness of the recommended improvements for the contents of a Benefits Plan (as above) can only be realized if they are complemented by a firm presence on the part of the C-NOPB. Take for example, the procurement by contract of goods and services. During the public review process the Proponent explained its reluctance to provide estimates of materials and equipment to be supplied locally until contracts are fixed. At the time, a statement was made to the effect that "once we know which contractors are chosen then we will know the level of benefits". At present, both the Proponent of a project and the Board spend considerable resources and effort in monitoring the contractor's performance during contract execution and in after-the-fact auditing. This is important, but it is not as important as pro-active efforts early in the process to ensure that Canada-Newfoundland benefits are maximized during the request for proposals and the bidding stage. In specific terms, the current approach strives to ensure a contractor actually meets his commitment of say 9% local content in his contract. The recommended approach strives to obtain what might be a significantly higher level of local content commitment, say 18%, through pro-active efforts at the start of the bidding process, and thereafter looks to monitoring to measure performance.

The question of gender equity in the oil and gas industry is also important. The presentation of the Women in Resource Development Committee was directed primarily to the Board, which the Committee believes should play a pro-active role in establishing the requirements of a proper gender equity program, provide the consultation and communication mechanism, and establish the reporting and monitoring procedures. Further, the Committee recommends that, pursuant to Section 45 (4) of the Canada Newfoundland Atlantic Accord, the Board designate women as a disadvantaged group, using the Federal Employment Equity Act as a model. It is the Commissioner's view that the formidable barriers to equitable participation for women in the oil and gas industry need to be addressed. Further, the Commissioner believes the preferable approach to address this important issue is for the Proponent to provide specific initiatives in its Benefits Plan, as per Recommendation 4.2, and also for the Board to take a pro-active approach by outlining in new guidelines its key gender equity requirements and related reporting and monitoring procedures.

Finally, it is the Commissioner's belief that the Petroleum Producers want to be good corporate citizens, they want to help build the communities in which they operate, and they tend to co-operate and contribute fully if they know the rules of the game. With Hibernia in production, Terra Nova about to start, White Rose seeking regulatory approval, Hebron in the planning stages and on-going exploration programs, they need to know more clearly what is expected of them. Other stakeholders need to know this as well so their actions can be guided accordingly. Thus, it is the Commissioner's view that the C-NOPB should issue a definitive statement as to how it interprets the Accord and how it will implement or administer its responsibilities, including specifying more clearly its expectations in a model Benefits Plan.

Recommendation 4.5
The Commissioner recommends that the Board (after consideration of the Commissioner's interpretation of the Atlantic Accord and the Accord Acts, his advice on the Board's responsibilities in this area of Canada-Newfoundland benefits, and his advice on adoption of an improved system of benefits administration, as outlined in this Chapter 4) release publicly a definitive statement as to how the Board intends to interpret the Atlantic Accord and the Accord Acts and how the Board will implement or administer its benefits responsibilities, including requirements for, and evaluation of, the Benefits Plans.

Recommendation 4.6
The Commissioner recommends that the Board update Chapter 5 of its Development Application Guidelines entitled Canada-Newfoundland Benefits Plan, dated December 1988, so that these guidelines clearly specify these new Benefits Plan requirements and, in the appropriate level of detail, outline what is expected from Proponents.

5 HUMAN SAFETY AND ENVIRONMENTAL PROTECTION

The Commissioner's Terms of Reference require that the public review of the White Rose Project include, *"considerations of human safety and environmental protection incorporated into the proposed design and operation of the Project"*. As such, this chapter reports on presentations to the Commissioner and provides the Commissioner's findings with respect to human safety and environmental protection.

5.1 Human Safety

There are considerable threats to health and safety in any offshore oil project. Sound management practices, safety procedures and a degree of humility as implied by the precautionary principle are required to reduce the risk that such threats might result in damage to health and safety. The Proponent's Preliminary Safety Plan recognizes the overriding importance of safety:

> In the responsible conduct of its business, Husky Oil Operations Limited (Husky Oil) is committed to ensuring that the safety of its personnel is not compromised. Safety transcends exploration, drilling, production, and corporate image in importance, and will not be sacrificed for the sake of expediency. Husky Oil is also committed in its obligation to diligently minimize any adverse effects to the environment, as a result of the Company's activities.

On the first day of the public sessions, and in subsequent presentations, the Proponent clearly articulated the priority it places on the area of health, safety and environment (HSE) in its operations. The Proponent's HSE policy governs all its activities and focuses on providing leadership throughout the company on these matters, making HSE a responsibility for all employees and contractors and holding people accountable for their performance. Monitoring results and continuous improvement are also integral to the process.

In describing the components of its HSE management system, the Proponent emphasized the importance of such issues as training, employee rights and individual responsibility. These issues were also addressed in submissions by Participants and in subsequent discussion during the public sessions.

A Preliminary Safety Plan and a Concept Safety Analysis was submitted to the C-NOPB by the Proponent as Volume 5 of its Development Application. Despite the technical nature of aspects of the volume and the preliminary nature of the information it contains, the submission of the document for public review was helpful to the review process and represented an improvement over the public review process associated with the Terra Nova project. In the Environmental Assessment Panel's report for that project, the Panel expressed concern that the safety plan was not included in the EIS and therefore not even considered in the public hearings for that Project.

The White Rose Safety Plan is based on internationally recognized systems and builds on the safety plans of other operators in the Newfoundland offshore. The Proponent notes that further studies are required as the production system design is finalized in order to complete the first version of the Safety Plan and the Concept Safety Analysis. Afterwards, the Plan will be modified on an on-going basis to incorporate new technology, once it is proven, as well as to respond to industry experience and regulatory developments.

During the public sessions, the Federation of Labour presented a commentary and posed a number of questions with respect to the Safety Plan. Several questions could not be answered because the plan had not been finalized. In response to the Federation's request that the final version of the Plan be made available for public comment, the Proponent suggested that it is a very complex document and that it is unlikely that it would be made available for public review. It is the Commissioner's view that an open and transparent approach to safety issues will be of benefit to the Proponent, as well as being in the public interest, and that it is desirable for the Proponent's Safety Plan to be made available for public comment.

5.1.1 Regulatory Issues for Occupational Health and Safety

During the public sessions a number of concerns were raised with respect to the occupational health and safety regulatory regime for the Newfoundland offshore and the C-NOPB's role in that regime. These concerns pertain to jurisdictional aspects of the legislative and regulatory framework for occupational health and safety offshore, the financial and other resources of the Board to address occupational health and safety issues and the perceived conflict between the Board's mandate with respect to occupational health and safety and its other responsibilities.

Jurisdictional Aspects

The Board regulates safety through enforcement of the relevant sections of the Accord Acts, the Newfoundland Offshore Area Production and Conservation Regulations, the Certificate of Fitness Regulations, the Production Installations Regulations, and by establishing, as a condition to its work authorizations, that operators comply with the draft Occupational Health and Safety Regulations.

Several participants submitted that the legislative and regulatory framework for occupational health and safety offshore is confusing and incomplete. The Board administers certain provisions of the provincial Occupational Health and Safety Act through a Memorandum of Understanding with the provincial Department of Labour. However, the status of certain elements of that Act, particularly those not specifically covered by the Accord and Accord Acts, is not clear to several participants. This confusion is increased by the fact that the occupational health and safety regulations under the Accord Acts have remained in draft format for at least 11 years. The result is that many issues are not adequately addressed in the regulations. These include the right of workers to be informed of dangerous situations, to refuse unsafe work and to be

involved in health and safety committees. While the Proponent was commended for its own commitments in these areas, some participants wished to see such matters legislated.

The Board has the authority to regulate the health and safety issues through the continued use of draft regulations, however the indirect approach of making compliance with the draft regulations a condition of approvals does not represent best practice. In any event, it is hard to contemplate that draft regulations written 11 years ago are still current given the changes in technology and the experience gained offshore over that period. The Board, as well as the federal and provincial governments which are responsible for the enactment of regulations, should diligently carry out their respective responsibilities to see the draft regulations promulgated as soon as possible.

The Commissioner notes that the discussion of these issues would have been facilitated by representation from the Department of Labour and/or the Board who could have commented on the status of the regulatory framework without having to comment upon the merits of the Proponent's Development Application.

Resources Required for the Occupational Health and Safety Regulator

The Newfoundland and Labrador Federation of Labour argued that the Board was not adequately funded to properly regulate health and safety. The continued existence of draft occupational health and safety regulations also suggests a lack of resources to adequately address these issues. Indeed, the Board's most recent annual report makes reference to the growth of the offshore sector and the resulting challenge to the resources of the Board. The annual report describes a number of safety related initiatives undertaken by the Board, including audits of facilities against regulations and corporate procedures.

As new technology is continually developed and deployed in increasingly challenging environments, the C-NOPB must be provided with the resources not only for audits against existing statutes, regulations, approved plans and procedures and conditions attached to authorizations, but also to ensure that the regulations themselves keep pace with changing technology. Furthermore, a pro-active research agenda addressing health and safety issues as they apply to the Newfoundland offshore should be pursued and the Board must have adequate financial resources and sufficient appropriately trained staff to enable it to take such an approach.

Safety and the Board's Overall Mandate

During the public sessions, concern was also expressed about the relationship of safety aspects of the Board's mandate to the Board's other responsibilities. Participants suggested that there is a tension or conflict between the Board's responsibility for resource development and its responsibility for safety. They cited both a 1997 report by the provincial government and the Cullen Report on the Piper Alpha disaster as having identified potential risks associated with having the same agency responsible for both production and safety. It was suggested that the Board's reporting structure - to the federal Minister of Natural Resources and the provincial Minister of Mines and Energy -

is reasonable for the Board's development responsibilities, but is not adequate for safety issues since neither department has expertise or responsibility for occupational health and safety.

Both the United Kingdom and Norway directly and formally involve the agencies and departments with expertise in health and safety in their offshore regulatory regimes. Following the Piper Alpha disaster in the UK, responsibility for offshore health and safety was moved from the Department of Energy, which had previously performed the same functions as the C-NOPB, and placed with a newly created division of the Health and Safety Executive. In Norway, the Petroleum Directorate still monitors health and safety offshore, but it reports directly to the Norwegian Ministry of Local Government and Labour on such issues. For other areas, the Petroleum Directorate reports to the Ministry of Industry and Energy.

The Commissioner does not see a real conflict between the C-NOPB's responsibilities for safety and its responsibilities for resource management. However, given the increase in activity offshore and the requirement for additional resources to regulate health and safety concerns, as well as the need for reporting structures and assignments of responsibility that effectively and efficiently use the expertise of government departments, the Commissioner sees potential merit in directly involving the relevant federal and provincial departments in health and safety matters. There may also be merit in splitting the reporting structure so that the C-NOPB reports to different departments for health and safety issues than it does for resource management issues.

Conclusions and Recommendations

There was considerable discussion of safety issues and their regulation and enforcement during the public sessions. The Commissioner agrees that draft regulations originally developed 11 years ago must be updated and enacted. To effectively and pro-actively regulate the safety issues in such a technically sophisticated and demanding sector as offshore petroleum development, the Board must be given adequate resources. Appropriate reporting structures can also ensure that the Board is functioning as effectively as possible. In the spirit of continuous improvement and in light of the presentations during the public sessions, the Commissioner believes there are opportunities for improvement in the regulatory regime for offshore safety. However, the Commissioner has not had the benefit of hearing the views and perspectives of the Board and the relevant government departments on these issues to complement the views raised by the Participants. Nevertheless, these issues need to be addressed and the suggested solutions put forward at the public sessions need to be given serious consideration by those responsible.

Recommendation 5.1
The Commissioner recommends that the Board and governments take appropriate action in accordance with their responsibilities with reference to the occupational health and safety issues raised. The Commissioner further recommends that the Board, as the regulatory body, take the initiative. A forum which would include industry, labour, the relevant departments of government and others interested in

safety to review these matters in depth is suggested. Results of the forum and follow up action should be reported publicly.

5.1.2 Operations Safety Issues

Command Structures

During discussion of the command structure on board the FPSO, the need for a well-understood and unambiguous decision making structure was widely acknowledged. The potential for ambiguity arises from the classification of the FPSO as a ship when it is disconnected from its moorings and as a production facility when it is moored at the site and connected to the subsea facilities. In the first instance the FPSO is subject to marine law and the Canada Shipping Act and would be under the command of the marine lead who is required to be a qualified Master Mariner. In the second instance the FPSO would be under the command of the Offshore Installation Manager (OIM).

While noting that the final organization structure for the Project has not yet been established, the description of the command structure on the FPSO in the Proponent's Preliminary Safety Plan describes the OIM as responsible for all activities in the field including health, safety and welfare of all personnel and emergency procedures. During an emergency or threatened emergency the OIM will determine whether to initiate evacuation procedures and he or she is the final authority for responding to critical incidents such as fires/explosions, vessel collisions, loss of well control and decisions concerning courses of action during heavy weather.

The issue of command structures was addressed by the Terra Nova Environmental Assessment Report (EAP) Report and was a particular emphasis of the presentation from the Newfoundland and Labrador Wildlife Federation, which quoted extensively from the Terra Nova EAP report in their submission to the White Rose Public Review.

During the public sessions the Proponent provided further explanation of the command structure on the FPSO and the role of the Master Mariner. The Proponent stated that the FPSO will always have a Master Mariner and marine crew on board and the Master Mariner will be the principal advisor to the OIM in all marine-related matters, including for weather and sea-state issues. The Proponent also stated that the Master Mariner would be the person to decide whether the FPSO would disconnect. However, this statement is not as clear as it initially appears and it does not ultimately resolve the issue since the authority to disconnect is only transferred to the Master Mariner by the OIM if and when the OIM determines that there is a potential requirement for disconnection. It is therefore the OIM who decides that conditions are such that processing facilities should be shut down and the lines flushed. In the end, the OIM remains responsible for the decision to begin the chain of events that would lead to a disconnection and the point at which the Master Mariner would decide to actually disconnect is only reached if the OIM has already decided that there is a potential requirement for disconnection.

Despite assertions by the Proponent that the FPSO will not have to disconnect due to heavy seas, the Grand Banks can be a notoriously harsh environment and, at this time, there is no operating history for FPSOs on the Grand Banks on which to base the Proponent's assertion. While the Proponent has designed the FPSO to remain in place during 100-year storms, if faced with such a situation, or in fact any combination of significant events where the integrity of the ship is threatened, the Commissioner believes that an experienced Master Mariner should determine the prudent course of action. The Proponent's resistance to have the Master Mariner responsible for marine safety matters and vessel integrity appears to be inconsistent with its own statements about the critical role of the Master Mariner.

In a professional environment a qualified and competent OIM and Master Mariner can be expected to wisely enact a transfer of responsibility as described by the Proponent. However, the potential harsh sea states and weather conditions of the Newfoundland offshore require that any potential ambiguity be eliminated and that the final authority at all times for issues of vessel integrity and marine safety including weather conditions and ice avoidance, should be an experienced Master Mariner.

Recommendation 5.2
The Commissioner recommends that the Board require that an experienced Master Mariner be the person responsible for the vessel integrity aspects of the White Rose FPSO and for issues of marine safety. The Commissioner further recommends that the Master Mariner have the authority to order the commencement of the disconnection process, including shutting down processing equipment and flushing lines, and to decide if and when the FPSO actually disconnects.

Practicing Quick Disconnect.

During an emergency or potential emergency, the ability of the FPSO to successfully disconnect will depend upon the effectiveness of the decision-making structure and the confidence and competence of the operators in executing a decision to disconnect. During the public sessions it was suggested that there must be sufficient experience in disconnecting the FPSO from the spider buoy in order to gain a comfort level that this process works. The Commissioner agrees with this view. The practice or test disconnections should also include quick disconnect operations in a simulated emergency situation. Disconnect exercises should be monitored and an evaluation report produced in order to provide feed-back for solving problems and to achieve continuous improvement.

Recommendation 5.3
The Commissioner recommends that the Board require that the FPSO disconnect operation, including the quick disconnect in a simulated emergency situation, be thoroughly tested during commissioning. The Commissioner further recommends that regular practice disconnects, including complete disconnects from the spider buoy, be held at a frequency as determined by the Board but sufficient to allow operators to be comfortable with the procedure.

FPSO Operational Safety

FPSO systems for offshore oil production have become increasingly common. Initially, FPSOs were developed to operate in mild wave climates but over the past decade they have gained acceptance in harsher climates such as the North Sea. Nevertheless, they remain an evolving technology as they are applied to increasingly harsh environments. The number of 'firsts' expected to be demonstrated by the successful operation of the Terra Nova FPSO is evidence of this evolution.

In response to the increasing use of FPSOs worldwide and several incidents of FPSOs suffering damage from wave impacts, several industry studies addressing the safety of such vessels have been completed or are ongoing. Indeed, considerable research is underway to develop tools and models to adequately assess the effects of heavy seas on FPSOs. Such safety concerns were not adequately noted in the Proponent's Development Application.

A study on the operational safety of FPSOs by NTNU/Preventor, a joint venture between the Norwegian University of Science and Technology and a risk management consultancy, found that aspects of risk assessments on FPSOs were not sufficiently thorough and were sometimes not given sufficient attention during design. The study found that potential causes of loss of operational safety control need to be identified sufficiently early in the design work to allow proper treatment in design and operational planning.

FPSOs have operated successfully in harsh climates. They do not, however, have a proven track record of operation on the Grand Banks, nor have operations in other harsh climates been completely without incident. Furthermore, the White Rose FPSO is based on a tanker design, which has no operating history as a FPSO. The Proponent indicated that some model testing of the FPSO hull had been done at the Institute for Marine Dynamics and further testing was ongoing during the public sessions. These tests included issues related to the safety of the FPSO design such as fatigue analysis, greenwater analysis and mooring analysis.

Recommendation 5.4
The Commissioner recommends that the Board review the full results of all model testing on the proposed FPSO hull for White Rose and confirm that these results demonstrate its safety for the Grand Banks environment before approving the production system design. The Commissioner further recommends that on-going monitoring of the structural integrity of the vessel be required.

Coincident Extremes

During the public sessions several participants raised questions about the temporary safe refuge areas and evacuation procedures on the FPSO. During the ensuing discussions the Proponent stated that the FPSO is designed to stay on location regardless of weather conditions. This led to questions regarding coincident extremes. For example, the Proponent was asked by the Commissioner about the procedure during coincident

extremes of icebergs and heavy seas. In response, the Proponent stated that the FPSO would simply disengage in such circumstances. Given that disengagement due to heavy seas is not normally anticipated, the question remains as to whether the FPSO is capable of disengagement in such weather conditions. Similarly, if an accidental event were to take place during high winds and heavy seas, what would the procedure be?

The Concept Safety Analysis is a highly technical document which will not be completed until further design work is done. As a result, the Commissioner believes that the completed document should be carefully reviewed by the Board in light of the scenarios discussed above.

The Commissioner also notes that in response to a Terra Nova EAP recommendation on the topic, the C-NOPB did not address the matter of coincident extremes as raised by the Panel and only confirmed that the Terra Nova safety plan complied with the prevailing regulations which required consideration of simultaneous environmental processes. Unfortunately, a catastrophic situation often involves the failure of several systems simultaneously and often reflects a combination of events aggravated by mechanical failure and/or human error that may have been unforeseen in safety planning. Consideration should be given not only to combinations of environmental threats and accidental events, but simultaneous *extremes* of such combinations.

Recommendation 5.5
The Commissioner recommends that the Board require that the Proponent's operational safety planning, including its evacuation plans, consider the simultaneous occurrence of two or more extreme events, involving accidental events in combination with wind, sea and ice. The Commissioner further recommends that the ability of the FPSO to disconnect during heavy seas and high winds should also be assessed.

Ice Management

The Proponent has been active in exploration on the Grand Banks since the 1980s and has had an Ice Management Plan in place throughout this time. The White Rose Ice Management Plan will be based on this substantial experience, although the plan will not be finalized until the design of the proposed FPSO system is complete.

To determine whether a physical ice management procedure will have to be attempted or the facility will have to be secured and prepared for a possible move, one of four questions that form part of the assessment and management component of the Ice Management Plan is whether the ice is in excess of the design criteria of the facility. The Development Plan states that, "the FPSO will disconnect from its mooring on the approach of an unmanageable iceberg of mass greater than 100,000 t. The hull and moorings will be designed to withstand impact with icebergs up to this weight". During the public sessions the Proponent was asked to clarify whether this meant that the FPSO would remain moored when threatened with a collision with an iceberg of less than 100,000 t. In response to this discussion, the Proponent submitted a clarification document which stated that "Husky's operating philosophy is based on the avoidance of

all potential collisions with icebergs…". The role of the design criteria of the FPSO as it pertains to ice impacts was described as an extra layer of protection in the event that detection and management failed, and, presumably, there was insufficient time to disconnect.

The clarification document identifies avoidance as the operational philosophy for the Proponent's ice management system and reviews the various detection and assessment methods in the system. The timelines and ice zones involved in making a disconnect decision are also discussed. However, no criteria are provided to determine whether an iceberg is of sufficient size and weight to trigger the establishment of the ice zones. This critical omission, together with statements in the Development Application that clearly imply that the FPSO would remain on station when threatened with collision with icebergs within its design criteria, is unacceptable.

The discussion during the public sessions revealed a lack of clarity on this issue. In response to the apparent contradiction between the operating philosophy of avoidance and these statements in the Development Plan, the Proponent did not feel it necessary to amend the statements in the Development Plan and simply reaffirmed its commitment to a conservative management approach.

Ice and icebergs can represent a considerable threat to operations on the Newfoundland offshore area. The Commissioner agrees that, with prudent and unambiguous management systems, the associated risks can be reduced to a reasonable level. The overall principle of avoidance, espoused in the Proponent's ice management system, is a sound approach. Reasonable confidence in detection systems and monitoring can only be achieved through multiple overlapping systems which the Proponent has adopted. The Proponent also has considerable experience in physical management of ice and icebergs.

However, the assessment component of the ice management system remains deficient, not in terms of the definition of zones which was adequately explained, but in terms of the lack of a clear criteria for the establishment of these zones and the initiation of disconnect procedures. To remedy this situation a clear statement as to the size of an iceberg that would trigger the start of the disconnect process as well as a method to determine the size of threatening icebergs is needed.

Recommendation 5.6
The Commissioner recommends that the Board require that the Proponent's Ice Management Plan explicitly affirm the principle of avoidance of collisions with icebergs and establish prudent criteria for the mass of an approaching iceberg that would initiate disconnect procedures and an identified process to determine whether icebergs meet these criteria.

5.1.3 Worker Safety / Employee Issues

Work rotation schedules are an important issue with potential occupational health and safety implications. It is therefore surprising that the issue is not addressed in the

Development Application. The Newfoundland and Labrador Federation of Labour stated that the risk of an accident increases with shift work as workers become fatigued. The Proponent is tentatively planning to operate on a 21 day rotation similar to the Hibernia and Terra Nova projects. However, the Proponent is also currently examining the issue, including by collecting data on accidents during exploration programs to determine how shift schedules might affect the accident rate. The Commissioner is also aware that the Proponent has provided financial support for a study of the effects of shift rotation schedules on operational safety, workplace stress and family life. Furthermore, the Proponent indicated that it is willing to provide data on accidents and their relationship to scheduling to interested parties. The Proponent is to be commended for these actions.

The Newfoundland and Labrador Building and Construction Trades Council and the Newfoundland and Labrador Federation of Labour raised a number of worker involvement and safety issues. During the ensuing discussion in the public sessions, the Proponent confirmed statements in its Development Application that workers will be represented on health and safety committees. The Proponent indicated that worker representatives are chosen by a variety of methods including volunteering, election by peers or, as a last resort, through appointment by management. The Proponent indicated that election by peers is preferred and is expected to be the method used to choose worker safety representatives for White Rose. The Proponent also confirmed that all employees will not only have the right but the obligation to stop dangerous work and that procedures will be in place in that regard. While the Proponent expressed its view that such procedures do not need to be legislated since they are a normal part of how the Proponent conducts its operations, the Commissioner sees no reason why legislating a prudent and currently practiced procedure would be inadvisable.

A number of Participants addressed the need for safety training, medical treatment, participation of labour groups in safety planning and training and related issues. It was pointed out that while the FPSO is an accepted technology with considerable experience throughout the world, including in some areas with sea states comparable to the Grand Banks, FPSOs are new to the Grand Banks and some aspects of the FPSO technology are new to many of the operators involved in the Newfoundland offshore. The use of FPSOs introduces a host of marine related issues which are not relevant to fixed platform modes of development. This reinforces the already critical need for comprehensive safety training.

Many of the worker involvement and safety issues raised during the sessions were concerned with government regulations as well as the Proponent's plans. The Commissioner has not recommended specific measures to address these matters since some procedures and plans are still being finalized by the Proponent and others require government input. As a result, these matters can best be addressed by the Board's own review of the Development Application.

5.2 Environmental Protection

As noted at the beginning of this chapter, the scope of the White Rose Public Review included the environmental aspects of the Development Application. Environmental issues were also addressed by the federal environmental assessment process in a separate review. Before the start of the Commissioner's public sessions, the federal environmental assessment process had been satisfied to the point that the federal Minister of Environment had determined that the White Rose Offshore Oil Development "is not likely to cause significant adverse environmental effects". In making that decision, the Minister referred the Project back to the Responsible Authorities (C-NOPB, Environment Canada and Fisheries and Oceans Canada) for action under Section 37 of the Canadian Environmental Assessment Act. That section addresses follow-up studies associated with mitigation and monitoring during Project construction, operation, emergency events, decommissioning and post-decommissioning.

During the public sessions, several Participants spoke on environmental and related topics. As a result, the Commissioner's report with respect to environmental issues includes issues that have already been addressed by the federal assessment process. Unfortunately, the Commissioner's ability to address fully this aspect of the mandate was constrained by the fact that the various agencies and government departments concerned did not participate in the public review process. Thus, the Commissioner's scope of comments are based on the material provided by the Proponent and Participants, as well as on a review of the written material made public through the federal environmental assessment process. The comments and recommendations contained in this section are intended to inform the C-NOPB's own review of the Development Application and assist it in designing appropriate follow up programs under CEAA. Among the issues presented, the major ones identified include transparency in environmental management, environmental assessment methods, operational discharges, effects on seabirds and effects on fish and the fishery.

5.2.1 Transparency

Several Participants expressed concern that the C-NOPB and the industry generally seem to operate behind closed doors. Members of the former Terra Nova Panel addressed the perception that this is a continuing problem, pointing out, for example that the C-NOPB web site does not disclose spill records, accident reports, infractions of guidelines and other information in the public interest.

Availability of reports and information was also a concern for other Participants. The fact that environmental audits are generally not made public exacerbates the concern over transparency and, as noted by a Fish, Food and Allied Workers (FFAW) representative, it is not possible to "drive by" the production facilities to determine if a potential threat to public safety or the protection of the environment exists. It is encouraging that the Proponent, and other companies active in the Newfoundland offshore, have consented to making considerable information available to interested parties. However the

Commissioner believes that there will be cases in which this access should be as a matter of right, and should not depend on the consent of a particular Proponent.

Recommendation 5.7
The Commissioner recommends that the Accord Acts be amended to allow the Board to disclose information in respect of which section 119 of the federal Accord Act and section 115 of the provincial Accord Act presently apply, where such disclosure is in the interest of public safety or the protection of the environment.

5.2.2 Environmental Assessment Methods

The Proponent states that "the methodology used in the White Rose Oilfield EIS to predict environmental effects, including cumulative effects, is well founded in literature and practice." Nevertheless, several Participants criticized the assessment methodology.

Significance Criteria

A number of Participants questioned the significance criteria used by the Proponent. The Natural History Society noted that qualitative descriptors were used extensively as opposed to modeling with numeric probabilities. They criticized the general application of significance criteria which did not distinguish between different species. Members of the former Terra Nova Panel, the Canadian Nature Federation, the Fisheries Association of Newfoundland and Labrador and the FFAW echoed this concern. According to the members of the former Terra Nova Panel, "there is a simplicity in this scaling that is misleading". As pointed out by the FFAW, the magnitude of a 10% reduction in the population of a valuable species like crab could have a very serious impact on the Newfoundland economy, yet could be rated of low magnitude according to the criteria established by the Proponent.

To cite one example, the "not significant" impact prediction made by the Proponent with respect to marine birds was challenged by the Natural History Society through a discussion of the criteria applied. Their submission makes the point that "an effect considered insignificant by the Proponent could kill up to 10% of a bird species entering an area up to 100 km^2 for a duration of up to a year". They suggest that such an impact is in fact significant, since "small increases in adult mortality in a population that begins breeding relatively late in life and only lays one egg a year, as is the case for most birds of concern here, can create population declines." The Natural History Society concluded that "one reason very few significant adverse effects are predicted to occur is that the significance criterion is appropriate only for catastrophic events, such as a major blowout or spill."

Having considered the comments made during the public hearings and having sought advice in these matters, the Commissioner is concerned that the criteria used to establish significance appear so constructed as to make it unlikely that any significant impact could be predicted. The method of measurement ("professional judgment") would appear to be uncertain, and the subject of measurement unclear. In light of these concerns, the Board

should ensure that rigorous environmental effects monitoring and mitigation measures are put in place to verify the effects predictions and that provision is made for meaningful stakeholder participation.

Recommendation 5.8
The Commissioner recommends that the Board take into account the concerns raised during the public sessions regarding the significance criteria and the resulting determination of significant effects in designing the follow-up program for the White Rose Project as required by the Canadian Environmental Assessment Act. The Commissioner further recommends that the Board seek to achieve continuous improvement in impact assessment methodology, including the determination of significance criteria, through development of stringent guidelines for Proponents.

The Precautionary Principle

The Precautionary Principle as enunciated by the Rio Declaration on Environment and Development states that "when there are threats of serious or irreversible damage, lack of full scientific certainty must not be used as a reason for postponing cost effective measures to prevent environmental degradation." The C-NOPB and the Proponent have expressed their agreement with the Precautionary Principle and the Proponent believes that the Development Application is consistent with it.

A useful means to translate the Precautionary Principle into practice is seeking to address pollution control issues by reducing discharges to the maximum extent that is technically and economically feasible, as opposed to an approach which seeks only to comply with regulated standards. In some areas, commitments made by the Proponent fall short of addressing the spirit encompassed by the Precautionary Principle. For example, the Proponent can demonstrate improved environmental performance with respect to controls on oil content of produced water discharges and of drilling mud and cuttings. The capability exists to achieve a level of oil recovery which exceeds currently regulated standards. The Proponent has confirmed that such a technical capability exists. Since there continues to be uncertainty with respect to the long term effects of such discharges, a precautionary approach would call for a minimal discharge approach, provided such reductions are technically and economically feasible. In this regard, and in several other instances, the Proponent has only committed to meeting the legislated requirements.

Members of the former Terra Nova Panel suggested that a precautionary approach become a fundamental operating principle, such that during operations the Precautionary Principle is consistently and rigorously applied to unplanned events as well as to planned ones. Such an approach represents an enhancement of the application of the precautionary principle described above, in that it seeks to embed the principle in operational decision-making rather than using it only in the planning and design stage.

Recommendation 5.9
The Commissioner recommends that the Board require that the Precautionary Principle be fully integrated into both the planning and the operational decision-

making for the White Rose Project and that the Board specifically require the use of best available proven technology in all aspects of the Project, including with respect to minimizing the discharge of pollutants.

Cumulative Effects

The scope of cumulative effects assessment was consistent with CEAA guidance. Nevertheless, it was curious to note that in no case were the attributes of the predicted impact altered from those predicted solely with respect to the Project, a somewhat optimistic judgment at best. Several commentators, including the Fisheries Association of Newfoundland and Labrador, the former Terra Nova Panel and the Fish, Food and Allied Workers challenged the scope of the cumulative impact analysis carried out, and questioned the conclusion that the cumulative effects of the Project were not significant. These Participants remained concerned about the cumulative environmental effects of the expansion of offshore oil activities on the Grand Banks.

Reference was made to the findings of a Cumulative Impacts Workshop convened by the C-NOPB in response to the recommendations of the Terra Nova Panel. The workshop had concluded that regional integrated monitoring programs must be established. The former Terra Nova Panel suggested that the Department of Fisheries and Oceans (DFO), in light of its responsibilities under *The Oceans Act,* is the appropriate agency to take the lead, and indeed, has undertaken similar work in the Eastern Scotian Shelf Integrated Management initiative. The Proponent indicated its willingness to participate in such an initiative.

Recommendation 5.10
The Commissioner recommends that the Board, following up from its cumulative impacts workshop, pursue the issue of a regional monitoring program with the Department of Fisheries and Oceans. The regional monitoring program should incorporate public input and the results should be made available to the public.

5.2.3 Operational Discharges

The nature and extent of the various discharges from the drilling and production program received considerable attention from several Participants. With the exception of a major accident in which a large spill could occur, the Proponent has identified a number of planned discharges which have been generally characterized as small in relation to the receiving environment, and low to nil in terms of their effect. Several Participants challenged these assertions.

There are two major sources of planned discharges into the ocean during the White Rose project that were of concern to Participants. During drilling activities, drill cuttings will be removed from drilling muds, treated and discharged. During production, produced water – water from the producing formation that comes to the surface with oil and gas – will be treated and discharged.

Disposal of Drill Cuttings

The Proponent proposes to discharge drill cuttings into the ocean after they have been treated. The Offshore Waste Treatment Guidelines limit the amount of retained fluid on the cuttings to 15g of fluid/100g cuttings dry weight. However, the Guidelines are currently under review and the Proponent has indicated that it will comply with the new Guidelines. The Proponent estimates that 17,000 barrels of fluid will be discharged over the course of the drilling program. A number of Participants expressed concern that there are no regulatory limits to the total amount of fluid that can be discharged.

The Proponent also indicated that synthetic based muds attached to the cuttings have proven to be very low in toxicity, and their main effect is with respect to habitat alteration as this material settles on the seabed near the production platform. Nevertheless, concerns were also expressed regarding taint in fish and the smothering of benthic organisms near the drill centers. The Proponent's Development Application documents note that some environmental effects are likely, but that the magnitude, extent and duration of the effects mean that they are of low significance. The Proponent also prepared a detailed analysis of the technical, financial and environmental risks of cuttings disposal options which concluded that while cuttings re-injection and certain onshore disposal options were technically feasible, only ocean disposal was technically and economically feasible.

Recommendation 5.11
The Commissioner recommends that should the Board approve the ocean disposal of drill cuttings, it should do so on conditions requiring that the lowest practical levels of residual (drilling and formation) fluids be obtained; that a complete record of release quantities and contaminant constituents be kept; that results of annual monitoring programs be released publicly and treatment technology be reviewed annually and implemented where it can contribute to a continuous improvement approach to the control of pollutants.

Disposal of Produced Water

Produced water can contain suspended and dissolved oil. The current Offshore Waste Treatment Guidelines require suspended oil content to be 40mg/l or less averaged over a 30-day period and discharged. Average oil concentrations in the discharge stream that exceed 80mg/l over any 48-hour period are considered to have exceeded normal operating practice and will be reported to the Chief Conservation Officer within 24 hours.

Several Participants expressed concern with respect to the potentially toxic ingredients of produced water, and in particular with respect to the possibility of surface oil slicks. The Natural History Society felt that the guidelines permitted too high an oil content and suggested that even 15mg/l could cause a surface oil slick which is harmful to seabirds. It was noted that the shipping industry is required to reduce oil content in discharges to 15mg/l. Participants also expressed concern that the Guidelines were based on average oil content over a specified period of time. This is of particular concern since low

toxicity levels and environmental effects are dependent upon low concentrations and rapid dispersion of contaminants.

The Proponent responded by confirming that it will comply with the new Offshore Waste Treatment Guidelines. In response to suggestions that the regulations for oil projects are less stringent than for shipping operations, the Proponent explained that when dealing with large quantities of water as in an oil production installation, current technology cannot reduce the oil content to 15 mg/l. However, since the technology does exist to make it practical to approach 25 mg/l, the Proponent is comfortable that it can achieve the level required by the Guidelines. The Proponent said that the FPSO would be designed to allow for continuous monitoring.

The environmental impact prediction was hampered by the lack of any uncontaminated samples for analysis. As pointed out by the Proponent, "the formation water samples obtained during the 1999 – 2000 delineation program were contaminated with mud, so there is considerable uncertainty as to their composition". As a consequence, the Proponent has not been able to complete a study to determine the feasibility of re-injection of produced water. The concern is that the produced water, in combination with seawater, could develop characteristics which would affect reservoir integrity. Conversely, the absence of samples prevents any evaluation of contaminants present or their toxicity, although it is possible to make general comments on "typical" produced water, and on its dispersion characteristics.

The Proponent has indicated that, early in the production phase, samples will be available and it will then be possible to establish whether re-injection is economically and technically feasible. The Proponent has also committed that "the FPSO design will consider the incorporation of re-injection equipment to ensure the feasibility of implementing it, if re-injection proves to be economically and technically feasible".

As noted above, from a precautionary perspective, the Proponent should commit to achieve the lowest practical oil content, rather than affirming, as it did, its ability to operate within the regulations. Furthermore, since continuous monitoring technology will be available on the White Rose FPSO, the objective should be to achieve the lowest practical oil content on a continuous, rather than average, basis.

Recommendation 5.12
The Commissioner recommends that the Board delay its approval of the White Rose produced water treatment system until the Proponent is able to prepare and submit an analysis providing sufficient technical and economic detail to allow the Board to make a determination of the effect of discharge of produced water. The Commissioner further recommends that the Proponent be required to use best available proven technology to reduce the oil content to as low a level as practical if it is determined that produced water can be safely discharged into the ocean.

5.2.4 Effects on Seabirds

There are two main sources of environmental impacts on birds according to Participants who addressed this issue. They are attraction to lights and to the flare, and contact with oil sheens from small spills and possibly operational discharges.

In research referenced by William Montevecchi and Francis Wiese, it was reported that marine birds, attracted by lights and food, appear to concentrate near drilling platforms which can be a dangerous environment for them. The Canadian Nature Federation pointed out that the Proponent's Development Application acknowledges that seabirds can be harmed or killed by flying into structures on the platform or into the gas flare. In discussing the effect of flaring, including the low level of continuous flaring, the Natural History Society wrote that with respect to the effect on marine birds, "the Proponent expresses a low level of confidence in the prediction of a non-significant residual effect, a high probability of the predicted effects occurring and a low degree of scientific certainty. In other words, they are guessing".

The other source of concern for Participants was the chronic, small oil slicks that, they submitted, took place at a production facility. The Natural History Society was also concerned that the disposal of produced water could form an oil sheen since produced water will likely be similar in density, but warmer than the receiving water, and hence the discharge will have a tendency to float. The Proponent believes that harm to seabirds from the discharge of produced water will be minimal since sheens will occur rarely and would be quickly broken up by wave action.

A constant theme during the public sessions was the insufficient level of monitoring to determine the impact on seabirds of offshore operations. The lights on the FPSO and flaring of gas are known to attract some bird species, and a concern was expressed that the effect of this phenomenon on population levels is a significant unknown. The Canadian Nature Federation pointed out that "while both the Hibernia and Terra Nova Environmental Assessment processes identified marine birds as being the ecosystem component most at risk from offshore oil and gas development, it is clearly difficult to assess their potential impact without a sound understanding of bird distributions in the area."

The Natural History Society submission points out that, except for a journalist's article, there has been no research into the phenomenon. The submission maintains that the lack of independent observers on production platforms is the reason why this state of ignorance persists, and strongly criticizes both the C-NOPB and the industry in this regard. In its Comprehensive Study, the Proponent notes that a supply vessel based seabird monitoring program was carried out in 1999 and 2000, and commits to "continue to review this program throughout the development phase of the project and, based on the program results, will make a decision to continue the monitoring program during the operation phase".

There appears to be an emerging realization on the part of the offshore oil industry that their activities do have the potential to produce important but poorly understood effects on important ecosystem components such as marine birds. There also appears to be a reluctance to commit to major, long term research programs, especially where it is arguably a government responsibility. It would seem appropriate that government take responsibility for broad based research associated with improving the understanding of population dynamics, and of cumulative effects (as discussed above). It would also seem appropriate that the industry take responsibility for addressing specific issues of interactions and effects from their specific operations.

Recommendation 5.13
The Commissioner recommends that the Board require the Proponent to conduct a program of research to establish the effects from its operations on marine birds in general, and specifically with respect to flares/lights, operational discharges and oil spills.

5.2.5 Fish and the Fishery

The Grand Bank of Newfoundland has supported a sustained fishery for centuries, first by the fleets of distant water nations and later by a large domestic fishing industry. In fact, from the 16th to the 20th century the Grand Bank supplied much of Europe with cod, making the island's fishery "richer than all the gold mines of Peru." Besides its obvious historical and cultural significance, the Newfoundland fishery continues to be the primary engine of the provincial economy and is the single largest employer in the province today. As a result, the Commissioner received a number of detailed submissions on the potential effects of the White Rose Project on fish and the fishery as well as recommendations for the appropriate manner of responding to these issues.

Fish and Fisheries were treated as two separate VECs in the Proponent's Comprehensive Study and effects and related mitigation measures are indicated in the Comprehensive Study Report. Most of the discussion regarding fisheries issues during the public sessions focused on seismic operations, loss of access to fishing grounds, potential for tainting, potential for Newfoundland fishing grounds to lose their reputation as pristine and pollution free, and in particular, the need for a fisheries liaison with the oil industry.

The Natural History Society and industry presenters expressed concern that seismic surveys may have a detrimental effect on fish, fish habitat and fishing. FANL expressed concern that seismic surveys may have an effect on recruitment levels for ground fish stocks that are still at low population levels, and that continuing seismic surveys could permanently disrupt the migration patterns of fish stocks. A reference provided by FANL indicated that haddock and cod distribution and catches in the Barents Sea were affected by seismic survey activity, and that these effects lasted at least five days. The Proponent contended that any reported effects of seismic activity are localized and short term and that seismic surveys lie outside the scope of their Development Application.

The Commissioner observes that the potential effects of seismic exploration on fish recruitment and migration are poorly understood at present. Applying a precautionary approach, it is evident that this issue should be considered and examined through appropriate research studies. The Commissioner notes also that the precautionary principle is specifically addressed in the preamble to the federal Oceans Act, and that the Department of Fisheries and Oceans has the authority to determine the scope of the problem, and to conduct the research necessary. Both the fishing industry and the oil and gas industry have an interest in the outcome of such research.

Presentations to the Commissioner suggested that there was considerable skepticism regarding the Proponent's assessment that the environmental and operational effects of the Project on the fishery was minimal. Other issues of concern included the loss of fishing grounds and the risk of direct damage from accidental events and consequential damage from tainting and contamination.

FANL and the FFAW noted that even the perception of tainting of fish from the region of the Jean d'Arc Basin would threaten market acceptance of their product. The need for monitoring of important species was highlighted to identify changes to their sensitive environment. The Proponent provided an extensive discussion on the topic, pointing out the issues associated with taint and its detection and made a commitment to conduct taint testing of snow crab. The Commissioner agrees that this is a necessary and important initiative.

The Commissioner also agrees that damage to the reputation of seafood harvested from the Newfoundland offshore would have severe economic consequences. These conclusions serve to highlight the need for a comprehensive compensation program to be negotiated between the fishing industry and the oil and gas industry.

At a higher level, the fishing industry's primary concern was that it presently lacks the capability to participate in an informed manner in the myriad of issues raised by offshore oil development. Both FANL and FFAW therefore contended that because of the fishing industry's historic presence in the Newfoundland offshore area and the renewable nature of its resources, the oil industry should provide funding to allow them to hire a liaison officer to provide advice on the implications of offshore development for the fishing industry.

The reality is that the Newfoundland offshore will be accommodating natural resource exploitation by these two industries for the foreseeable future. The Commissioner accepts that the fishery is a long established and vital industry, and that it is the arrival of the oil industry that has altered the status quo in the offshore area. The Commissioner also accepts that the fishing industry will stand literally in harm's way in the event of an accidental event, and that its concerns are legitimate and must be addressed in an informed manner. The Commissioner therefore believes that a fisheries/petroleum industry liaison officer would help facilitate the two industries in working towards such important initiatives as reducing environmental and operational impacts, cooperating on

safety, search and rescue and emergency response efforts and developing a comprehensive compensation program.

The appropriate approach in the Commissioner's view is for the oil industry to fund the fisheries/petroleum industry liaison officer, which should represent both the fishing industry and the fisheries union in a collaborative way. The Commissioner feels that it is fair and reasonable that funds for the proposal be provided by the oil and gas companies in the Newfoundland offshore, probably on a pro rata basis, for an initial period of say three years. Following that period, oil industry funding could be phased out over a similar period and thereafter the position could be fully funded by the fishing industry.

Recommendation 5.14
The Commissioner recommends that the Board require the oil and gas industry to provide funding for FANL and FFAW to jointly hire a fisheries/petroleum industry liaison officer to advise them on offshore oil and gas issues related to the fishery and to assist both industries in cooperatively pursuing their respective activities.

5.2.6 Monitoring and Compliance

Almost all Participants who commented on environmental issues called for the placement of independent observers on board the FPSO. The Natural History Society as well as William Montevecchi and Francis Wiese focused on the need to have observers on production facilities and supply ships to conduct a comprehensive monitoring program for both seabirds and oil spills. Both groups, as well as the Canadian Nature Federation, felt that independent monitors would be the most appropriate way to proceed. FANL and the FFAW also believe that independent observers should be placed on all production facilities. Many presenters drew a parallel with the fishing industry where observers are routinely placed on fishing vessels.

The Proponent's response to requests for independent monitors was that it was impractical from a financial and logistical point of view, that there were issues of logistics, space and training, that there was insufficient work for a dedicated monitor, and finally, that it was unnecessary given the Proponent's commitment to environmental stewardship.

The Proponent's final argument against independent observers was that it is unnecessary and demonstrates a lack of trust in the oil industry to monitor itself. The Proponent appeared to view calls for a monitor to be insulting and an affront to its professional integrity. Without casting doubt on the Proponent's commitment to environmental stewardship, the Commissioner notes that in all industries, errors of judgment, pressures to perform and other issues have at times resulted in sacrificing environmental protection and even health and safety, often unknowingly. The Proponent's suggestion that a requirement for independent observers calls into question its integrity is, in the Commissioner's opinion, not valid.

In considering the format of a program for independent monitors, the Commissioner has considered Dr. Montevecchi and Francis Wiese's call for third party monitors, which suggested that affiliation with accredited institutions is necessary to ensure independence. Similarly, the Natural History Society has argued for a "truly independent" environmental effects monitoring program. The Commissioner believes that, provided there is public/stakeholder participation in the design of study programs, there is no reason to believe that the work could not be carried out in a scientifically valid and objective manner by the C-NOPB. Such an approach would be in keeping with its role as regulator and as the lead responsible authority for the White Rose environmental assessment.

The Commissioner concludes that there is certain to be adequate accommodation space and financial resources available for an independent observer to be placed on the FPSO. In addition to enabling a much more comprehensive monitoring program for seabirds and related matters, the presence of an observer would enhance the C-NOPB's role as regulator, would provide the Proponent with the opportunity to demonstrate sound environmental stewardship and transparency, and would give increased confidence in monitoring to many Participants. Furthermore, an on-site C-NOPB presence could be responsible for such actions as spot readings from pollution control equipment, checks for points of release for oil and related pollutant discharges, observation for evidence of surface slicks, third party audits of environmental management procedures and seabird observations and monitoring. It would also provide the C-NOPB with additional experience in the area of EEM design/interpretation, as well as environment, health and safety issues.

In summary, the Commissioner concludes that it is important to place an observer on the offshore production facilities to at least address the concerns raised and the perceptions some have that "things are happening out there of which we know nothing." The Commissioner also believes that there are sufficient important and productive duties that such an observer could undertake, as outlined above, and these would benefit the Proponent, the Board and the public generally. However, it is also reasonable to initiate such a new program on a trial basis and to evaluate it after a pre-determined time period.

Recommendation 5.15
The Commissioner recommends that the Board place a qualified observer on the White Rose FPSO and on other production facilities on the Grand Banks to monitor project interactions with the environment and to audit environmental management procedures.

6 CONCLUSIONS AND RECOMMENDATIONS

Chapter 3: GENERAL DEVELOPMENT APPROACH

Concept Selection

With respect to this project, it is the Commissioner's conclusion that, while the concept selection study was flawed in its analysis of the GBS option and limited in that it did not include benefits considerations, the FPSO option is the most cost effective for the White Rose project as currently configured.

The FPSO is a maturing technology, still with no actual experience in our environment, and developments in the technology and its performance need to be monitored closely by the C-NOPB. Some legitimate environment and safety concerns have been identified. These are dealt with in Chapter 5.

Further, the Proponent has stated that its proposed design of the FPSO can accommodate planned deferred oil developments. With modifications, the facility can also export a certain amount of gas when gas transportation facilities are available. This aspect is discussed in more detail in the next section of this chapter. Finally, the Proponent could have avoided a lot of consternation had it conducted and provided a fair comparison between the FPSO and GBS options in terms of Canada/Newfoundland benefits. Nevertheless, construction and operation of the FPSO based production system can provide significant Canadian and Newfoundland benefits, if this matter is tackled in the manner recommended in Chapter 4.

Several presenters had so little confidence in the technical and cost data presented by the Proponent on the FPSO and GBS modes of development that they called for an independent engineering review and recommended that the project be delayed until the results of that review are known. While the Commissioner, for reasons mentioned earlier, does not feel delaying the project for this reason is justified, he does feel it is essential that the matter be addressed by all stakeholders so that this is not an issue in future Development Application reviews. An obvious way to do this is to construct a different time frame and forum in which to address all aspects of the FPSO versus GBS question for potential offshore Newfoundland projects and to reach consensus on the likely utilization of each in the foreseeable future. A properly planned and scheduled high quality engineering and technical conference would seem appropriate. The initiative and the responsibility for organizing and conducting such a conference would be normally undertaken by government, but to be successful the full support and participation of the other stakeholders (C-NOPB, oil and gas producers, supply/service and construction/fabrication industry, organized labor, pipeline companies, and the general public) is essential. Further, once the outcome of such a transparent and thorough review is known, the logical follow-up would be preparation and adoption of a plan for the industry of the future.

Recommendation 3.1
The Commissioner recommends that, subject to related recommendations on safety (5.2, 5.3, 5.4, 5.5 and 5.6), the Proponent's preferred production system concept of a Floating Production Storage and Offloading system (FPSO) and subsea completion system with flowlines and risers connected to a quick disconnect turret be approved by the Board for the White Rose Development.

Recommendation 3.2
The Commissioner recommends that the Board consider the FPSO not as a mature technology, but as a maturing one, and furthermore that the FPSOs at Terra Nova and White Rose be closely monitored in relation to research on this technology ongoing elsewhere in the world and with particular focus on the aspects unique to our environment.

Deferred Development

It is clear to the Commissioner that the Proponent has concluded it has an economic project in the development of the South Pool oil reserves and that there are good opportunities to access additional oil, with the attendant economic benefits. They include development of the oil resources of the North and West Pools and eventually oil in the Eastern Shoals and the Hibernia formation. Some or all of these opportunities are very likely to be realized. The proposed FPSO and related systems are designed with the flexibility to handle these additional quantities of oil and thereby increase the utilization of the FPSO and extend the overall life of the White Rose field. In time, new technology can be expected to improve recovery factors and enhance these prospects further.

There are also substantial gas resources but no current plans for their development or even to undertake further delineation. Without additional information obtained in a timely manner, the true extent of the resources and the likelihood of their exploitation by the White Rose facilities will remain unknown. Furthermore, there is a significant difference between the Proponent's estimate of the gas resources expected in the reservoir (1.8 tcf) and the Board's (2.7 tcf). It is the Proponent's position that White Rose gas resources, although the largest gas discovery on the Grand Banks to date, are not sufficient to justify a gas pipeline and a gas development project, but they can certainly assist such a development.

It seems that the only way that White Rose gas can be developed is if there is a basin wide approach sufficient to justify the gas transportation infrastructure. It is the Commissioner's conclusion that the White Rose SDA is in the best position to be the catalyst for such a development, and can really only take on that role with early additional delineation work. That delineation work can also provide the additional information necessary to determine whether the White Rose facilities can exploit those resources and to resolve the significant difference between the Proponent's interpretation of the available data and that of the Board.

In the meantime, the Proponent has made the commitment that the FPSO will be designed so that with modifications it can be used to export gas when gas transportation infrastructure is available. Should that occur, the Proponent has committed to make the gas available. In evaluating what these 'commitments' mean, it is the Commissioner's conclusion that the event is unlikely to occur without regulatory intervention at the approval stage. In a future operating situation, where the FPSO is producing oil at full capacity and everything is going well, it will not be an easy decision for the operator to break off production for a minimum of three months, with all of the resulting costs and disruptions in operations not to mention the foregone opportunities of lost or delayed production for that period, and bring the vessel to shore for a $75 million modification, the purpose of which will be to allow the export of a relatively small amount of gas at what probably will be marginal returns.

Thus, if there is to be any serious thought of White Rose gas development in the foreseeable future, the Proponent should be required to undertake early gas delineation work and to pre-invest in gas export capacity on the FPSO. As well, the leadership initiatives of the Proponent, in coordinating cooperation between the various producers in the basin with a view to an area wide approach, must continue.

Recommendation 3.3
The Commissioner recommends that the Board approve the Proponent's deferred development plan for the oil resources of the White Rose Significant Discovery Area as presented during the public sessions and outlined in this chapter, provided that the Proponent is held to commitments made at the public review that there will be sufficient flexibility in the subsea system and turret to accommodate the plan; and, provided that the White Rose oil development will not interfere with, or impede in any way, future gas development.

Recommendation 3.4
The Commissioner recommends that the Board require the Proponent to provide for the eventual production of gas for export in its design of the FPSO topsides and facilities.

Recommendation 3.5
The Commissioner recommends that the Board require the Proponent to submit for the Board's approval a specific gas delineation program for the White Rose Significant Discovery Area, commencing with at least one delineation well within 6 months of project approval.

Recommendation 3.6
The Commissioner recommends that prior to the actual start of oil production (currently estimated for 2004) the Board review the information obtained from the recommended gas delineation program, and determine whether it would be appropriate to require the Proponent to undertake, at that time, the modifications required to the FPSO to enable it to export gas.

Recommendation 3.7
The Commissioner recommends that the Board require the Proponent to make White Rose gas available for export should gas transportation infrastructure be put in place.

Project Economics

In summary, the resulting base case rate of return indicates that White Rose is an attractive project with a rate of return of 18% rising to nearly 19% if one includes the Proponent's estimate of potential deferred development. With less conservative but still realistic assumptions the rate of return could increase to a range of 20 – 26%. Furthermore, some of the capital invested in this Project could also be used in the development of the gas resources in the SDA that would provide an additional return on the invested capital.

The C-NOPB and/or governments can use estimates and assumptions with which they are comfortable. It is, however, critical that this analysis be undertaken. The economics of any project influence project design and require a regulator to consider economic considerations in tandem with resource management issues. It is normal for the Proponent to protect against downside risk in its forecasting, but in seeking to determine if the Proponent's plans are sufficient to satisfy the provisions of the Atlantic Accord and other relevant legislation, the Board should look at the economics of the Project on its own merits and in a realistic manner and make decisions accordingly.

The Commissioner believes that the Proponent's estimates are conservative and that economics of the White Rose project are not 'marginal'. This is a medium size project with good rate of return and considerable up-side from any one of increased production, higher market price or lower than forecast exchange rates. The economics are such that it allows flexibility, if desirable and appropriate, to pre-invest at certain levels for gas production, to undertake further delineation wells, to execute pro-active programs in the important area of benefits, particularly for research and development, education and training, and supplier development.

Recommendation 3.8
The Commissioner recommends that when considering the Proponent's legitimate responsibilities under the Atlantic Accord and the relevant legislation, particularly its responsibilities relating to Canada/Newfoundland benefits, the Board not be influenced by the Proponent's suggestions that the project is 'marginal'. The Commissioner has concluded that this is a project with a good rate of return and considerable upside potential.

Recommendation 3.9
The Commissioner recommends that a complete project economic analysis be a required part of the Board's evaluation of future Development Applications.

Contracting Strategy

The difficulties with the Proponent's contracting strategy from the perspective of the public review and the eventual approval process are obvious. In terms of optics, the current status of bidding and contract awards has created the impression that the process is a fait accompli, and that most of the major contracting decisions have been made before the Commissioner's report is released. In such an atmosphere, any recommendation of the Commissioner or eventual decision of the C-NOPB that requires a modification of the Proponent's contracting approach will, by definition, lead to charges of delays and additional costs on a project that is portrayed by the Proponent as 'marginal'. The contracting strategy and schedule does not allow for consideration and implementation of the Commissioner's recommendations should they be accepted by the C-NOPB.

Recommendation 3.10
The Commissioner recommends that the Board not allow the Proponent's current contracting approach and schedule to influence the Board's decision-making in any way, whether regarding the selection of a particular production system, related contracts, or regarding the provision of Canada-Newfoundland Benefits.

Recommendation 3.11
The Commissioner recommends that all risks of delay or additional costs as a result of the contracting strategy employed by the Proponent be borne by the Proponent.

Chapter 4: BENEFITS AND THE CANADA-NEWFOUNDLAND BENEFITS PLAN

Throughout this public review process the Commissioner has identified a substantial number of concerns and problems regarding the current approach to Canada-Newfoundland benefits. These concerns and problems have been raised in presentations to the Commissioner and identified through the Commissioner's own research and analysis. Results delivered by the current benefits approach are considered less than satisfactory by most.

Should the benefits actually achieved during the project stage of both Hibernia and Terra Nova have been better or are we doing okay? This is the question that is often asked and answered quite differently in different circles. One part of the problem is that information is not readily available publicly as to what benefits were expected at the beginning of these two projects. Without knowing what the specific goals and objectives were, how can we measure performance? Another part of the problem is that there are conflicting interpretations of the benefits provisions of the Atlantic Accord and the supporting legislation. These range from the very general to the very specific.

For example, with respect to goods and services, some contend that if the work can be done here, or if the goods or services can be supplied from here, then that is what should

happen, irrespective of cost and productivity considerations. Those holding that view are in the minority and no one seriously maintained that position in the public sessions. Others, including many in the oil and gas industry, contend that the only work that should be done locally is that which results from winning a bid through an international bidding process, which in effect means that, if the local firm has the best bid, it will not be discriminated against.

Both are extreme positions. Both are inaccurate. Neither can they be substantiated on any reasonable reading of the Atlantic Accord and the Accord Acts or maintained through an objective attempt to understand the spirit and intent of the Accord and its true importance. So, there must be a middle ground and a better way to do business. Those who made formal presentations to the Commissioner on this subject, without exception, took this approach and balanced their concerns with well-reasoned suggestions for changed procedures and improved results.

People want the White Rose project to go ahead under the right conditions. However, they are frustrated with the level of benefits being realized, in relation to the potential, and by the lack of a clear and acceptable interpretation of the provisions of the Atlantic Accord and the Accord Acts. They feel the spirit and intent of the Atlantic Accord has been gradually eroding.

A few recent, and what some would say relatively minor, observations give additional insight into where Canada-Newfoundland benefits considerations may fall in the everyday thinking and activities of some in the oil and gas industry. In July 2001, the Hebron Asset Team, lead by Chevron Canada Resources, announced that it had recently awarded three Hebron pre-development studies, the Turret study, the Subsea Systems study and the Topsides study. All three were awarded to firms based in Houston, Texas. There was no mention of Canada-Newfoundland benefit considerations in the release. On August 8th, 2001 Petro-Canada advertised for Expressions of Interest (EOI) for the provision of equipment and services for two exploration wells in the Flemish Pass Basin Offshore Newfoundland. There was no reference or mention of Canada-Newfoundland benefits considerations. In the Saturday, September 15th, 2001 *The Telegram*, Husky Energy advertised for a Senior Staff Drilling Engineer to be located in St. John's. There was no mention of first consideration to qualified candidates of the Province, as there was in a Petro-Canada advertisement of the same date.

It appears to the Commissioner that, in a general sense, many of these detailed concerns are really symptomatic of structural and administrative problems with the current benefits system and that no one, including the public, the supply and service industry organizations, trade unions, municipalities, proponents or the regulator are particularly satisfied with the current circumstance. Changes in procedure and approach are required for White Rose, for future projects, and for the industry generally

Proponent's Canada-Newfoundland Benefits Plan

There are major issues to be addressed in this aspect of the White Rose Development Application.

The provision of industrial and employment benefits, and other benefits such as in the area of research and development expenditures in the Province, in accordance with the economic growth objectives of both Governments, is an important aspect of the Atlantic Accord and its Implementation Acts. The Canada-Newfoundland Benefits Plan is the principal tool for delivery of these benefits, and an *approved* Plan is a pre-requisite or pre-condition to the approval of any Development Plan or work activity.

The Canada-Newfoundland Benefits Plan for White Rose is so general and qualified that it effectively leaves complete discretion on benefits matters with the Proponent and its contractors. It is impossible to get from the Plan itself a firm idea of what if any benefits will result from its implementation. Despite all the generally worded commitments and procedures in the Plan in favor of local benefits, it is conceivable and possible, that a fully completed FPSO, for example, with all its systems, could someday arrive at the White Rose site on the Grand Banks and start production with absolutely no Canada-Newfoundland direct labor or materials and equipment in the construction. There is nothing in the Benefits Plan to prevent this.

There are no firm or quantifiable goals or objectives for employment or for goods and services to which the Proponent can strive towards and against which its performance is to be measured. There are no meaningful lists of specific pro-active measures the Proponent is undertaking to ensure that the objectives will be met. There are no specific quantifiable commitments or expenditure estimates in the important education and training and research and development provisions.

Finally, the goods and services provisions are significantly qualified by clauses such as best value, internationally competitive, essentially equal, etc. There is no inclusion of local content or benefits considerations in the actual evaluation criteria for the selection of successful bidders. It is true that if the local or Canadian bidder has the best bid he/she will get the contract. In other words, local bidders will not be discriminated against.

None of these conclusions were even disputed by the Proponent.

For these reasons and others articulated previously in this chapter, the Plan is inadequate as written and cannot be recommended for approval. This is not to say that the Proponent has not demonstrated by its actions that in many respects it is sincerely trying to deliver substantial benefits. It is, and those actions of the Proponent are commended. It is not to say that the Proponent's attention to matters such as productivity, cost, delivery, technical considerations, etc. and concerns for protecting its decision-making autonomy and the viability of the project are not important. They are, and they have to be taken into account. But they have to be taken into account against the backdrop of the formal requirement and obligation of the Proponent to put forward a Benefits Plan that optimizes the employment and industrial benefits flowing to Newfoundland and to Canada. It is the contents of that Plan that will guide the individual decisions of the multitude of

contractors and subcontractors in the very complex web of the procurement process. It is the contents of that Plan on which the Proponent has to be judged.

Secondly, while the Proponent's positive actions and drive to "get on with the project" is seen by some to be commendable, its contracting strategy and very aggressive time frame create severe problems from a benefits viewpoint. While the Proponent has stated it is proceeding "at its own risk", there is no approved Benefits Plan against which to monitor the contracting procedures to date and consequently (or at least this is the understanding of the Commissioner) benefits monitoring has not been done by the C-NOPB. For the past several months the Proponent has been engaged in a pro-active campaign in an attempt to find what it calls "a made in Canada/Newfoundland solution" for the fabrication and assembly of topsides modules.

The Proponent is optimistic that such a solution will be found. There will even be expressions of relief in some circles if that is the case. However, this is only one of several major areas of contract activity, and there are many other areas that could benefit from their own set of pro-active efforts, for example, parts of the turret construction, or parts of the subsea system, or supply of materials and equipment to Samsung, if these contracts were to be subjected to them.

Further, the Proponent has stated that its intention is to fix, in a tentative fashion, the major contracts upon completion of the public review process. When that happens, the contractor and subcontractor supply trains are set already and can be influenced only minimally afterwards. In particular, the Proponent's stated approach would basically prevent any new approaches and efforts that might be recommended by the Commissioner and approved by the C-NOPB from being implemented in time to positively influence the achievement of increased levels of Canada-Newfoundland benefits in the important materials and equipment supply aspect of the White Rose project execution phase.

Recommendation 4.1
The Commissioner recommends that the Board not approve the Canada-Newfoundland Benefits Plan, Volume I of the White Rose Development Application, for the reasons outlined in this chapter.

Recommendation 4.2
The Commissioner recommends that the Board invite the Proponent to re-write its Benefits Plan to correct the deficiencies identified by the Commissioner and to reflect the improvement suggestions outlined below. The Commissioner envisages that this can be done in consultation with the Board and the revised Benefits Plan can be resubmitted to the Board in a matter of a few weeks, without necessarily disrupting the Board's stated approval decision schedule for this fall. For ease of reference, the improvement suggestions include:

- **Provide, as an integral part of the Benefits Plan, realistic estimates, in terms of specific levels and quantifiable objectives, of what benefits the**

Proponent expects will be achieved through implementation of the Benefits Plan. These *quantifiable objectives* or *targets* should be expressed in terms such as dollar amount of goods and services procured, percentage of total dollars spent, percentage of construction contracts awarded, person-years of employment and/or similar quantifiable units. These targets represent thresholds to be strived for and subsequently are to be used as benchmarks against which progress can be measured.

- **Provide, as an integral part of the Benefits Plan, *tools* in the form of firm pro-active programs or initiatives that will be utilized by the Proponent and its contractors and subcontractors as they strive together to meet the stated quantifiable objectives or targets. There should be a list of these *tools* for each major category of benefits, namely: employment; education, training and technology transfer; goods and services; and research and development.**

- **Provide, specific initiatives to promote training, recruitment, retention and promotion of women for the White Rose Project and amend the Benefits Plan to reflect the commitment to "defined objectives, quantifiable targets, and measurable outcomes" contained in the Proponent's June 8th Additional Information document.**

- **Re-address the procurement and bid evaluation procedures for goods and services, and in particular, the Proponent's qualifiers 'internationally competitive', 'best value', 'essentially equal'. Local content must be included as one of the selection criteria in the definition of 'best value'.**

- **Formally require all contractors and subcontractors operate as if they were the Proponent with all of its responsibilities and obligations under the Benefits Plan, and remove such catch-all escape clauses as require contractors "to comply to a *reasonable* degree", "major contractors will be *encouraged* to conduct a thorough assessment of… local facilities", etc.**

- **Provide specific research and development programs and expenditure commitments in line with a goal of creating the proper longer-term economic environment and business community appropriate to a "major oil and gas producer" or of developing a sustainable oil and gas industry.**

- **Update Chapters 5 and 6 of the Proponent's Benefits Plan with current information. For example, as mentioned earlier, Table 6.10-1 shows total direct labor requirements at approximately 12.2 million person-hours. Information presented in the June 8th response to the Commissioner provided tables totaling 21.9 million person-hours. These were subsequently corrected in Tables 4.1 and 4.2 shown in this chapter which total 19.3 million person-hours. It is most likely that Table 5.12-1,**

Consumables Requirements Summary and Table 5.12-2, Contracted Services Requirements Summary need similar updates.

- **Correct a variety of inconsistencies, such as the various references in the Plan to the fact that Canada-Newfoundland benefit considerations are part of the bid selection criteria whereas they are definitely not included in the best value definition; section 2.3.4 of the Plan ignores the Accord principle recognizing the right of Newfoundland and Labrador to be *the* principal beneficiary. The Company's position was corrected at the public sessions and this should be reflected in the Plan.**

Recommendation 4.3
The Commissioner recommends that the Board require the Proponent to reflect the results of its new pro-active programs in its quantifiable objectives or targets for the project and that, concurrent with the re-writing of the Benefits Plan, the Proponent and its contractors engage in an intensive effort to maximize the Canada/Newfoundland content in all major contract areas in the project phase in accordance with the provisions to be included in the new Plan.

Recommendation 4.4
The Commissioner recommends that the Board evaluate and make a decision on the Proponent's revised and re-submitted Canada-Newfoundland Benefits Plan prior to making a decision on the Development Plan.

Additional Measures for the C-NOBP

In addition to requiring an improved Benefits Plan, the Commissioner feels the Board needs to play a pro-active role in benefits administration and it needs to do so early in the process. The Commissioner believes such a responsibility is contemplated in the Accord and the Accord Acts (see section 4.3). It is also necessary from a practical perspective. The full effectiveness of the recommended improvements for the contents of a Benefits Plan (as above) can only be realized if they are complemented by a firm presence on the part of the C-NOPB. Take for example, the procurement by contract of goods and services. During the public review process the Proponent explained its reluctance to provide estimates of materials and equipment to be supplied locally until contracts are fixed. At the time, a statement was made to the effect that "once we know which contractors are chosen then we will know the level of benefits". At present, both the Proponent of a project and the Board spend considerable resources and effort in monitoring the contractor's performance during contract execution and in after-the-fact auditing. This is important, but it is not as important as pro-active efforts early in the process to ensure that Canada-Newfoundland benefits are maximized during the request for proposals and the bidding stage. In specific terms, the current approach strives to ensure a contractor actually meets his commitment of say 9% local content in his contract. The recommended approach strives to obtain what might be a significantly

higher level of local content commitment, say 18%, through pro-active efforts at the start of the bidding process, and thereafter looks to monitoring to measure performance.

The question of gender equity in the oil and gas industry is also important. The presentation of the Women in Resource Development Committee was directed primarily to the Board, which the Committee believes should play a pro-active role in establishing the requirements of a proper gender equity program, provide the consultation and communication mechanism, and establish the reporting and monitoring procedures. Further, the Committee recommends that, pursuant to Section 45 (4) of the Canada Newfoundland Atlantic Accord, the Board designate women as a disadvantaged group, using the Federal Employment Equity Act as a model. It is the Commissioner's view that the formidable barriers to equitable participation for women in the oil and gas industry need to be addressed. Further, the Commissioner believes the preferable approach to address this important issue is for the Proponent to provide specific initiatives in its Benefits Plan, as per Recommendation 4.2, and also for the Board to take a pro-active approach by outlining in new guidelines its key gender equity requirements and related reporting and monitoring procedures.

Finally, it is the Commissioner's belief that the Petroleum Producers want to be good corporate citizens, they want to help build the communities in which they operate, and they tend to co-operate and contribute fully if they know the rules of the game. With Hibernia in production, Terra Nova about to start, White Rose seeking regulatory approval, Hebron in the planning stages and on-going exploration programs, they need to know more clearly what is expected of them. Other stakeholders need to know this as well so their actions can be guided accordingly. Thus, it is the Commissioner's view that the C-NOPB should issue a definitive statement as to how it interprets the Accord and how it will implement or administer its responsibilities, including specifying more clearly its expectations in a model Benefits Plan.

Recommendation 4.5
The Commissioner recommends that the Board (after consideration of the Commissioner's interpretation of the Atlantic Accord and the Accord Acts, his advice on the Board's responsibilities in this area of Canada-Newfoundland benefits, and his advice on adoption of an improved system of benefits administration, as outlined in this Chapter 4) release publicly a definitive statement as to how the Board intends to interpret the Atlantic Accord and the Accord Acts and how the Board will implement or administer its benefits responsibilities, including requirements for, and evaluation of, the Benefits Plans.

Recommendation 4.6
The Commissioner recommends that the Board update Chapter 5 of its Development Application Guidelines entitled Canada-Newfoundland Benefits Plan, dated December 1988, so that these guidelines clearly specify these new Benefits Plan requirements and, in the appropriate level of detail, outline what is expected from Proponents.

Chapter 5: HUMAN SAFETY AND ENVIRONMENTAL PROTECTION

Regulatory Issues for Occupational Health and Safety

There was considerable discussion of safety issues and their regulation and enforcement during the public sessions. The Commissioner agrees that draft regulations originally developed 11 years ago must be updated and enacted. To effectively and pro-actively regulate the safety issues in such a technically sophisticated and demanding sector as offshore petroleum development, the Board must be given adequate resources. Appropriate reporting structures can also ensure that the Board is functioning as effectively as possible. In the spirit of continuous improvement and in light of the presentations during the public sessions, the Commissioner believes there are opportunities for improvement in the regulatory regime for offshore safety. However, the Commissioner has not had the benefit of hearing the views and perspectives of the Board and the relevant government departments on these issues to complement the views raised by the Participants. Nevertheless, these issues need to be addressed and the suggested solutions put forward at the public sessions need to be given serious consideration by those responsible.

Recommendation 5.1
The Commissioner recommends that the Board and governments take appropriate action in accordance with their responsibilities with reference to the occupational health and safety issues raised. The Commissioner further recommends that the Board, as the regulatory body, take the initiative. A forum which would include industry, labour, the relevant departments of government and others interested in safety to review these matters in depth is suggested. Results of the forum and follow up action should be reported publicly.

Operations Safety Issues

Recommendation 5.2
The Commissioner recommends that the Board require that an experienced Master Mariner be the person responsible for the vessel integrity aspects of the White Rose FPSO and for issues of marine safety. The Commissioner further recommends that the Master Mariner have the authority to order the commencement of the disconnection process, including shutting down processing equipment and flushing lines, and to decide if and when the FPSO actually disconnects.

Recommendation 5.3
The Commissioner recommends that the Board require that the FPSO disconnect operation, including the quick disconnect in a simulated emergency situation, be thoroughly tested during commissioning. The Commissioner further recommends that regular practice disconnects, including complete disconnects from the spider buoy, be held at a frequency as determined by the Board but sufficient to allow operators to be comfortable with the procedure.

Recommendation 5.4
The Commissioner recommends that the Board review the full results of all model testing on the proposed FPSO hull for White Rose and confirm that these results demonstrate its safety for the Grand Banks environment before approving the production system design. The Commissioner further recommends that on-going monitoring of the structural integrity of the vessel be required.

Recommendation 5.5
The Commissioner recommends that the Board require that the Proponent's operational safety planning, including its evacuation plans, consider the simultaneous occurrence of two or more extreme events, involving accidental events in combination with wind, sea and ice. The Commissioner further recommends that the ability of the FPSO to disconnect during heavy seas and high winds should also be assessed.

Recommendation 5.6
The Commissioner recommends that the Board require that the Proponent's Ice Management Plan explicitly affirm the principle of avoidance of collisions with icebergs and establish prudent criteria for the mass of an approaching iceberg that would initiate disconnect procedures and an identified process to determine whether icebergs meet these criteria.

Transparency

Recommendation 5.7
The Commissioner recommends that the Accord Acts be amended to allow the Board to disclose information in respect of which section 119 of the federal Accord Act and section 115 of the provincial Accord Act presently apply, where such disclosure is in the interest of public safety or the protection of the environment.

Environmental Assessment Methods

Recommendation 5.8
The Commissioner recommends that the Board take into account the concerns raised during the public sessions regarding the significance criteria and the resulting determination of significant effects in designing the follow-up program for the White Rose Project as required by the Canadian Environmental Assessment Act. The Commissioner further recommends that the Board seek to achieve continuous improvement in impact assessment methodology, including the determination of significance criteria, through development of stringent guidelines for Proponents.

Recommendation 5.9
The Commissioner recommends that the Board require that the Precautionary Principle be fully integrated into both the planning and the operational decision-making for the White Rose Project and that the Board specifically require the use of best available proven technology in all aspects of the Project, including with respect to minimizing the discharge of pollutants.

Recommendation 5.10
The Commissioner recommends that the Board, following up from its cumulative impacts workshop, pursue the issue of a regional monitoring program with the Department of Fisheries and Oceans. The regional monitoring program should incorporate public input and the results should be made available to the public.

Operational Discharges

Recommendation 5.11
The Commissioner recommends that should the Board approve the ocean disposal of drill cuttings, it should do so on conditions requiring that the lowest practical levels of residual (drilling and formation) fluids be obtained; that a complete record of release quantities and contaminant constituents be kept; that results of annual monitoring programs be released publicly and treatment technology be reviewed annually and implemented where it can contribute to a continuous improvement approach to the control of pollutants.

Recommendation 5.12
The Commissioner recommends that the Board delay its approval of the White Rose produced water treatment system until the Proponent is able to prepare and submit an analysis providing sufficient technical and economic detail to allow the Board to make a determination of the effect of discharge of produced water. The Commissioner further recommends that the Proponent be required to use best available proven technology to reduce the oil content to as low a level as practical if it is determined that produced water can be safely discharged into the ocean.

Effects on Seabirds

Recommendation 5.13
The Commissioner recommends that the Board require the Proponent to conduct a program of research to establish the effects from its operations on marine birds in general, and specifically with respect to flares/lights, operational discharges and oil spills.

Fish and the Fishery

Recommendation 5.14
The Commissioner recommends that the Board require the oil and gas industry to provide funding for FANL and FFAW to jointly hire a fisheries/petroleum industry liaison officer to advise them on offshore oil and gas issues related to the fishery and to assist both industries in cooperatively pursuing their respective activities.

Monitoring and Compliance

Recommendation 5.15
The Commissioner recommends that the Board place a qualified observer on the White Rose FPSO and on other production facilities on the Grand Banks to monitor project interactions with the environment and to audit environmental management procedures.

7 LIST OF APPENDICIES

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Appendix A
Biography of Commissioner and List of Commission Staff and Consultants

Herbert M. (Herb) Clarke was born at Norris Point in 1944. He holds a BA (Ed.) and B.Sc. (Honors Mathematics 1st Class) from Memorial University of Newfoundland (1965); certificates in Operations Research from the University of Michigan (1966), in Business Management from McGill University (1967), and in Advanced Computer Systems Training from the IBM Centre, NYC. He was awarded the Professional Manager (P.Mgr.) in 1981.

Mr. Clarke has substantial private and public sector experience at senior executive levels in areas of public policy, resource development policy and industry – government relationships.

After graduation he worked first as an ***operations research analyst*** with the Aluminum Company of Canada in Montreal and then as ***Director of Systems and Programming*** with Newfoundland and Labrador Computer Services in St. John's. He has served for 12 years as ***Deputy Minister*** in the Provincial Government in the Departments of Forestry and Agriculture, Economic Development and Tourism, and as ***Clerk of the Executive Council and Secretary to Cabinet***, the most senior public service position. In 1988, Mr. Clarke was appointed ***Executive Vice-President of Harvesting and Engineering***, Fisheries Products International. At FPI he was responsible for trawler operations in Newfoundland and in Riverport, Nova Scotia and for overseeing the engineering function related to plants, trawlers and port facilities, including FPI's new construction program at shipyards and the ongoing maintenance program at Burin Refit Centre. In January 1993, he was appointed by the Government of Canada as the founding ***Chairman of the Fisheries Resource Conservation Council (FRCC).*** The mandate of the FRCC is to hold public consultations, balance scientific and industry knowledge, and make formal and public recommendations to the Government of Canada on harvest levels, scientific research and other conservation measures required to rebuild a sustainable fishery in Canada's Atlantic and Eastern Arctic waters. From 1996 to early 2000, Mr. Clarke was ***Vice President, Corporate Affairs*** at Voisey's Bay Nickel Company, with primary responsibility for aboriginal affairs and for Impact and Benefit Agreements (IBA's).

Mr. Clarke has also served on numerous Boards of Directors, including Newfoundland and Labrador Computer Services, Marystown Shipyard Limited (Chairman), the Newfoundland and Labrador Development Corporation, Memorial University School of Business Advisory Board, the Board of Governors of the Centre for Cold Ocean Resource Engineering (C-Core), the Ocean Production Enhancement Network, the Canadian Centre for Fisheries Innovation, and the Newfoundland and Labrador Science Council. He is a member of the Rotary Club of St. John's.

Herb and his wife, Nora, have three children and reside in St. John's.

Public Review Commission Secretariat:

Geoff Pearcey, Manager

Christine Hancock, Administrative Assistant

Peter O'Flaherty, Goodland O'Flaherty, Barristers and Solicitors (Commission Counsel)

Public Review Consultants:

The following consultants assisted the Commissioner and staff with specific aspects of the public review process.

Bevin R. LeDrew, AMEC Earth and Environmental (Environmental Protection Section of the Commissioner's report)

John G. Fitzgerald, P. Eng. (Request for additional information stage)

Patricia R. Jackson (Communications planning; media relations during public sessions)

T.G. Whelan, P. Eng. (Review of benefits issues)

Richard G. DeWolf & G. Gordon Clarke, Ziff Energy Group (Review of certain development plan issues)

Patrick Martin, DRAY Inc. (Web site design and maintenance, cover design)

Appendix B
Commissioner's Terms of Reference

1. Definitions

In these Terms of Reference,

"Accord Acts" means the *Canada-Newfoundland Atlantic Accord Implementation Act* and the *Canada-Newfoundland Atlantic Accord Implementation Newfoundland Act*;

"Board" means The Canada-Newfoundland Offshore Petroleum Board;

"Canada-Newfoundland benefits plan" has the meaning set out in section 45 of the Accord Acts;

"Commissioner" means the individual appointed pursuant to para. 44(2)(b) of the Accord Acts;

"Development Application" means all documentation provided to the Board by the Proponent for the purpose of para. 44 2)(c) of the Accord Acts, to support approval of the Project and shall include but not be limited to, an environmental impact statement, a socio-economic impact statement, a development plan and a Canada-Newfoundland benefits plan;

"Development Application Guidelines" means the Development Application Guidelines dated 1988 as published by the Board and available at the Board's website (www.cnopb.nfnet.com) under "Publications";

"Development plan" has the meaning set out in section 2 of the Accord Acts;

"Participant" means a person other than the Proponent, who makes an oral presentation or files a written submission to the Commissioner pursuant to the Procedures for Public Review;

"Procedures for Public Review" means the procedures as may be implemented by the Commissioner;

"Project" means the proposed development of the White Rose oil field, as described at the Proponent's website (www.huskywhiterose.com) under "Project Description";

"Proponent" means Husky Oil Operations Limited;

"Secretariat" means the Commissioner's support staff obtained pursuant to Paragraph 13;

"White Rose Significant Discovery Area" means the area as referred to in para. 1.3 of the Proponent's "Project Description" (www.huskywhiterose.com).

2. General

Subject to the requirements of these Terms of Reference and the Accord Acts, the Commissioner will conduct a review of the Development Application which will include:

a) considerations of human safety and environmental protection incorporated into the proposed design and operation of the Project;

b) the general approach to the proposed and potential development and exploitation of the petroleum resources within the White Rose Significant Discovery Area; and

c) the resulting benefits that are expected to accrue to the Province of Newfoundland and Labrador and to Canada, having particular regard to the requirements for a Canada-Newfoundland benefits plan.

3. Scope of the Review

The Commissioner shall include in his review a consideration of the matters dealt with in chapters 4 through 9 of the Development Application Guidelines.

4. Limitation

The Commissioner's mandate shall not include an examination of questions of energy policy, jurisdiction, the fiscal or royalty regime of governments, the division of revenues between the Government of Canada and the Government of Newfoundland and Labrador, or matters which go beyond the potential or proposed development of the White Rose Significant Discovery Area.

5. Public Participation

The Commissioner shall conduct the public review sessions in a manner which shall promote and facilitate public participation.

6. Conduct of the Review

The Procedures for Public Review implemented by the Commissioner will be generally consistent with section 2.5 of the Development Application Guidelines.

7. Consultation by Commissioner with Board

The Commissioner, the Secretariat, or both may consult the Board for the purposes of clarifying any matters respecting these Terms of Reference or the review process for the Development Application. In no event shall the Commissioner or Secretariat consult the

Board for the purposes of discussing any substantive matters or merits respecting the Development Application or Project.

8. Referral of Documentation to Commissioner

Following the Board's determination that the documentation contained in the Development Application is complete for public review, the Board shall refer the documentation to the Commissioner for public review. As soon as practicable thereafter, the Commissioner shall issue a general notice to the public containing or attaching the following information:

a) the approximate dates during which the public sessions are expected to take place. (At least 90 days notice will be provided between the date of such notice and the commencement of public sessions);

b) the Terms of Reference and the Procedures for Public Review; and

c) relevant information respecting how interested parties may obtain a copy of the Development Application or further information.

9. Request for Additional Information

The following guidance is provided respecting any requirement to obtain information additional to the Development Application documentation filed under paragraph 8 above:

a) following the referral of the Development Application to the Commissioner, the Commissioner may request any further information from the Proponent which the Commissioner considers necessary for the conduct of the public review, including but not limited to:

i) information relevant to the Project;

ii) existing technical, environmental or other information relevant to the review;

iii) supplementary information including a description of any Proponent-initiated public consultation program, its nature and scope, issues identified, commitments made and outstanding issues; and

iv) any proposed work plans, terms of reference or guidelines relating to the Proponent's preparation of its Development Application;

Such additional information gathered for the above purposes will be referred to as "Supplementary Information";

b) The Commissioner shall ensure that subject to any disclosure restrictions under law, the information provided under the Development Application and the Supplementary Information is made available for public examination;

c) Following the general notice of public sessions referred to in paragraph 8, but prior to announcing a detailed schedule for public sessions under paragraph 11, the Commissioner will request public comment to determine whether additional information should be provided before convening the public sessions. The time period for receipt of comments shall not exceed thirty (30) days. In consideration of any comments which are received, the Commissioner may request additional information from the Proponent having particular regard for its relevance, material value and reasonableness. Any request for additional information shall be issued no later than fifteen (15) days following the expiry of the thirty (30) day period for comment referred to above;

d) Once the notice for public review sessions have been given and any Participant makes or files a submission pursuant to the Procedures for Public Review, the Commissioner may also request any additional information from any Participant, which in the Commissioner's opinion is relevant.

10. Location of Sessions

The Commissioner will hold the sessions in St. John's and in other locations as may be determined by the Commissioner.

11. Announcement and Completion of Sessions

The Commissioner will provide notice of the detailed schedule and announce specific dates and locations of the public review sessions respecting the Project once the Commissioner is satisfied with the information provided. This notice will be issued a minimum of thirty (30) days prior to the start of the sessions.

12. Reporting

The Commissioner will prepare and submit to the Board, to the federal Minister of Natural Resources and to the provincial Minister of Mines and Energy, having particular regard for the matters considered under the Development Application Guidelines, a report on its review of the Project, including:

a) comments which are received from the public; and

b) the Commissioner's recommendations.

The report shall be submitted at the earliest possible date but in no event later than one hundred and eighty (180) days following receipt of the information referred to in paragraph 8.

13. Support Staff for Commissioner

The Commissioner may obtain and as needed, request the services of support staff including independent specialists or professionals whose functions would be to provide

information on and help interpret information and issues relevant to the public review. The names of any such persons retained by the Commissioner will be made public. Specialists hired by the Commissioner may be requested to appear before the Commissioner. Other support services may also be obtained with respect to any logistical and administrative functions which need to be performed.

14. Powers of the Commissioner

The Commissioner shall be vested with the same powers conferred by the Government of Newfoundland and Labrador to any commissioner appointed pursuant to the *Public Inquiries Act*.

Appendix C
Operational Procedures

1. INTRODUCTION

1.0.1. This document outlines operational procedures to be followed in the public review of the White Rose Development Application. It includes the time frames for components of the review and guidelines for written and oral submissions and for the conduct of public review sessions.

1.0.2. The review is being conducted by an independent Commissioner appointed by the Board in accordance with the Accord Acts[1]. Subject to the requirements of the Terms of Reference and the Accord Acts, the review will include all relevant aspects of the proposed and potential development of the White Rose Significant Discovery Area, including:

- considerations of human safety and environmental protection incorporated into the proposed design and operation of the Project,
- the general approach to the proposed and potential development and exploitation of the petroleum resources within the White Rose Significant Discovery Area, and
- the resulting benefits that are expected to accrue to the Province of Newfoundland and Labrador and to Canada, having particular regard to the requirements for a Canada-Newfoundland benefits plan.

1.0.3. The objective of the public review is to provide opportunities for:

- individuals, organizations, and the general public to make known views and opinions, and to present information on the effects of the Project,
- the Proponent to explain the Project and respond to concerns and questions raised by Participants during the hearings,
- the Commissioner to receive information to assist him in reaching informed and objective conclusions with regard to the Project, which will form the basis for his recommendations.

1.0.4. A large number of Participants may wish to be present and be heard during the public review sessions. These procedures are intended to promote and facilitate public participation and to ensure that the review takes place in a fair and equitable manner, with maximum cooperation and courtesy. The Commissioner will maintain order and efficiency in a structured, but informal atmosphere. As the Commissioner's conclusions and recommendations will not have legal force but will be advisory, the review will not be governed by the strict rules of procedure and evidence required by a court. However,

[1] Definitions are provided in section 6 of these Procedures.

the Commissioner will conduct the review in a manner which will require accountability for statements made by the Proponent and Participants.

1.0.5. The Commissioner has the discretion to modify, add to or waive these procedures or any specific provision herein where there are reasons why the objectives of the public review can be better achieved by taking a different approach.

2. REVIEW PROCESS

2.0.1. The Board has now determined that the documentation contained in the Development Application is complete for public review and has referred it to the Commissioner.

2.0.2. There will be two opportunities for the public to make submissions to the Commissioner. The first opportunity addresses the issue of whether additional information should be requested by the Commissioner and provided by the Proponent prior to convening the public review sessions. The second opportunity allows individuals, organizations and the general public to make known views and opinions on the merits of the information and conclusions contained in the Development Application and to present information on the effects of the Project to the Commissioner during public review sessions.

2.0.3. During the public review sessions, the Proponent has the opportunity to present information on the Project and to discuss Project-related issues with individuals, organizations and the general public.

2.0.4. Information presented during the review will assist the Commissioner in reaching informed and objective conclusions with regard to the Project, which will form the basis for his recommendations. The Commissioner's report will be submitted to the Board, the federal Minister of Natural Resources, and the Minister of Mines and Energy for the Government of Newfoundland and Labrador.

3. ADDITIONAL INFORMATION REVIEW

3.0.1. Early in the process, the Commissioner will request public comment to determine whether additional information should be provided by the Proponent before convening the public review sessions. At this stage, submissions should not address the merits of the Project.

3.0.2. Anyone wishing to make a submission to the Commissioner regarding the requirement for additional information must do so within a time period to be set by the Commissioner, not to exceed thirty (30) days.

3.0.3. Submissions should be forwarded in hard copy and where possible, to facilitate dissemination of the documents on the Commission's website, in electronic format (as Acrobat, MS-Word or WordPerfect files) to the Commissioner's office.

3.0.4. All written submissions must include:

a) the name and address of the Participant;
b) the names of all individuals, groups, organizations, or entities on whose behalf the Participant is acting;
c) complete citations of all studies, articles, reports or other documents used in support of the Participant's submission.

3.0.5. The Commissioner will consider these submissions in determining whether to request additional information from the Proponent in accordance with section 9 of the Commissioner's Terms of Reference.

3.0.6. All written submissions received in accordance with this section will be reviewed by the Commissioner and reproduced and made available at the Commissioner's office and/or website (www.wrpublicreview.ca).

4. MERITS REVIEW

4.0.1. The review of the merits of the Project provides for written submissions and for oral presentations during public review sessions. This stage of the review will allow individuals, organizations and the general public to make known their views and opinions on the merits of the information and conclusions contained in the Development Application and to present information on the effects of the Project to the Commissioner during public review sessions.

4.1. Written Submissions – Guidelines for Participants

4.1.1. Anyone wishing to register a written submission with the Commissioner's office must do so by filing twenty (20) copies of the entire submission at least ten (10) days prior to the commencement of the public review session. Submissions should be provided in hard copy and, where possible, in electronic format (as Acrobat, MS-Word or WordPerfect files).

4.1.2. All written submissions must include:

a) the name and address of the Participant;
b) the names of all individuals, groups, organizations, or entities on whose behalf the Participant is acting;
c) the name of the person(s) who will present the Participant's submission at the public review sessions;
d) the particular location at which the Participant wishes to make the submission;
e) complete citations of all studies, articles, reports or other documents used in support of the Participant's submission;
f) the Participant's position and recommendations with respect to the Project;

4.1.3. All written submissions received in accordance with this section will be reviewed by the Commissioner and made available at the public sessions, the Commissioner's

office and/or the Commission website (www.wrpublicreview.ca).

4.1.4. Once the notice for public review sessions has been given and a Participant makes or files a submission pursuant to the Operational Procedures, the Commissioner may also request any additional information from that Participant, which in the Commissioner's opinion is relevant.

4.1.5. The Commissioner will not accept any information following the completion of the public sessions.

4.2. Oral Presentations – Guidelines for Participants

4.2.1. Anyone wishing to make a presentation at any public review session is requested to pre-register as a Participant by notifying the Commissioner's office at least ten (10) days prior to the commencement of the public review session. Any person providing timely notice will be included as a Participant and will be given priority to speak. When registering, Participants must provide the information set out in section 4.1.2 above, unless such information will be included as part of a written presentation pursuant to section 4.1.

4.2.2. Persons pre-registered to make oral presentations of a general nature who intend to refer to reports, studies, texts or notes are requested to file with the Commissioner's office prior to the commencement of the public review session, 20 copies of the texts or notes from which they plan to speak, or bring such copies of the texts with them to the public review session.

4.2.3. Persons pre-registered to make an oral presentation during focus sessions described in section 4.3.2., or who will present detailed or technical information (e.g. scientific, technical, project financing etc.) at a general session, must file a written submission with the Commissioner's office at least ten (10) days prior to the commencement of the public review session. This allows the Commissioner, Proponent and Participants the opportunity to review the information and prepare any questions.

4.2.4. A schedule listing the order of presentations by Participants will be available at the beginning of each session.

4.2.5. Persons wishing to make a presentation at any session and who are not pre-registered as a Participant may register prior to the start of a session or during intermission. However, the opportunity to present will depend upon the time remaining after the pre-registered Participants have been heard.

4.2.6. A Participant, including any other individual, group, organization or entity on whose behalf it is acting, will be allowed to make one presentation to the Commissioner per session.

4.2.7. A Participant, including any other individual, group, organization or entity on whose behalf it is acting, may make a presentation to the Commissioner at more than one session, provided the Participant has registered to do so and presentations are not repetitious in substance.

4.2.8. Participants shall prepare presentations so that they can be concluded within fifteen (15) minutes. A longer period may be granted at the discretion of the Commissioner if such a request for more time is provided to the Commissioner's office at the time of registration.

4.2.9. More than one individual may participate in a presentation by a Participant. When a presentation is made on behalf of a Participant by several persons, the collective presentation must take place within the time period assigned for that Participant.

4.2.10. Any oral presentation which refers to written material, including journal articles, studies, reports or a written submission under section 4.1 above should be limited to highlighting essential features of the material or responding to questions on it.

4.2.11. Use of audio-visual materials to complement oral presentations is encouraged. If audio-visual equipment is required for a presentation, the Participant should inform the Commissioner's office at the time of registration.

4.3. Public Review Sessions – Location and Scheduling

4.3.1. Public review sessions will be held in St. John's and in any other locations in the Province as may be determined by the Commissioner. Priority will be given to people wishing to participate in the session held in their area.

4.3.2. In addition to general sessions, focus sessions addressing specific topics which form an integral part of the Development Application may be held in St. John's. These topics will be announced before the public review sessions begin.

4.3.3. The Commissioner may exercise discretion to include or limit presentations as time allows.

4.3.4. A notice outlining the schedule, including dates and locations of the public review sessions, will be published by the Commissioner no later than 30 days before the sessions are to commence. This and any other relevant information is available by contacting the Commissioner's office pursuant to section 5.

4.4 Public Review Sessions – Order of Presentations

4.4.1. The normal order of presentations is as set out below.

4.4.2. The Proponent will make a presentation at the start of each public review session to explain the proposed Project. The Proponent will be allotted 30 minutes to make its presentation. At focus sessions the Proponent's presentation will address the issue

designated for that particular session. Each presentation by the Proponent will be followed by a question and answer period.

4.4.3. Participants who have pre-registered to make an oral presentation will be next to address the Commissioner, followed by Participants who have not pre-registered, if time permits. Each Participant's presentation will be expected to conform with the time allotted and will be followed by a similar question and answer period.

4.4.4. The Commissioner will allow a reasonable opportunity for the Proponent to present a reply to any oral presentation or written submission.

4.5 Public Review Sessions – Guidelines for Questioning

4.5.1. Persons making presentations may be subject to detailed questioning by the Commissioner, the Proponent and by other Participants. The purpose of these questions should always be to elicit information that will help the Commissioner understand more fully the issues which relate directly to his mandate.

4.5.2. The Proponent and Participants should pose their questions in a tone and style that are courteous to, and respectful of, others. Clarity and brevity are encouraged. Questions should be asked in a non-confrontational manner for the purpose of obtaining further information or explanations.

4.5.3. Each presenter may be questioned immediately following his or her presentation. The order of questioning will be determined by the Commissioner but typically will be by the Commissioner and the Proponent or Participants as appropriate. Should time permit, the Commissioner may also invite members of the general public who have not registered as Participants, to ask questions. The Commissioner may ask questions at anytime during the session.

4.5.4. The following points provide general guidelines for questioning during public sessions:

a) Questions should be directed to the Commissioner who may invite the appropriate person(s) to respond to the question;
b) The Commissioner may limit or exclude questions or comments which, in the Commissioner's opinion, fall outside the mandate of the Commissioner, are needlessly repetitive, irrelevant, confrontational, or immaterial;
c) The Commissioner may limit discussion that exceeds the time limit allocated.

4.6 Public Review Sessions – Transcripts and Official Documents

4.6.1. The Commissioner will appoint a person to act as Clerk to the public review sessions. The Clerk will receive the written submissions and other documents presented to the Commissioner and will be present at the sessions to receive and mark exhibits.

4.6.2. Written transcripts will be made of all public review sessions, and will be made available for purchase by the public within a reasonable period of time by application to the Commissioner's office. To facilitate the making of transcripts, speakers should identify themselves when addressing the Commissioner.

4.7 Public Review Sessions – Representation by Agent

4.7.1. The Commissioner encourages Participants who wish to make an oral presentation to speak on their own behalf and ask their own questions at the public review sessions, although representation by an agent such as legal counsel, or technical professionals will be allowed. The sessions will generally be informal in nature and will not have the formality, tone or procedures of a courtroom.

4.8 Public Review Sessions – Interpretation

4.8.1. Public review sessions will be conducted in English. The Commissioner's Office will make every effort to accommodate requests for French translation provided the request is received by the Commissioner in a timely manner as directed by the Commissioner and where translation is required for the proper conduct of the session.

5. REGISTRATION AND INFORMATION

5.0.1. At any time throughout the review, contact can be made with the Commission through the Commission Manager. For further information respecting the public review or to register for either an oral presentation or to file a written submission, please contact:

Geoff Pearcey
Commission Manager
Public Review Commission
White Rose Development Application
Suite 102, Baine Johnston Centre
10 Fort William Place
St. John's, NF A1C 1K4

Tel: 709-754-7691
Fax: 709-754-7692

Website: www.wrpublicreview.ca
E-mail: info@wrpublicreview.ca

5.0.2. Generally, media contacts will be through the Commission Manager and/or the Commissioner.

6. DEFINITIONS

6.0.1. In these Procedures,

a) "Accord Acts" means the *Canada-Newfoundland Atlantic Accord Implementation Act* and the *Canada-Newfoundland Atlantic Accord Implementation Newfoundland Act*;

b) "Board" means The Canada-Newfoundland Offshore Petroleum Board;

c) "Canada-Newfoundland benefits plan" has the meaning set out in section 45 of the Accord Acts;

d) "Commissioner" means the individual appointed pursuant to para. 44(2)(b) of the Accord Acts;

e) "Development Application" means all documentation provided to the Board by the Proponent for the purpose of para. 44 2)(c) of the Accord Acts, to support approval of the Project and shall include but not be limited to, an environmental impact statement, a socio-economic impact statement, a development plan and a Canada-Newfoundland benefits plan;

f) "Development Application Guidelines" means the Development Application Guidelines dated 1988 as published by the Board and available at the Board's website (www.cnopb.nfnet.com) under "Publications";

g) "development plan" has the meaning set out in section 2 of the Accord Acts;

h) "Participant" means a person other than the Proponent, who makes an oral presentation or files a written submission to the Commissioner pursuant to para. 3 and 4 below;

i) "Project" means the proposed development of the White Rose oil field as described at the Proponent's website (www.huskywhiterose.com) under "Project Description";

j) "Proponent" means Husky Oil Operations Limited;

k) "Terms of Reference" means the "Commissioner's Terms of Reference for the Proposed White Rose Project Public Review" as published by the Board and available on their website (www.cnopb.nfnet.com) under "News Releases".

l) "Secretariat" means the Commissioner's support staff obtained pursuant to para. 13 of the Terms of Reference;

m) "White Rose Significant Discovery Area" means the area as referred to in para. 1.3 of the Proponent's "Project Description" (www.huskywhiterose.com).

Appendix D
Listing of Initial Review Submissions

1. Initial Review Submissions

IR-001 Newfoundland and Labrador Building and Construction Trades Council
IR-002 Women in Resource Development Committee
IR-003 City of St. John's
IR-004 Paul Hunt
IR-005 International Union of Operating Engineers, Local 904

2. Commissioner's Request for Additional Information

IR-006 Commissioner's Request for Additional Information from the Proponent (April 26th, 2001)

3. Proponent's Response and Supporting Documents

IR-007 Proponent's Response to Additional Information Request from the Commissioner (June 2001)
IR-008 Henderson, I.M.H. Review of the Selection of an FPSO for the Development of the White Rose Field
IR-009 Purvin & Gertz. East Coast Natural Gas Developments and Markets.

Appendix E
Commissioner's Request for Additional Information

ADDITIONAL INFORMATION REQUEST
APRIL 26th, 2001

INTRODUCTION

On March 16th, 2001 the Commissioner for the public review of the White Rose Development Application released the Development Application documents and announced the start of the review process. The Development Application documents were prepared by the Proponent, Husky Oil Operations Limited, and consist of:

Part 1

- Project Summary
- Volume 1 – Canada-Newfoundland Benefits Plan
- Volume 2 – Development Plan
- Volume 3 – Environmental Impact Statement
  (Comprehensive Study Part One (issued October 2000))
- Volume 4 – Socio-Economic Impact Statement
  (Comprehensive Study Part Two (issued October 2000))
- Volume 5 – Safety Plan and Concept Safety Analysis
- Supplemental Report (March 2001)

Part 2

- 79 detailed technical studies

On March 20th, 2001 the Commissioner requested public input and comment as to whether any additional information is required from the Proponent prior to the start of the public review sessions. Submissions on this subject were to be received by the Commissioner by April 19th, 2001.

The Commissioner has now completed his review of the Development Application Documents and considered the public comment received. As a result, Husky Oil is requested to provide additional information on the topics listed below.

Once this "Supplementary Information" is received, it will be made public and a detailed schedule containing specific dates and locations of the public review sessions will be released. It is anticipated that hearings can begin in late June/early July and that sessions will be held in St. John's, Clarenville and Marystown.

SPECIFIC REQUESTS

Husky Oil is requested to provide the additional information respecting the subject areas outlined below:

DEVELOPMENT PLAN CONSIDERATIONS

Engineering and Management

1. Because certain engineering contracts have already been let, "expressions of interest" involving engineering, procurement and construction have been called for either by Husky, its FEED contractor or other contractors, and because substantive work in these areas of activity has been going on for some time, the Proponent is asked to provide:

    a) a report on the current status of this work, where possible by major elements of the Project, and including for each a description of all contracts let, expressions of interest sought, time-frame for key decisions and, the approximate number of person-hours and/or dollar value involved;

    b) a breakdown of the total engineering work to be undertaken by the Husky Oil organization and its contractors, identifying the different kinds of engineering (systems, design, etc.) to be done by each; and

    c) Husky's estimate, in percentage terms, of how much (person years and dollars) of each kind of engineering work and related procurement and management services will be undertaken in Canada and in Newfoundland.

Financial and Economic

2. To the extent that economics is a determining factor in the "general approach" to development, discuss in as much detail as possible the economic analyses done to date and provide the following information:

    a) an indication of what the Proponent considers an acceptable after tax rate of return on investment, given the level of risks involved;

    b) the range of projected rates of after tax return on investment resulting from the proposed development plan; and

    c) the assumptions used in these projections and the sensitivity of these projections (which may be shown in graphical form) to such factors as:

- changes in capital costs;
- changes in the price of crude oil;
- potential delays in the date of "First Oil";
- changes in resource volumes, either through increased/decreased estimates from the South Avalon pool or earlier inclusion of resources in the West and North pools, currently indicated as "deferred development";
- rate of extraction.

3. Provide commentary on the expected price of crude oil, and the estimated netback price for White Rose crude, over the next 5, 10 and 20 years.

Production System

4. Taking into account that there have been significant cost increases and time delays in the Terra Nova Project and that certain estimates in the concept selection study reference the early Terra Nova information and experience, provide an updated comparison of the FPSO and GBS "production concept" options, including a comparison of the rates of return, and specifically:

    a) provide a summary chart comparing the specific assumptions used in comparing the economics of each alternative;

    b) identify and compare the production profile for each, including the effects of disconnect events on the operation of the FPSO;

    c) identify and compare the differences in capital costs for each; and

    d) identify and compare the differences in Canada-Newfoundland benefits that can reasonably be expected in each case.

Deferred Development

5. Inasmuch as the Development Application is based on the development of the South Avalon oil pool, with development of the North Avalon and West Avalon oil pools, as well as the field's natural gas reserves, deferred to some later date, provide discussion of the rationale for this approach, including:

    a) additional commentary regarding the future timing of natural gas development given the increase in natural gas prices, current supply weaknesses in North America, and the emphasis on other frontier gas developments;

b) under what conditions the Proponent would see developing the natural gas reserves in advance of the current forecast of at the end of the life of the oil reservoir;

c) the results of any studies undertaken to determine the effect on the economics of the White Rose project, if natural gas were to be developed earlier; and

d) the results of any studies undertaken to examine the use of methods other than the use of natural gas and waterflood to provide reservoir pressure maintenance.

Employment and Labour

6. Present more information on the plans and processes Husky intends to implement towards ensuring good labour relations for the White Rose Project.

7. Comment further on plans to implement employment equity and diversity initiatives and to monitor and report, on an ongoing basis, progress in achieving the stated objectives for these initiatives.

CANADA – NEWFOUNDLAND BENEFITS CONSIDERATIONS

8. Provide discussion on whether or not the Proponent considers its commitment to maximize Canada and Newfoundland benefits to be:

   a) a requirement, similar to safety and other regulatory requirements;

   b) one of the criteria to be considered in its "best value" evaluations; or

   c) a factor to be considered after its "best value" evaluation.

9. Given the Proponent's stated commitment to maximize Canada-Newfoundland benefits, provide a discussion on the rationale for not including "benefits" (Canada-Newfoundland content) as one of the selection criteria in the determination of the "preferred" production facility concept.

10. Provide the relative weightings, in the blend of factors comprising "best value", to be used in bid evaluation; specifically, what are the weights given to quality, delivery and service versus cost in determining "best value"?

11. Define the meaning of "essentially equal" as it is used in the bid evaluation process, and indicate how it is determined and by whom.

12. Provide, in tabular form, specific estimates in quantifiable terms of the Canada and Newfoundland content that the Proponent expects will result from its implementation of the proposed Canada–Newfoundland Benefits Plan. Separate the Project period from the Production period, goods and services from labor, and provide the breakdown by various project elements to a similar level of detail as shown in the Development Application for project requirements. Also, please indicate which items are captured locally by geography, as compared to those enticed, attracted or won by the Proponent's pro-active measures.

13. With respect to labour requirements, provide for both the development and operations phases of the project the following information:

    a) existing or anticipated skills gaps and shortages in the labour pool that have been identified;

    b) the Proponent's plan to provide technical advice and other assistance to training institutions to overcome these shortages;

    c) the Proponent's plans to bring discipline-specific, offshore operations training expertise to the province;

    d) estimates of the requirements for divers and for ROVs by type and class;

    e) estimates of the magnitude of the numbers of expatriates anticipated to be required and identify the disciplines involved.

14. Provide suggestions as to the nature and extent of initiatives required in the research and development area to make a meaningful contribution at this time towards the acknowledged goal of building a sustainable oil and gas industry in Newfoundland.

ENVIRONMENTAL AND SAFETY CONSIDERATIONS

15. State the conditions that would lead to discontinuing the seabird monitoring program.

16. Provide an explicit statement as to whether shuttle tankers will be double-hulled, double-bottomed and ice-reinforced to standards equivalent to the Hibernia and Terra Nova vessels.

Appendix F
Public Sessions Schedule

Day	Date	Location	Type of Session
Day 1	July 11th, 2001	Fairmont Hotel, St. John's	General
Day 2	July 12th, 2001	Fairmont Hotel, St. John's	General
Day 3	July 13th. 2001	Fairmont Hotel, St. John's	Focus: Environment, Health & Safety
Day 4	July 16th, 2001	Hotel Marystown, Marystown	General
Day 5	July 18th, 2001	Clarenville Inns, Clarenville	General
Day 6	July 24th, 2001	Fairmont Hotel, St. John's	Focus: Development Plan - Production and Transportation System
Day 7	July 25th, 2001	Fairmont Hotel, St. John's	Focus: Development Plan - Deferred Development
Day 8	July 27th, 2001	Fairmont Hotel, St John's	Focus: Benefits and the Canada-Newfoundland Benefits Plan
Day 9	July 30th, 2001	Fairmont Hotel, St. John's	General
Day 10	July 31st, 2001	Fairmont Hotel, St. John's	General - Concluding Comments

Appendix G
List of Participants Receiving Funding from Provincial Government

Town of Marystown	$5,000.00
Women in Resource Development	$4,375.00
The Former Terra Nova Environmental Assessment Panel	$5,000.00
Newfoundland and Labrador Wildlife Federation	$12,000.00
Suzanne Kelland-Dyer; Carl Powell	$5,000.00
Natural History Society of Newfoundland and Labrador	$12,000.00
Friends Of Gas Onshore	$56,625.00
	$100,000.00

Appendix H
Listing of Presenters at Public Sessions

Participants Appearing Before the Commissioner	Date	Document
Abbott, Don	July 30, 2001	MR-015
Aboulazm, Dr. Azmy	July 12, 2001 July 31, 2001	MR-017
Arnold's Cove Chamber of Commerce	July 18, 2001	MR-037
Arnold's Cove Town Council	July 18, 2001	
Association of Professional Engineers & Geoscientists of Newfoundland	July 18, 2001	MR-014 A&B
Canadian Association of Petroleum Producers	July 18, 2001	MR-030
Canadian Manufacturers and Exporters Association	July 18, 2001	MR-042 A&B
Dicks, Larry	July 27, 2001	MR-072
Discovery Regional Development Board (Economic Zone 15)	July 18, 2001	MR-038
Fish, Food and Allied Workers	July 30, 2001	MR-045
Fisheries Association of Newfoundland & Labrador	July 30, 2001	MR-048
Former Terra Nova Environmental Assessment Panel	July 13, 2001 July 30, 2001	MR-029 MR-049
Friede Goldman Newfoundland Limited	July 16, 2001	MR-007
Friends of Gas Onshore (FOGO)	July 11, 2001 July 24, 2001 July 27, 2001 July 31, 2001	 MR-032, MR-047 & MR-083 MR-074
Hunt, Paul	July 27, 2001	MR-077

Participants Appearing Before the Commissioner	Date	Document
Kelland-Dyer, Suzanne	July 27, 2001	MR-060
Marine Workers Federation CAW/MWF Local 20	July 16, 2001 July 31, 2001	MR-009
Marystown - Burin Area Chamber of Commerce	July 16, 2001 July 31, 2001	MR-011
Montevecchi, Dr. William & Wiese, Francis	July 13, 2001	MR-008 & MR-028
Moores, Graham	July 13, 2001 July 24, 2001	MR-003 MR-018
Natural History Society of Newfoundland and Labrador	July 13, 2001	MR-004 & MR-027
Newfoundland & Labrador Federation of Labour	July 30, 2001	MR-058
Newfoundland and Labrador Building and Construction Trades Council	July 18, 2001 July 24, 2001 July 27, 2001	MR-010 MR-031 MR-040
Newfoundland and Labrador Wildlife Federation	July 13, 2001	MR-002 A&B
Newfoundland Ocean Industries Association (NOIA)	July 11, 2001 July 27, 2001 July 31, 2001	MR-005 A&B MR-064
Operating Engineers Local 904	July 27, 2001	MR-043
Petro-Canada	July 27, 2001	MR-063
Town of Marystown	July 30, 2001 July 31, 2001	MR-046
Women in Resource Development Committee	July 27, 2001	MR-041, MR-068, MR-069 & MR-075

Others Who Addressed the Commissioner

Barron, Len (General Public)

Brett, Herb (Town of Arnold's Cove)

Corbett, Dan (General Public)

Etchegary, Gus (General Public)

Hodder, Mary (MHA, Burin-Placentia West)

Hogan, Holly (Canadian Wildlife Service)

Martin, Tara (General Public)

Powell, Carl (General Public)

Ryan, Pierre (Canadian Wildlife Service)

Sheps, Sid (General Public)

Strong, Rob (General Public)

Appendix I
Listing of Merits Review Submissions

Doc No.	Participant Name & Presentation Title
MR-001	Michael Wallack - Environment, Health & Safety Written Submission
MR-002 A	Newfoundland and Labrador Wildlife Federation - Written Submission
MR-002 B	Newfoundland and Labrador Wildlife Federation - Supporting Documents
MR-003	Graham Moores - Environment, Health & Safety Written Submission
MR-004	Natural History Society of Newfoundland & Labrador - Written Submission
MR-005 A	NOIA - Position Paper. Written Submission
MR-005 B	NOIA - Presentation
MR-006 A	Husky Oil Operations - Analysis of the Economic Impart of the WR project on the NF & Canada Economies
MR-006 B	Husky Oil Operation - Revised Estimated Employment Tables
MR-007	Friede Goldman Newfoundland - Presentation
MR-008	Bill Montevecchi & Francis Wiese - Written Submission
MR-009	Marine Workers Federation Local 20 - Presentation
MR-010	Newfoundland and Labrador Building and Construction Trades Council - Offshore Workplace Safety and Worker Involvement
MR-011	Marystown-Burin Area Chamber of Commerce - Presentation
MR-012 A	Husky Oil Operations - Development Application Intro by J. Blair
MR-012 B	Husky Oil Operations - Project Overview
MR-013	Husky Oil Operations - Development Plan Technical Overview
MR-014A	Association of Professional Engineers & Geoscientists. Presentation

MR-014B	Association of Professional Engineers & Geoscientists. Acts & Regulations
MR-015	Don Abbott - A Paper Soliciting a Combined Response on Environmental and Socio-Economic Impacts
MR-016	Husky Oil Operations - Revised Slide #22 from Jamie Blair Presentation - 01/07/11
MR-017	Azmy F. Aboulazm's brief comments on technical aspects
MR-018	Graham Moores - Production Systems Written Submission
MR-019	Petro-Canada - Letter from Gordon Carrick, Terra Nova Asset Manager - 01/07/12
MR-020	Husky Oil Operations - Resource Volumes Husky vs. CNOPB - Presentation
MR-021	Husky Oil Operations - Field Economics Overview - Presentation
MR-022	Husky Oil Operations - Health, Safety and Environment - Presentation.
MR-023	Husky Oil Operations - Response to MR-001. 2000 Progress Report - Canada's Climate Change - Voluntary Challenge and Registry Inc.
MR-024	Husky Oil Operations - FPSO Disconnection - Presentation
MR-025	Husky Oil Operations - Offshore Installation Manager (OIM) /Master Mariner - Presentation
MR-026	Husky Oil Operations - Drill Cuttings - Presentation
MR-027	Natural History Society of Newfoundland and Labrador - Presentation Slides
MR-028	W.A. Montevecchi & F. Wiese - Protecting Marine Birds and Mammals in the Northwest Atlantic. Presentation.
MR-029	Former Terra Nova Assessment Panel, Dr. Leslie Harris - Draft Presentation Notes
MR-030	Canadian Association of Petroleum Producers - Submission
MR-031	Newfoundland and Labrador Building and Construction Trades Council - Building Resource Opportunities with the Mode of Development
MR-032	Friends of Oil and Gas Onshore (FOGO) - Draft Report - 01/07/13
MR-033	Husky Oil Operations - Project Overview, Marystown & Clarenville

MR-034	Husky Oil Operations - Statement regarding corrections to the Drill Cuttings Disposal Options document.
MR-035	Husky Oil Operations - Referenced Paper: Terra Nova Development: Challenges and Lessons Learned
MR-036	Husky Oil Operations - White Rose Gas Development Study
MR-037	Arnold's Cove Area Chamber of Commerce - Presentation
MR-038	Discovery Regional Development Board, Economic Zone 15 - Presentation
MR-039	Husky Oil Operations - Glossary of Terms
MR-040	Newfoundland and Labrador Building and Construction Trades Council - A Collaborative Approach on Industrial Benefits. Submission.
MR-041	Women in Resource Development Committee - Gender Equity Plan. Submission
MR-042 A	The Newfoundland and Labrador Division Canadian Manufacturers and Exporters - Submission
MR-042 B	The Newfoundland and Labrador Division Canadian Manufacturers and Exporters - Presentation
MR-043	Operating Engineers Local 904, Submission: Addressing the Issue of Deep Sea Diving and Related Occupations.
MR-044	Canadian Nature Federation, Submission: Environmental Impact Statement with Emphasis on Concerns Regarding Marine Birds
MR-045	Fish, Food and Allied Workers (FFAW). Submission.
MR-046	Town Council of Marystown. Presentation.
MR-047	Friends of Gas Onshore (FOGO). Submission: White Rose Asset Evaluation Study Report (Final).
MR-048	Fisheries Association of Newfoundland and Labrador (FANL). Submission
MR-049	Former Terra Nova Assessment Panel. Submission.
MR-050	Commissioner's Letter Requesting Results from Additional Scenarios in the Economic Model.
MR-051	Husky Oil Operations - Presentation: Development Plan - Production System Concept Selection
MR-052	n/a

MR-053	Husky Oil Operations - Response to Commissioner's Question, Re: Topsides Construction Labour
MR-054	Husky Oil Operations - Presentation: Economic Analysis - Supplemental
MR-055	Husky Oil Operations - Submission: Husky Oil Ice Management Operating Philosophy (Clarification Document).
MR-056	Husky Oil Operations - Submission: Updated Original Oil in Place/Original Gas in Place Tables
MR-057	Husky Oil Operation - Submission: Response to Comment "Construction of the FPSO in Canada using modular construction techniques at different Canadian Shipyards should be considered and investigated" (Written submission by Dr. Azmy F. Aboulazm July 12th, 2001.)
MR-58	Newfoundland & Labrador Federation of Labour - Submission.
MR-59	Husky Oil Operations - Presentation: Development Plan: Deferred Development
MR-060	Suzanne Kelland-Dyer - Submission: White Rose… One flower in the garden of our future.
MR-061	Janet Russell - Submission.
MR-062	Husky Oil Operations - Presentation: Canada / Newfoundland Benefits
MR-063	Petro-Canada - Presentation. Re: Inaccurate and Misleading Statements Regarding Terra Nova.
MR-064	NOIA - Presentation. Benefits Focus Session.
MR-065	Husky Oil Operations - Submission. Response to NOIA Presentation of July 11th, 2001.
MR-066	Husky Oil Operations - Submission. Response to Marystown/Burin Area Chamber of Commerce Presentation
MR-067	Husky Oil Operations - Submission. Response to Question Re: Public Availability of Monitoring Reports.
MR-068	Women in Resource Development Committee - Referenced Paper: Where are the Women?, They're Everywhere!
MR-069	Women in Resource Development Committee - Referenced Paper: Women, Equity & the Hibernia Construction Project
MR-070	Husky Oil Operations - Submission. Response to Commissioner's Question Re: GBS Cost Estimate Comparison
MR-071	Husky Oil Operations - Submission. Correction to Mayor Wells Comments of July 24th, 2001.

MR-072 Larry Dicks. Presentation Outline. Benefits Focus Session.

MR-073 Husky Oil Operations - Referenced Report. North Atlantic Pipeline Partners, "White Rose Gas Hub Architecture and Pipelines Breakdown of Gas and Oil Receiving Pipelines".

MR-074 FOGO. Submission. web page article - "Well Intervention: Platform wells produce 25% better than subsea because of routine interventions".

MR-075 Women in Resource Development Committee - Referenced Paper: The Road to Equity.

MR-076 Dan Corbett - Submission: Canada Oil and Gas Production and Conservation Regulations

MR-077 Paul Hunt - Submission. Missed Opportunities.

MR-078 Husky Oil Operations - Presentation. Project Overview, July 30th, 2001.

MR-079 Husky Oil Operations - Submission. Commissioner's Request to Clarify the Gas Resource Recovery Rate

MR-080 Husky Oil Operations - Submission. Revised Slides for July 25th, 2001 Deferred Development Presentation

MR-081 Husky Oil Operations - Submission. Offshore Technology Conference Paper #12970

MR-082 Husky Oil Operations - Submission. Response to Written Submission by the Natural History Society of NF & Labrador.

MR-083 FOGO. Presentation. "White Rose Asset Evaluation".

MR-084 Husky Oil Operations - Submission. Response to question by Rob Strong at the Benefits Focus Session: Logistics Done in NF & Lab.

MR-085 Husky Oil Operations Submission. Requested Summary of Report from US Minerals Management Service - "Comparative Risk Analysis of Deepwater Production Systems".

MR-086 Husky Oil Operations Submission. US Mineral Management Service Report - "Comparative Risk Analysis of Deepwater Production Systems".

MR-087 Patrina Murphy. Written Submission.

Appendix J
Summaries of Participant Presentations and Submissions

Day 1: General Session, St. John's. July 11th, 2001

Newfoundland Ocean Industries Association (MR-005)

NOIA represents 450 companies in the offshore industry of which 70 percent are Newfoundland-based small and medium-sized enterprises. It was primarily this core membership on whose behalf NOIA spoke during the public sessions.

NOIA's presentation had four main objectives for which a detailed rationale and recommendations were provided. The first objective was to support timely, responsible development of the White Rose oilfield and to encourage specific change to the current White Rose Development Plan, particularly to the Canada-Newfoundland Benefits Plan in order to clearly identify benefit targets and to establish mechanisms for measuring benefits.

Second, NOIA said that it is critical that a healthy pace of resource development be established, providing sustained opportunity for NOIA members and their employees and the province generally. Third, NOIA sought to clarify benefits targets to assist in "achieving positive economic impact from the development of our petroleum resources bringing us nearer to the ideals and objectives inscribed in the Atlantic Accord". Fourth, NOIA supported the developer's right to select its preferred mode of development.

NOIA provided a comprehensive set of recommendations including those that addressed gas development (that development of the White Rose Oilfield does not prevent or impede subsequent gas development), expected local benefits (that contract expenditure details be provided), benefits targets, location of engineering and design functions, the best value definition, targets for technology transfer and research and development.

Day 2: General Session, St. John's. July 12th, 2001

Dr. Azmy F. Aboulazm (MR-017)

Dr. Aboulazm addressed the Proponent's concept selection decision. He suggested that new GBS construction technology would significantly reduce the cost of constructing a GBS compared to the costs involved with the Hibernia platform. He also raised a number of questions with respect to construction of the FPSO, particularly whether there were construction techniques, such as modular construction, that would enable the FPSO hull to be built in Canada. The impact of Canada's new shipbuilding policy was also raised. Finally, Dr. Aboulazm asserted that FPSO engineering and construction should use

Canadian manufactured and Newfoundland/Canadian supplied hull-related marine engineering systems, whenever possible.

Day 3: Focus Environment, Health & Safety, St. John's. July 13th, 2001

Newfoundland & Labrador Wildlife Federation (MR-002 A&B)

This two volume submission. It comprises a 24 page main text, with eight appended extracts.

The main submission argues that there is inadequate evidence presented to establish that a floating production platform can operate safely on the Grand Banks. In particular, the NLWF notes that a disconnect/reconnect under emergency or adverse conditions has not been tested. The submission also notes that FPSOs in the North Sea have sustained damage from green water.

The submission argues that the command structure proposed for the production vessel is not adequate. Reference is made to the Terra Nova Panel Recommendation # 43 which addressed the same issue and recommended that "…the marine captain should be ultimately responsible for the safety of the vessel and her crew in respect of all weather or sea-state hazards."

The submission argues that the Proponent has under-estimated the hazard presented to the operation of the Production vessel by ice. In particular, the Participant argues that the Contingency Plan be revised to exclude any scenario which allows for an iceberg (regardless of size) to collide with the production vessel.

The NLWF is opposed to the discharge of pollutants into the marine environment. The submission quotes extensively from a paper by J.Wills in which it is argued that a "zero discharge" regime should apply to offshore hydrocarbon production facilities. This approach would apply to drilling mud, cuttings, and produced water.

In its conclusions, the NLWF requests that the identified safety and environmental issues be remedied before Husky Oil is permitted to proceed with the White Rose Project. An additional recommendation is made that C-NOPB require Petro-Canada to demonstrate their ability to disconnect/reconnect their production vessel before going into production.

Graham Moores (MR-003)

Mr. Moores' submission consists of hand drawn sketches describing vessel safety and evacuation systems, as well as ice management techniques. The submission describes safety challenges faced by a vessel operating on the Grand Banks including the presence of icebergs, topside ice, stress fractures and heavy seas. Mr. Moores outlined a number of alternative evacuation systems involving track systems and elevators to launch lifeboats. Methods for retrieval of lifeboats included retrieval by ships using crane systems and telescoping polls. Retrieval by helicopters was also described.

The submission also described several evacuation crafts such as Sea Beavers which are self-propelled covered lifeboats. The other evacuation craft that was described was the Sea Bell. Mr. Moores described a telescoping ladder that would allow for evacuation from the Sea Bell to a helicopter. All are his own designs.

In his submission and his presentation, Mr. Moores was very concerned about the threat of icebergs. The submission describes several methods to manage ice including using tugs with bumpers to push ice, and using small boats with chains to form a barrier against ice. Systems for deflecting and moving icebergs by attaching chains to them were described. Other deflection methods using propulsion systems attached to the iceberg were also outlined.

Natural History Society (MR-004 and MR-027)

The Natural History Society presented a broad review of key aspects of the Development Application. The first issue addressed by the Society was pollutant distribution. The size of the predicted Zone of Influence was questioned and it was suggested that the actual distribution of pollutants could vary significantly from the model. The Society characterized produced water as containing toxic components, while acknowledging that the level of toxicity is quite low. The major concern expressed was with respect to the long term effects of exposure of plankton, fish eggs and larvae to produced water. An alternative to the discharge of produced water to the ocean would be to re-inject it into the geological formation. Drilling fluids and cuttings were a concern for similar reasons and the Proponent's review of disposal options for mud/cuttings was also commented upon. The presentation provides a comparison of the oil content of the total planned discharges from the production operation compared to accidental spills to show that "planned" discharges far exceed any likely "unplanned" spills. The Society argues that planned discharges should not be permitted when technically feasible alternatives exist.

In a section dealing with Benthos and Spill Monitoring the Society addressed the environmental effects monitoring program proposed for the operation. The presentation argues that monitoring should address both the effects of planned operational discharges as well as unplanned, catastrophic events. There was also some discussion of the potential effects of noise on fish noting that this area of study is in early stages of development. However, preliminary data suggests that fish rely on sound for communication and that noise may have an effect on fish behaviour and possibly population dynamics. Effects on migratory birds and the need for independent monitors to gain more information on these effects were also discussed.

Concern was also expressed regarding the methodology of impact predictions (VEC identification; effects ratings; evaluation criteria - magnitude, extent, duration, frequency, and significance). The review provides a critique of the methodology, and uses bird-project interaction examples to illustrate the possibility that a significant negative impact could occur, and not be detected.

Dr. William Montevecchi and Francis Wiese (MR-008 and MR-028)

Dr. Montevecchi and Mr. Wiese's submission consisted of a review of the literature relating to seabird attraction to offshore platforms, recommendations for research designs to monitor and quantify seabird attraction and associated mortality, and proposals for ways to mitigate possible detrimental effects.

The submission notes that seabirds congregate around oil drilling platforms and rigs in above average numbers due to night lighting, flaring, food and other visual cues. Bird mortality has been documented due to impact on the structure, oiling and incineration by the flare. The environmental circumstances for offshore hydrocarbon development in the Northwest Atlantic are unique because of the harsh climate, cold waters and because enormous seabird concentrations inhabit and move through the Grand Banks. Most of the seabirds in the region are long distance migrants, and hydrocarbon development in the Northwest Atlantic could affect both regional and global breeding populations.

The Participants compared the incidence of spills seen during Coast Guard fly-overs versus the incidence of spills reported by the platform. The results appear to suggest that the reporting of spills from platforms may be significantly misreported. The Participants believe that a comprehensive, independent monitoring system should be established on the oil platforms. The monitoring schemes should monitor seabird association as well as seabird mortality. Elements of the monitoring program were described.

Mr. Wiese described a variety of mitigation measures to reduce seabird mortality including the avoidance of flaring during seabird migrations, the elimination of waste discharges into the surrounding water, shielding lights and reducing the use of lights where possible.

The Former Terra Nova Environmental Assessment Panel (MR-049)

The Former Terra Nova Panel's presentation was presented in two parts: on July 13th and on July 30th. This summary reflects both parts of their presentation. The former panel members reviewed themes from the recommendations contained in the Terra Nova Environmental Assessment Panel report, particularly the precautionary principle, and the responses of the C-NOPB in its decision 97.02 report. In discussing the precautionary principle issues related to the safety of FPSOs in the Newfoundland offshore environment, the command structure on the FPSO and others were raised. Members of the former panel also expressed concern that the precautionary principle was not applied when unanticipated challenges arose and provided several examples from the Terra Nova project. They also spoke of the need for the C-NOPB to have sufficient resources and to clarify what it considers to be the full extent of its mandate.

The former panel members noted that socio-economic benefits were of great concern to the then Terra Nova Panel. The former panel members presented their perspective on the tension between the Atlantic Accord and the *real politik* of global competitiveness. They expressed frustration and concern that general assurances and best intentions commitments on the part of the Proponent were not upheld and recommended that the

Commissioner seek firm commitments with respect to benefits and other issues. The intention of the Terra Nova proponents to relocate engineering to Newfoundland and the subsequent failure to follow through on this intention was extremely disappointing to the former panel members and was cited as an example of the need for firm commitments.

A number of environmental issues were addressed by the Panel including operational discharges, the safety of the FPSO in harsh sea states and other weather conditions and other issues. Concern was expressed that regular planned discharges into the ocean could be overlooked due their apparently small size compared to the vastness of the ocean. Such an approach fails to account for cumulative effects and interrelationships with the fishery. Extreme weather conditions were also of concern. As with all the issues raised by the former panel members, the Board's response to the Terra Nova Panel recommendations was reviewed and information was requested on the status of actions taken as a result of the Board's response. In general, the former panel members were critical of the Board's response to their recommendations.

The former panel members presented the results of a workshop on cumulative effects and suggested that the findings of the workshop be implemented. They concluded with comments on compliance and enforcement, the role of DFO in fostering a more holistic approach to environmental assessment and management and the assessment methodology. The lack of enforcement and compliance of environmental regulations was also noted by the former panel members and independent monitoring was recommended. Comments were also provided on environmental assessment methodology. While acknowledging the challenges involved, the former panel members said that an ecosystem approach to environmental assessment should be sought, rather than relying exclusively on the Valued Ecosystem Component approach. Finally, the former panel recommended that lands opened for exploration should be assessed in terms of their social, environmental or economic value and the findings should be made known to developers bidding on the lands.

Day 4: General Session, Marystown. July 16th, 2001

Friede Goldman Newfoundland Limited (MR-007)

Friede Goldman's presentation was intended to showcase the Company's facilities and expertise in relation to the White Rose Project and to illustrate its capability to fabricate and integrate topsides modules for the Project. Using illustrations of facilities and equipment at FGN facility, the Company presented the advantages of fabricating and integrating the topsides modules in Marystown. These advantages included a resident, stable workforce, a union agreement on the industrial model, competitive labour rates, high quality work and existing infrastructure.

Detailed information was presented on the kind of equipment available at the FGN facility in Marystown, the Company's safety record and the Company's proposal to carry out the work.

Marystown-Burin Area Chamber of Commerce (MR-011)

The Marystown-Burin Area Chamber of Commerce clearly presented its position that it was promoting the Marystown-Burin area as the location for the construction and integration of all topsides work. It outlined in detail its efforts to become informed about the White Rose Project and its efforts to promote the Burin Peninsula as a work site for the Project. Their presentation included letters demonstrating their keen interest in the White Rose Project as well as statements of their disappointment with respect to the amount of work done in the region for the previous two oil developments. They raised a number of questions for the Proponent with respect to labour agreements, the level of benefits to the region if the SBM bid is successful and the Proponent's role in the bidding process being conducted by Maersk. The Chamber also questioned the value of the various packages being tendered and the process that is being used to ensure maximum Newfoundland / Burin Peninsula benefits. Other questions addressed the decision-making process for the partners in the White Rose Project and the impact of Canada's new shipbuilding policy on contracting decisions. The Proponent provided a written response to the Chamber's submission on July 27. The Chamber also made a concluding statement on the final day of the public sessions.

Marine Workers Federation CAW/MWF Local 20 (MR-009)

The Marine Workers Federation complimented the Proponent on its decision to proceed with the Project and outlined reasons why it believed the topsides fabrication and integration should be done at the Marystown Shipyard. These reasons included the existence of an industrial based union model at the yard which it contended was consistent with Morgan Cooper's report on labour relations in the offshore industry. The Participant also described the modern facilities at the shipyard including temperature controlled covered facilities and a deep water, ice-free harbour. The third element of the Federation's presentation was the vast pool of skilled tradespeople that would be available to work on the White Rose Project. The community infrastructure to support the Project and workers was also described. Finally, the presentation closed with a strong statement about the determination of the people of Marystown to gain the opportunity to prove that they are capable of delivering the topsides modules on time and on budget. The Marine Workers also presented concluding remarks at the last day of the Public Sessions.

Day 5: General Session, Clarenville. July 16th, 2001

Canadian Association of Petroleum Producers (MR-030)

The Canadian Association of Petroleum Producers is the lobby group for oil production companies in Canada. CAPP supports the White Rose Development Application and believes it is important for the continued development of Newfoundland's petroleum industry. CAPP's presentation described the kind of business climate that is required for petroleum development. A market oriented policy framework which allows investors/developers to determine the pace, scale, form and path of petroleum development is the first element of such a business climate. This also means that projects

must be allowed to provide a reasonable return on investment. Canada-Newfoundland Benefits are also part of an attractive business climate and current oil projects have provided significant benefits. However, CAPP does not support the notion of stating requirements to deliver specified benefits, or applying agreed-upon remedies or penalties since it believes that such measures imply targets and preferential treatment of some suppliers over others. In CAPP's view, weighting benefits to achieve local preference is not consistent with the competitive process essential to ensuring cost-effective development, is contrary to the Accord Acts and is detrimental to the development of a sustainable industry. A labour relations regime based on best practices and flexible work practices is also a key to petroleum development. The effectiveness and efficiency of the regulatory system is also important to ensuring the competitiveness of Newfoundland's business climate. Regulations must be clear, certain, efficient and predictable. CAPP believes that the current interest in performance-based regulation as opposed to prescriptive regulations is a positive development.

Newfoundland and Labrador Building and Construction Trades Council (MR-010)

The Newfoundland and Labrador Building and Construction Trades Council submission regarding environment, health and safety is entitled: "Offshore Workplace Safety and Worker Involvement".

The submission criticizes the arrangement between the C-NOPB and the provincial Department of Labour delegating responsibility to the C-NOPB for occupational health and safety. The result of this arrangement, according to the Participant is a legislative vacuum and uncertainties surrounding the enforcement of regulations, inspections, worker involvement and worker rights. The C-NOPB's only recourse when regulations are not followed is to shut-down production. This tool is far too broad and is therefore inadequate to enforce the health and safety regulations.

The Occupational Health and Safety regulations have been in draft form for 11 years. This situation is unacceptable. Best practices in this area would require the creation of one central agency with authority for all environmental, health and safety issues, including education, training and enforcement.

Worker involvement is central to the creation of a safe workplace. While the Proponent's Development Application proposes the right of workers to participate in occupational health and safety committees, that right is limited to legislative requirements and where management personnel encourage employees to participate in the identification and management of issues. The submission describes the benefits, particularly to education, training and safety, of a unionized workforce and of involving organized labour in discussions with operators and government.

The submission notes a number of workplace health and safety issues which should be addressed. These include prolonged absence from home, duration of shifts, unreasonable total hours worked, noise and vibration, feeling of insecurity with helicopter transportation, job roles, multiple employer, and potential for drug and alcohol abuse.

The Council also questions whether the C-NOPB has the resources to address safety issues in a rapidly growing offshore industry. The BCTC believes that the oil companies have considerable political influence which must be balanced against an effective regulator – particularly in the area of occupational health and safety.

Association of Professional Engineers and Geoscientists of Newfoundland (MR-014 A&B)

The purpose of APEGN's presentation was to inform the Commissioner regarding the role and mandate of the Association and to encourage the Commissioner to ensure that properly qualified professional people carry out the White Rose Project and do so in a way that recognizes their professional responsibilities. All professional engineers are required by law to register with the Association which ensures that engineers working in the Province are qualified and facilitates the discipline of members who are guilty of malpractice. APEGN also outlined the procedures for non-Newfoundland residents to become registered with the Association and noted that provision can be made for restricted licenses on a short term basis. While not related to the Association's primary mandate, it noted that in order for the engineering sector to grow and gain experience, it is vital that engineering on major projects such as White Rose be done in the province.

Discovery Regional Development Board, Economic Zone 15 (MR-038)

The Discovery Regional Development Board is one of 20 regional economic development boards in Newfoundland and Labrador. The Discovery Board represents the Bonavista Peninsula, the Clarenville area and the isthmus area for a total of 110 communities and 30,000 people. The Discovery Board's presentation noted that Newfoundland's offshore industry is in its infancy and that to achieve growth in the industry all parties must recognize certain common sense realities. The overall economic benefits of the project must be considered by government as well as by the Proponent and the different interests of all parties must be recognized. Any workable approach to development must recognize these interests. The Board supports the Project in principle. With respect to the Board's specific recommendations, it stated that whatever production system is chosen, it should be able to produce and export natural gas. The Board also supported the use of the Bull Arm site for the Project. While oil development should not be delayed until gas development is viable, the Board requested that the Commissioner insist that gas development be given the highest priority and suggested that the Provincial government should be held responsible for the lack of a natural gas development policy. In the end, the utilization of the Bull Arm site and the pursuit of gas development were the primary concerns of the Discovery Board.

Canadian Manufacturers and Exporters, Newfoundland and Labrador Division (MR-042 A&B)

The CME is a national private sector industry association whose members account for 75% of Canada's industrial output and 90% of its exports. Over 16,000 people work in the Newfoundland manufacturing sector. The CME presenter noted that the $4 billion in White Rose expenditures represents a major opportunity for provincially manufactured

goods. However, he pointed out that to ensure the achievement of maximum benefits there must be increased commitment to local procurement of goods and services and broad economic benefits from natural gas development, topsides construction in the province and a stronger commitment to benefits goals and targets at an early stage. The CME is not seeking preference, but a fair opportunity which requires the Proponent to review provincial company capabilities and ensure tender documentation does not preclude provincial companies for non-performance specifications, reduce the practice of bundling so as to provide opportunity to manufacturers rather than distributors, ensure tender documentation is circulated & available, not just 1st Tier Contracts, and assess the impact of the sourcing practices of White Rose contractors and subcontractors to ensure they are providing opportunity to the province's manufacturers - contracting a service to a provincial based distributor does not translate to provincial sourcing.
The presentation outlined several critical reasons why natural gas development would promote economic growth in the province. The CME also addressed topsides development, saying that it is imperative that it be done in the province in order to ensure technology transfer, employment benefits, procurement opportunities and credibility as an offshore service center. In commenting on communication, goals and targets, the CME noted that measurable goals and targets are required and should be identified by proponents when bidding for exploration rights. An improved reporting structure for benefits is also required. The presentation concluded by noting that "this resource has tremendous economic value - but once expended the opportunity is lost. There is no second chance to do it correctly."

Arnolds Cove Area Chamber of Commerce (MR-037)

The Arnold's Cove Chamber of Commerce stated that it supported the White Rose Project generally, subject to the recommendations it presented to the Commissioner. The first recommendation focused on the Atlantic Accord's provisions for local benefits. The Chamber said that the benefits from the project should be quantified so they can be more easily measured and monitored and that this approach is closer to the objectives and ideals of the Atlantic Accord. Furthermore, the Chamber recommended that the Bull Arm site be fully utilized and that all topsides work be done there. The Chamber commended the Proponent for establishing another round of bidding on the topsides work and recommended that the "made in Canada-Newfoundland solution" for topside construction be accepted. Other recommendations outlined the advantages of the Bull Arm site, the necessity of using the Whiffen Head transshipment terminal and the importance of carrying out engineering and procurement in Newfoundland to ensure that local benefits are not unfairly limited. The Chamber said that the Project should go ahead with an oil only proposal as long as such an approach does not compromise or delay future gas development and that Husky should attempt to "fast track" studies related to gas development on the Grand Banks.

Arnold's Cove Town Council

The Arnold's Cove Town Council was represented by Deputy Mayor Herb Brett who stated that the town supports the Bull Arm site for the development of the White Rose Project. The second major focus of the Town is to promote bringing natural gas to the

province. During the discussion with Mr. Brett, he indicated that the Town of Arnold's Cove has benefited significantly by providing accommodations, groceries and other services to the workers on the Terra Nova project.

Day 6 Focus Production System, St. John's, July 24th, 2001

Graham Moores (MR-018)

Mr. Moores' submission contained three sections which illustrated his proposals for production facilities and construction techniques. The first section reviewed fixed and floating systems such as Hibernia and Terra Nova and proposed a new "floating-fixed" platform which could be constructed more quickly and less expensively than conventional fixed platforms. The second section illustrated Mr. Moores' concept of a "floating-fixed" system which used movable concrete blocks to anchor the floating concrete platform in place. Transportation methods for the concrete weights were also described. The third section describes a construction system for a concrete GBS using tracking systems to delivery the concrete and pre-fabricated concrete blocks.

Newfoundland and Labrador Building and Construction Trades Council (MR-031)

The Building and Construction Trades Council submission begins with its interpretation of aspects of the Atlantic Accord related to economic development. For the Building and Construction Trades Council, the overriding question for the Public Review Commission is whether economic growth and development is ensured with the preferred mode of development by the White Rose Proponent. The submission outlines the Council's role in previous offshore projects and the skills and experience they offer to future projects. The Council believes the Proponent should make a greater commitment in three areas as summarized below.

First, the Council expressed concern over the prospect of the importation of a ready-made FPSO for the White Rose Project. It recommended that the Bull Arm site should be the designated, preferred site for construction and fabrication for the offshore industry. Second, the Council questioned whether the Proponent's preferred mode of development would maximize direct employment to the Province. Third, the Council requested that a "fair comparison" of cost estimates for a GBS and FPSO be provided through an independent audit of the Proponent's cost estimates. Finally, the Council called on the Commissioner to "lay the foundation for a resource development strategy that considers the development of the whole offshore petroleum economy… and the sustainable and sequential development of our resources, both physical and human."

Friends Of Gas Onshore (MR-032, MR-047 and MR-083)

Friends of Gas Onshore (FOGO) presented an alternative development plan for the White Rose Significant Discovery Area. The plan was prepared for FOGO by Genesis, a UK consulting firm. The specific purpose of the study was to establish the gas price at which the economic return for a gas export project based on a GBS matches the expected return for the current FPSO based oil project.

The submission describes the methodology used by Genesis in the study. The first step was to benchmark the economic model by using input from the KSLO concept selection study to duplicate, in terms of rate of return, the Proponent's FPSO field development option. Next, based on the KSLO estimates for the GBS, Genesis generated an oil only option with comparable results to the FPSO option. It then looked at two cases. One was a gas hub GBS on the location of the North Pool in combination with the proposed FPSO South Pool oil system. The other was a stand alone GBS to produce both the oil and the gas for White Rose. Both options pick up the gas from Hibernia and Terra Nova and transport it to market by way of a pipeline system, the cost of which is included in the estimates. According to the presentation, these options produce combinations with comparable rates of return to those for the Proponent's oil only system and deserve serious consideration and further engineering work. Overall capital cost estimates are approximately three times the CAPEX for the oil only option.

In its concluding remarks, FOGO provided substantial comments on the overall direction of Newfoundland's offshore sector, benefits accruing from offshore development and the Proponent's concept selection decision. FOGO criticized the C-NOPB for its lack of leadership and failure to protect "the legitimate interests of the people of Newfoundland and Labrador". The review process is important and the documents and issues involved are complex, but no one is promoting the public interest, according to FOGO.

FOGO quoted extensively from the presentation by the former Terra Nova Panel to demonstrate that commitments to best efforts and the regulator's efforts to encourage certain decisions by proponents are insufficient. Firm and specific commitments are required. FOGO presented two recommendations which focused on concept selection and deferred development. First, the Proponent should amend its Development Plan to use the GBS system based on the conclusions of an independent engineering audit, should it prove that the GBS is at least as viable. FOGO suggested that cost over-runs on the Terra Nova FPSO be considered as well as the possibility of icebergs damaging the spider buoy and flowlines which would result in lost revenue and expensive repairs.

Second, FOGO maintains that the public sessions faced a major dilemma created by the Proponent's failure to ascertain the true nature of the resource which it seeks approval to exploit. The Proponent has not drilled sufficient gas delineation wells to determine the White Rose gas reserves, even though it is generally accepted that the field is primarily a gas field. References were made to the delineation efforts of both Hibernia and Terra Nova. FOGO's second recommendation is tied to the first. If there are significant gas reserves at White Rose, then the economic parameters of the production system question would be affected. As a result, FOGO recommended that a decision on the Development Application should be deferred for 12 months to allow two gas delineation wells to be drilled.

Day 8: Focus Benefits, St. John's. July 27th, 2001

Women in Resource Development Committee (MR-041, MR-068, MR-069 and MR-075)

The brief of the Women in Resource Development Committee (WRDC), entitled Gender Equity Plan, puts forward what the Committee believes are "constructive ideas that will enhance the effectiveness of efforts by Husky Oil to recruit, train, hire, retain, and promote Newfoundland and Labrador women in the White Rose Project." The primary concern of WRDC is the achievement of equitable access for women to, and equality between men and women on, the White Rose Project.

The brief is directly primarily to the regulator, the C-NOPB, which the Committee believes has the ultimate responsibility for ensuring that women have access to an equitable share of the dollars allocated for training, and receive a fair share of hires, based on their availability in the Newfoundland and Labrador workforce. Detailed recommendations are made in three areas, development of gender equity terms and reference and guidelines for the project, identification of specific undertakings, and provision of a monitoring and compliance mechanism. Key undertakings include a statement of commitment, gender sensitivity training, the breakdown of various statistical planning data and programs by gender, and a system requiring quantifiable employment and training outcomes. The Committee believes the Board should establish the requirements recommended, provide the consultation and communication mechanism, and establish the reporting and monitoring procedures.

Further, the Committee recommends that, pursuant to Section 45 (4) of the Canada Newfoundland Atlantic Accord, the C-NOPB designate women as a disadvantaged group, using the Federal Employment Equity Act as a model.

Newfoundland and Labrador Building and Construction Trades Council (MR-040)

The Building and Construction Trades Council's third submission to the Commissioner was entitled "A Collaborative Approach on Industrial Benefits". While a large number of tradespeople found work on the Hibernia and Terra Nova Projects, the Council stated that the benefits derived from these projects pale in comparison to the lost opportunities that have been experienced. The Council's concerns and recommendations were grouped into six main topics. The first concern was the development of a sustainable industry. The qualification of benefits provisions in the Atlantic Accord by requirements for international competitiveness is not acceptable to the Council and they contend that it is contrary to the intention of the Accord's authors. A sustainable industry requires facilities and infrastructure and Bull Arm is well positioned to fulfill that role. The Commissioner should withhold its assessment of the Benefits Plan until it is known whether the Bull Arm site will be used. Construction work related to offshore development can contribute to long term sustainable employment and efforts to maximize direct labour from construction activities should not be viewed as "buying short term construction jobs". The Proponent should communicate its intentions with respect to plans for development of the White Rose Project with the Council. The Council also

commented on industrial relations issues and noted that it is willing to commit to new working relationships, but stated that management must be involved in the process and must be committed to meaningful involvement with labour representatives for the new working relationship to be successful. Finally, the Council wants it membership better prepared and would like to work with the Proponent to identify skills gaps, opportunities for technology transfer and succession planning.

Operating Engineers, Local 904 (MR-043)

The Operating Engineers presentation was concerned with deep sea diving and related occupations. The requirements for deep sea diving and the local supply of trained divers were reviewed. It was suggested that this is a prime area for technology transfer and succession planning. The submission recommended that the Proponent identify suitable candidates for training related to diving and ROV operations and send them to a recognized overseas training facility. The Operating Engineers pointed out that since these skills will be required for future projects an ongoing training program should be established.

Suzanne Kelland-Dyer (MR-060)

Ms. Kelland-Dyer's presentation outlines her perspective as a common citizen of the Province with no pre-determined agenda for her review of the White Rose Development Application. The submission reviews Ms. Kelland-Dyer's efforts to gain information about the objectives and membership of Friends of Gas Onshore. Efforts to gain information on the White Rose Project from the Proponent were described. Ms. Kelland-Dyer's conclusion was that the Proponent was forthcoming about its agenda and that the Proponent did not have a negative position regarding gas development.

Ms. Kelland-Dyer's position is that greater focus should be placed on royalties from offshore oil developments than on jobs. Questions about the mode of production and deferred development should be examined in light of their effects on royalty payments. A long term perspective should inform the mode of development question so that we begin to focus on the mode of development to be used in the future. A provincial energy policy is also essential to evaluating plans for gas development. The uses of natural gas should be considered by such a policy. In conclusion, Ms. Kelland-Dyer notes that employment is expected from the White Rose Project, but not at the cost of royalties.

Petro-Canada (MR-063)

Petro-Canada's submission was provided to correct "a number of inaccurate and misleading statements and submissions concerning the Terra Nova development. The submission addresses eight incorrect or misleading statements beginning with the issue of trenching versus covering flowlines. Questions related to the command structure of the FPSO are addressed next, followed by an explanation that the commissioning procedure for the FPSO turret will include connect and disconnect tests. Petro-Canada responded to the members of the former Terra Nova Panel's comments regarding the poor workmanship of some suppliers to the Terra Nova project. The fifth issue addressed by

Petro-Canada was the location of engineering for the Project. It was explained that relocating the engineers was unfeasible for human resources, cost and scheduling reasons. The decision to award the contract to the shipyard before the Board's decision report was addressed. Petro-Canada stated that the contract was to reserve a slot for construction and that to have waited for the Board's decision report would have resulted in more than a year delay. Petro-Canada responded to some criticisms of the company's ability to carry out an effective seabird monitoring program. The final issue addressed was the assertion that Newfoundland receive little benefit from Terra Nova but "fixing other people's mistakes". Petro-Canada presented examples of the benefits that have accrued to Newfoundland from the Terra Nova project and said that the vast majority of the additional work done in Newfoundland was not related to faulty workmanship.

Newfoundland Oceans Industry Association (NOIA) (MR-064)

NOIA's presentation during the Benefits focus session began with reference to its "Position #1" which is founded on deriving positive economic and industrial impacts from oil and gas activity. NOIA also noted that "there is a common-sense maxim on benefits, confirmed by experience of other jurisdictions, which tells us that in order to achieve anything, we must know what we are trying to achieve." To achieve fiscal benefits, a generic royalty regime has been established. NOIA suggests that to complement the fiscal benefit policy, and ongoing industrial procurement policy is required. Such a policy should address the location of engineering and procurement, life of field procurement planning and specific benefits targets for procurement, supplier development, technology transfer and research and development. The remainder of NOIA's presentation explains the industrial procurement policy in more detail.

Engineering and procurement functions of major potential contractors should be located in Newfoundland. With respect to life of field procurement, NOIA sought working amendments to the Proponent's Benefits Plan to make local content part of the best value equation in bid evaluations. Benefits targets were explained as goals within an overall petroleum industry development strategy which would be devised cooperatively by industry and government as opposed to an imposed quota. Furthermore, NOIA believes that the approach presented to the Commissioner is consistent with the spirit and intent of the Atlantic Accord. The presentation explains the kind of information that would be considered in establishing a system of targets and the advantages of appropriate targets. NOIA's rationale for targets is based on the emerging nature of the local petroleum industry and the narrow economics for the Proponent as well as for local oil and gas service companies. The demanding timeline and budget will overtake benefits considerations unless benefits targets are not established early.

Larry Dicks (MR-072)

Mr. Dicks has worked in staff and supervisory positions on both the Hibernia and Terra Nova projects. He presented his assessment of employment, technology transfer and other issues based on his experience with Hibernia and Terra Nova. During the Hibernia project there was an understanding that there would be a certain number of expatriates involved, but people also thought that there would be technology transfer. Mr. Dicks said

that the expectation was that local workers would work closely with the expatriates in order to learn as much as possible. There was some success, but Mr. Dicks felt that a more concerted effort at technology transfer could have been made. On the Terra Nova project, Mr. Dicks felt that many Newfoundlanders had sufficient experience, but were not given opportunities that expatriates received.

Nevertheless, local workers gained considerable experience on Hibernia and Terra Nova and Mr. Dicks suggested that HRDC or the C-NOPB should work to ensure that transfer of technology happens during White Rose and Newfoundlanders are given opportunities to play greater roles.

Day 9: General Session, St. John's. July 30th, 2001

Fisheries Association of Newfoundland and Labrador (MR-048)

The Fisheries Association of Newfoundland and Labrador (FANL) submission describes the Association's mandate of promoting the business development interests of the fishing industry. FANL also describes itself "as an environmental watchdog for the industry, as a steward of renewable resources, and a counter to the oil industry, which has a "visitor" status due to the non-renewable nature of oil and gas resources". FANL believes the concerns of the fishing industry are unique in that they have been the traditional users of the Grand Bank resources for centuries and will be the first to experience negative impacts of the development.

The exploration, development and expansion of the offshore oil and gas industry in Newfoundland are also a matter of concern for FANL, particularly due to the cumulative impact of successive developments. Specific concerns are operational discharges, seismic activities and accidental events such as oil spills and iceberg scour. FANL is also concerned about effects on fish, fish habitat and the overall ecosystem. In addition to physical damage, negative environmental impacts will result in damage to the reputation of fish products in the international marketplace. Such impacts are long lasting and must be considered in any compensation plan. No fishing zones and their likely expansion also remains a concern to FANL. Furthermore, comprehensive compensation programs must be developed and must include plant workers in addition to harvesters.

FANL expressed concern regarding the impacts of operational discharges of drilling wastes and produced water. The long term effects of seismic activities on fish stocks was also an issue of concern as are the cumulative effects of the oil industry. As a result of the potential for significant effects, the results of Environmental Effects Monitoring of each operator must be shared and discussed with the fishing industry.

Communication, cooperation and prevention must be achieved in order for these two industries to coexist and to manage the delicate balance between economic viability and environmental conservation. This is the foundation of FANL's recommendations. FANL is ill-equipped to respond to the issues and risks of offshore oil development and until it is able to interact with the oil and gas sector in an informed manner, FANL has a

great deal of concern as to whether or not the oil industry should be permitted to expand. Given the fishing industry's traditional reliance and utilization of fisheries resources on the Grand Banks, the onus of responsibility falls upon the oil industry to protect fish and critical habitat and to provide resources so the fishing industry can be equipped to respond to the oil industry. This includes the establishment of a fisheries liaison office and independent observers on each oil production facility. Finally, the C-NOPB, as regulator, must ensure that the fishing industry is consulted with respect to the development of the oil and gas sector.

Fish, Food and Allied Workers (MR-045)

The Fish, Food and Allied Workers (FFAW) submission briefly describes the historical attachment of the fishery to the Grand Banks region and the importance of the fishery to the Newfoundland economy. The Newfoundland fishery has experienced significant challenges in the last decade and have accepted short term hardship to ensure the long term survival of the industry. The FFAW is concerned that this hardship could be for nothing if the oil industry hinders the recovery of the fishery. The submission describes the conditions required for the co-existence of the fishery and the oil industry. The first such condition is a recognition by the industry of the historic primacy, renewable nature and the overarching importance of the fishing industry in Newfoundland and Labrador. The FFAW does not accept that the oil industry will not have a significant impact on the fishery. No-fishing zones, seismic activity, spills, drilling and damage to fishing gear and fishing grounds, market tainting are all issues of concern.

In addition to taking all reasonable measures to mitigate the risk of negative environmental impacts, the FFAW believes the C-NOPB should equip the fishing industry to defend its interests and ensure appropriate compensation mechanisms. The FFAW therefore recommends that the oil and gas industry fund a fishery liaison office to work to protect the interests of the fishing sector and formalize ongoing communication between the two industries.

The C-NOPB should direct that a comprehensive compensation program be negotiated between the two industries to offset any losses incurred by the fishing industry as a result of a significant oil spill, accident or loss of traditional fishing grounds.

Newfoundland and Labrador Federation of Labour (MR-058)

The Federation of Labour looks forward to the positive economic impact of the White Rose oilfield, however the people of Newfoundland must receive a fair share of the benefits and environmental protection and health and safety of workers must be ensured as we strive to achieve these benefits. The precautionary principle and regard for cumulative impacts should inform all aspects of offshore oil development.

The Federation's comments and recommendations are grouped into four topics: the review process, considerations of human safety, and environmental protection, the general approach to development and the resulting benefits to the province.

The way the review process is organized makes it difficult for a lay person to become involved. As a result, the Federation recommends that Development Applications, the regulatory acts, and all supporting documents be written in a clear, concise manner so that the non-expert can take a more active role in the review process.

Comments and recommendations with respect to human safety focus on regulatory and jurisdictional issues as well as the role of the C-NOPB as regulator. The Federation recommended a federal-provincial review of the occupational health and safety requirements under the Atlantic Accord, its administration by the C-NOPB and the reporting structure. The C-NOPB must also be provided with adequate resources, including guaranteed funding levels, to effectively and pro-actively carry out its mandate. The Federation also presented a detailed and well researched review of operational safety issues associated the safety of the FPSO. A number of recommendations were made as a result of its review. The recommendations addressed the adequacy of the Temporary Safe Refuge, safety training issues, safety inspections, turret design and the role of unions in promoting safe operations. The Federation outlined a number of concerns related to environmental protection including the capacity to respond to oil spills and the long term effects of offshore development on the fishery.

In reviewing the general approach to development the Federation recommended that the Proponent take the lead in discussions with other producers regarding gas development. It also noted that given the planned 12 year field life and the possibility by its calculation of a shorter life, "it is essential that we maximize every benefit for Newfoundland and Labrador."

With respect to Benefits, the Federation "strongly urges the CNOPB to be more vigilant and pro-active in administering the Atlantic Accord". The Federation points out that accumulated knowledge is the key to a sustainable industry and every contract that goes outside the Province detracts from the ability of local firms to compete on future projects. Job creation and skill transfer targets were recommended. The Federation also commented on clawbacks in the equalization formula noting the need for a period of time in which the clawback on oil revenues would be reduced. Finally, the provincial government should take a more pro-active and strategic approach to economic and social development resulting from the oil and gas industry and all future Development Applications should indicate how the project will advance the Provinces economic and social objectives.

Town of Marystown (MR-046)

The submission by the Town of Marystown describes the Town and its infrastructure including its housing, health, recreation and education facilities. The Town is cautiously optimistic that FGN facilities at Marystown will be used for construction of FPSO topsides and outlines the advantages of the industrial infrastructure at Marystown. These include an ice-free deep water port, modern fabrication yards and a skilled workforce.

The presentation addressed four aspects of the Development Application beginning with Environment, Health and Safety. It is expected that the Proponent will follow the

"highest best practice standards" in the construction and operation of the Project. The Town noted that it does not have the expertise required to evaluated the mode of development for the Project but suggested that it is reasonable to assume that the Proponent would use the GBS concept if it would result in greater profits and advantageous positioning for the offshore gas industry. Similarly, with respect to deferred development, the Town's assessment is based on the assumption that the Proponent "exercised due diligence" in determining the resources of the White Rose field. Finally, the Town believes the FPSO offers Marystown the best chance at meaningful work in the very near future. The submission reviews the Benefits Plan provisions and the expected results for the Town of Marystown which are predicated on the FGN facility receiving a contract to fabricate the topsides modules.

Don Abbott (MR-015)

Mr. Abbott's presentation addressed the broader issues associated with offshore development such as sustainable development, the role of the precautionary principle, cumulative effects and the environmental and socio-economic impact of development. Mr. Abbott posed a question to the Commissioner which aptly encapsulates the themes of his presentation: "Will the White Rose Public Review Commissioner address the bigger picture of offshore development, i.e. will the Commission promote sustainable economic and social development that conserves and enhances environmental quality, and social well-being for the present and future generations of Newfoundlanders and Labradorians?" The answer according to Mr. Abbott lies in a threefold response which his submission outlines in detail. The first requirement is to advance adherence to the cautionary principle. Secondly, the Commissioner's findings should enhance the role of considerations of cumulative effects and regional impacts. The White Rose Project should not be considered in isolation. Finally, Mr. Abbott suggests that information gaps, particularly with respect to socio-economic impacts must be filled.

Day 10: General Session, St. John's. July 31st, 2001

Paul Hunt (MR-077)

In a written submission, Mr. Hunt asserts that Newfoundland has not managed to achieve the maximum economic benefit from its natural resources compared to other jurisdictions. The submission reviews the development of the offshore oil industry in Newfoundland through the Hibernia and Terra Nova projects to demonstrate the opportunities that were missed. He noted that Hibernia was a "kick starter" for the industry and that future projects were expected to build on the results of Hibernia both in terms of employment and royalties. Mr. Hunt expressed a number of concerns with the Terra Nova project. These included: burying, rather than trenching flowlines as originally planned, safety of FPSOs for the Grand Banks, insufficient royalties and less direct employment compared to a GBS.

Mr. Hunt commented on the legislative provisions for the White Rose Development Application public review and criticized the limitation clause in the Commissioner's

Terms of Reference which prevented the Commissioner from considering such issues as royalties and energy policy. With respect to the White Rose Project, Mr. Hunt expressed concern about handling and disposal of drilling fluids and safety procedures. He recommended that safety monitors be present on drilling rigs at all times. He also spoke about needs facing injured workers and recommended that they be designated as a disadvantaged group under the Accord Acts. A recommendation concerning the impact of cost overruns on royalties was also presented along with comments on the generic royalty regime and the need for a provincial energy policy.

Written Submissions (not presented orally)

Michael Wallack (MR-001)

Dr. Wallack observed that Canada has accepted a binding commitment to reduce greenhouse gas emissions under the Kyoto Protocol and that the Terra Nova EAP recommended that "the Proponents be required to modify the production vessel as new technology emerges to reduce the emission of greenhouse gases at the Project site" (Recommendation #64). The Board's response to this recommendation included Condition 19 which required the Proponent to "evaluate and report to the Board the technical and economic feasibility of incorporating measures into the design of its production facilities which will reduce the amount of greenhouse gases released from these facilities."

Dr. Wallack disagreed with the Proponent's view that the effect of greenhouse gas emissions would be negligible and stated that such an assessment lies at the root of the global climate change problem. Dr. Wallack noted that other oil companies have taken pro-active positions with respect to the reduction of greenhouse gases in their operations.

Dr. Wallack urged the Commission to require the Proponent:

- to adopt a comprehensive plan to monitor and report on its greenhouse gas emissions;
- to match industry best practice in energy use per unit of product; and
- to undertake a corporate policy of emissions reductions that is consistent with those called for in the Government of Canada's Kyoto emission targets.

Canadian Nature Federation (MR-044)

The Canadian Nature Federation presented a written submission to the Commissioner which was discussed on July 30, 2001. The submission focused on the effects of the project on marine birds. The importance of the Newfoundland coast, including the White Rose project study area, for marine birds was noted. The vulnerability of marine birds to the presence of oil was noted.

As a result of the importance of the area to a number of species of marine birds and their sensitivity to the presence of oil, the CNF made the following recommendations:

- The project should operate consistent with the Precautionary Principle.

- Since further information is required on marine birds in the area, the CNF requests that the Canadian Wildlife Service be granted adequate resources to conduct basic research on the interaction between marine birds and oil and gas development projects. The CNF also recommends that offshore oil projects allow independent, dedicated and trained marine bird observers on their platforms. The Public Review Commissioner should examine the ways in which monitoring and research results is made available to the public.
- The CNF proposed mitigation measures with respect to the scheduling of flaring operations and limiting the amount of oil that can be discharged with drill cuttings.
- The CNF's recommendations with respect to compliance and enforcement call on government to provide adequate resources for enforcement functions to the relevant regulators. Independent observers should also be placed on oil platforms and a zero-tolerance policy for oil spills should be implemented.

Janet Russell (MR-061)

Ms. Russell presented a written submission which was discussed on July 30, 2001. The submission begins with a discussion of the need for the White Rose Project and CEAA's requirement for consideration of alternatives to the Project. Ms. Russell notes that the use of fossil fuels is a contributor to global climate change and suggests that alternative energy sources would be a better choice.

Assuming that there are no higher-level policy arguments against oil development, the submission considers more immediate concerns with the White Rose Development Application. Most of these concerns were based on an audit of recommendations made by the Terra Nova Environmental Assessment Panel and resulting decisions. Ms. Russell commented on safety issues such as the quick disconnect and the decision-making process for disconnection and risks from ice which she felt were underestimated by the Proponent. A number of environmental protection issues were noted such as disposal of drill cuttings and enforcement of penalties for oil spills. Monitoring issues were raised and a call was made for public reporting of environmental monitors and the placement of independent monitors on production facilities.

Patrina Murphy Russell (MR-087)

Ms. Murphy has worked for the oil and gas industry for over ten years, including on the Hibernia, Transshipment Terminal and Terra Nova projects. In a written submission to the Commissioner, Ms. Murphy expressed a concern with the number of expatriates being employed in the Newfoundland oil and gas industry. She believes that many of the high wage positions have been awarded to expatriates when there are qualified Newfoundlanders available. In instances where qualified Newfoundlanders are not available, the succession planning and technology transfer programs are not adequate. She also suggested that in some cases foreign workers have had negative attitudes towards women in non-traditional trades. A number of questions concerning hiring policies and employment equity were raised.

Appendix K
Relevant Provisions of the Atlantic Accord and the Accord Acts

The Relevant Provisions of the *Atlantic Accord*:

2. The purposes of this Accord are:

   a) to provide for the development of oil and gas resources offshore Newfoundland for the benefit of Canada as a whole and Newfoundland and Labrador in particular;

   c) to recognize the right of Newfoundland and Labrador to be the principal beneficiary of the oil and gas resources off its shores, consistent with the requirement for a strong united Canada.

48. The Board shall seek to ensure that all companies which operate in the offshore area establish offices in the province with appropriate levels of decision-making. In this spirit, the Government of Canada shall ensure, where possible, that Petro-Canada maintains an office in the province with responsibility for its operations in the offshore area.

49. The Government of Canada shall establish in the province, where possible, regional offices with appropriate levels of decision-making for all departments directly involved in activities relating to the offshore area.

Economic Growth and Development

50. It is the objective of both governments to ensure that the offshore area is managed in a manner which will promote economic growth and development in order to optimize benefits accruing to Newfoundland in particular and to Canada as a whole.

51. The legislation implementing the Accord shall provide that before the start of any work program for exploration or field development, a plan must be submitted satisfactory to the Board for the employment of Canadians and, in particular, members of the provincial labour force and for providing manufacturers, consultants, contractors and service companies in Newfoundland and other parts of Canada with a full and fair opportunity to participate in the supply of goods and services used in that work or activity.

    In its review of Canada and Newfoundland benefits plans, the Board shall seek to ensure that first consideration is given to services provided from within Newfoundland, and to goods manufactured in Newfoundland, where such goods and services are competitive in terms of fair market price, quality and delivery.

The Board shall also require that any such plans include particular provisions, consistent with the Canadian Charter of Rights and Freedoms, to ensure that individuals resident in Newfoundland are given first consideration for training and employment opportunities in the work program for which the plan was submitted.

52. Plans submitted to the Board, for the use of goods and services and for employment, including plans for any specified purchases, shall be reviewed by the Board in consultation with both governments which shall advise the Board on the extent to which they provide for full, fair and competitive access. Both governments will attempt to provide a common view to the Board, but where this is not possible, the decision on employment and procurement plans approval shall rest with the Board. The Board shall have the authority to approve such plans subject to the power of joint ministerial direction set out in clause 33.

53. The appropriate Federal and Provincial Ministers shall conclude a Memorandum of Understanding regarding the coordination of industrial and employment benefits by the Board and with respect to the industrial and employment benefits review and evaluation procedures to be followed by both governments and the Board.

55. Benefits plans submitted pursuant to clause 51 shall provide for expenditures to be made on research and development, and education and training, to be conducted within the province. Expenditures made by companies active in the offshore pursuant to this requirement shall be approved by the Board."

The Relevant Provisions of the Accord Acts: (Newfoundland Act.)

Precedence Over Other Acts

4. In case of an inconsistency or conflict between

   a) this Act or regulations made under this Act; and

   b) any other Act of the legislature that applies to the offshore area or regulations made under that Act, this Act and the regulations made under this Act take precedence.

Application

8. (1) This Act applies within the offshore area.

   (2) Subject to section 96, the *Canada Petroleum Resources Act* and the *Canada Oil and Gas Operations Act* and regulations made under those Acts do not apply within the offshore area.

Jointly Established Board

9. (1) There is established, by the joint operation of this Act and the federal Act, a board, to be known as the Canada-Newfoundland Offshore Petroleum Board.
   (2) The board shall be treated as having been established under a law of the province.
   (3) The board has the legal powers and capacities of a corporation incorporated under the *Canada Business Corporations Act* (Canada), including those set out in section 20 of the *Interpretation Act.*
   (4) The board may only be dissolved by the joint operation of an Act of the Parliament of Canada and an Act of the Legislature.

Functions of Board

17. (1) The board shall perform the duties and functions that are conferred or imposed on the board under the *Atlantic Accord* or this Act.

Board's Decision Final

30. The exercise of a power or the performance of a duty by the board under this Act is final and not subject to the review or approval of either government or either minister.

Ministerial Directives

42. (1) The federal minister and the provincial minister may jointly issue to the board written directives in relation to
(a) fundamental decisions;
(b) decisions made by the board respecting the exercise of a power under paragraph 55(1)(b);
(c) public reviews conducted under section 44;
(d) Canada/Newfoundland benefits plans and any of the provisions of those plans; and
(e) studies to be conducted by the board and advice with respect to policy issues to be given by the board to the federal minister and the provincial minister.
(2) The board shall comply with a directive issued under subsection (1).
(3) Directives issued under subsection (1) are not subordinate legislation for the purposes of the *Statutes and Subordinate Legislation Act.*
(4) Where a directive is issued under subsection (1), a notice shall be published in the *Gazette* that the directive has been issued and that the text of it is available for inspection by a person on request made to the board.

Public Review by the Board

44. (1) Subject to a directive issued under subsection 42(1), the board shall conduct a public review in relation to a potential development of a pool or field unless the board is of the opinion that the public hearing is not required on a ground the board considers to be in the public interest.
(2) Where a public review is conducted in relation to a potential development of a pool or field, the board may
(c) where the potential development has been proposed to the board by a person, require that person to submit and make available for public distribution a preliminary development plan, an environmental impact statement, a socioeconomic impact statement, a preliminary Canada-Newfoundland benefits plan and other plans specified by the board; and
(d) require the commissioners to hold public hearings in appropriate locations in the province or elsewhere in Canada and report on those hearings to the board, the federal minister and the provincial minister.

45. (1) In this section "Canada-Newfoundland benefits plan" means a plan for the employment of Canadians and, in particular, members of the labour force of the province and, subject to paragraph (3)(d), for providing manufacturers, consultants, contractors and service companies in the province and other parts of Canada with a fair opportunity to participate on a competitive basis in the supply of goods and services used in a proposed work or activity referred to in the benefits plan.

(2) Before the board may approve a development plan under subsection 135(4) or authorize any work or activity under paragraph 134(1)(b), a Canada-Newfoundland benefits plan shall be submitted to and approved by the board, unless the board directs that that requirement need not be complied with.

(3) A Canada-Newfoundland benefits plan shall contain provisions intended to ensure that

(a) before carrying out any work or activity in the offshore area, the corporation or other body submitting the plan shall establish province an office where appropriate levels of decision-making are to take place;

(b) consistent with the Canadian Charter of Rights and Freedoms, individuals resident in the province shall be given 1st consideration for training and employment in the work program for which the plan was submitted and a collective agreement entered into by the corporation or other body submitting the plan and an organization of employees respecting terms and conditions of employment in the offshore area shall contain provisions consistent with this paragraph;

(c) expenditures shall be made for research and development to be carried out in the province and for education and training to be provided in the province; and

(d) 1st consideration shall be given to services provided from within the province and to goods manufactured in the province, where those services and goods are competitive in terms of fair market price, quality and delivery.

(4) The board may require that a Canada-Newfoundland benefits plan include provisions to ensure that disadvantaged individuals or groups have access to training and employment opportunities and to enable those individuals or groups or corporations owned or cooperatives operated by them to participate in the supply of goods and services used in a proposed work or activity referred to in the benefits plan.

(5) In reviewing a Canada-Newfoundland benefits plan, the board shall consult with both ministers on the extent to which the plan meets the requirements set out in subsections (1), (3) and (4).

(6) Subject to a directive issued under subsection 42(1), the board may approve a Canada-Newfoundland benefits plan.

Licenses and Authorizations

134. (1) The board may, on application made in the form and containing the information fixed by it, and made in the prescribed manner, issue

(a) an operating license; and

(b) subject to section 45, an authorization with respect to each work or activity proposed to be carried on.

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Appendix L
Glossary

abandonment. The decommissioning of facilities and removal of offshore structures following exhaustion of reserves.

bbl. Abbreviation for barrel.

bcf. Abbreviation for billion cubic feet.

BOPD. Abbreviation for barrels of oil per day.

CAPEX. Acronym for capital expenditure.

CSA. Acronym for Concept Safety Analysis.

C-NOPB. Acronym for Canada-Newfoundland Offshore Petroleum Board.

cuttings. Chips and small fragments of rock that are brought to the surface by the drilling mud as it circulates.

delineation wells. Wells drilled after the initial exploration well to give a better understanding of the extent and performance of the reservoir**.**

Development (White Rose Oilfield Development). "Development" refers to all phases of the project, from the decision to go ahead with construction through to abandonment of the field.

direct employment. Employment directly involved in the design, construction, installation, operation and maintenance of all main field components during the development and production stages.

drilling mud. A circulating fluid used in drilling wells. Usually contains weighting agents, viscosifiers and fluid loss additives. Can be water or synthetic based.

drilling rig. A ship-shaped or semi-submersible vessel, or a jackup platform, with equipment suitable for offshore drilling.

EOI. Acronym for Expression of Interest.

FEED. Acronym for front-end engineering and design.

First Oil. Milestone achieved when the first shuttle tanker has been filled with oil from the White Rose production system and the shuttle tanker disconnects from the offloading system.

floating production system. A monohull or semi-submersible vessel with equipment suitable for producing hydrocarbons.

flowline. Pipe which conveys crude oil from the well to the riser, or mud, water or gas from the riser to the well.

FPSO. Acronym for floating production, storage and offloading facility.

full cycle. Method of calculating return on investment that includes "sunk costs"; used to assess whether returns exceed the company's weighted average cost of capital and may affect future capital allocations to business units.

GBS. Acronym for gravity based structure.

glory hole. Hole, excavated in the seabed, in which wellhead facilities are placed for protection from iceberg scour.

half cycle. Method of calculating return on investment on a go-forward basis; used for making individual project decisions.

iceberg scour. Seafloor trench caused by the ploughing motion of an iceberg grounding on the ocean floor.

indirect (spin off) employment. Individuals employed in the offsite manufacture and supply of material inputs required by oil-related activities.

injection water. Water pumped into the formation to maintain reservoir pressure (secondary recovery technique).

manifold. Device which routes the flow from several wells into organized flow streams.

mitigating (mitigative) measure. A procedure designed to reduce or negate the possible harmful effects of a substance or process on a species, habitat or environment.

mmbbls. Abbreviation for million barrels

NEB. Acronym for National Energy Board.

On-shore/at-shore hook-op. The installation, testing and commissioning of topsides modules at a designated hook-up site.

OOIP. Acronym for original oil in place.

Operations Phase. The period following First Oil until cessation of all oil production from the White Rose oilfield.

OPEX. Acronym for operating expenditure.

PAU. Acronym for pre-assembled units.

reserves. That part of an identified resource from which a usable mineral or energy commodity can be economically and legally extracted at the time of determination.

reservoir. A subsurface, porous, permeable rock body in which oil or gas has accumulated; most reservoir rocks are limestones, dolomites, sandstones, or a combination of these.

resource. An initial volume of oil and gas that is estimated to be contained in a reservoir.

RFP. Acronym for request for proposal.

riser. A flowline carrying oil or gas from the seabed to the deck of a production platform or a tanker loading platform.

ROR. Acronym for rate of return.

ROV. Acronym for remotely operated vehicle.

scour. (a) Seafloor trench caused by the ploughing motion of an iceberg grounding on the ocean floor. (b) Seafloor erosion caused by strong currents, resulting in the redeployment of bottom sediments and formation of holes and channels.

semi-submersible. A drilling or production vessel that has the main buoyancy chambers (pontoons) below the active wave zone to provide enhanced vessel stability.

shuttle tanker. A ship with large tanks in the hull for carrying oil or water back and forth over a short route.

spider buoy. Disconnectable interface between the risers and the FPSO.

tcf. Abbreviation for trillion cubic feet.

template. Device through which a group of wells is drilled and produced.

topside (or topsides) facilities. The oil- and gas-producing and support equipment located on the top of an offshore structure.

tree. (a) An arrangement of valves placed on top of a well to control flow from the well. (b) An arrangement of valves and fittings attached to the tubing head to control flow and provide access to the tubing string.

turret. A low, tower-like structure capable of revolving horizontally within the hull of a ship and connected to a number of mooring lines and risers. It allows the ship to rotate with the weather while maintaining a fixed mooring system.

umbilical. Device through which control of subsea instrumentation is maintained from the FPSO.

VEC. Acronym for Valued Environmental Component.

Appendix M
Acknowledgements

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