

Canada-Newfoundland Offshore Petroleum Board

Status Report

Terra Nova Project Environmental Assessment Panel
Recommendations

May 14, 2002

INTRODUCTION

On August 5, 1996, Petro-Canada submitted an application to the Canada-Newfoundland Offshore Petroleum Board to develop the petroleum resources of the Terra Nova field. On December 2, 1996, the Board referred for review, the application documents to the Terra Nova Project Environmental Assessment Panel, which had been jointly appointed by the provincial and federal governments.

According to its terms of reference, the Panel conducted a review of: the environmental effects of the Project; considerations of human safety incorporated into the proposed design and operation of the Project; the general approach to the development and exploitation of the petroleum resources respecting the Project; and the employment and industrial benefits that were expected to accrue to the Province and Canada from the Project.

The Panel commenced public hearings on April 22, 1997, and in August, 1997 submitted its report containing 75 recommendations to governments and the Board. The Board dealt with each of the Panel's recommendations, and approved the Project in its *Decision 97.02* (December, 1997) report. For those recommendations that dealt with matters outside the Board's jurisdiction, the Governments of Canada and of Newfoundland and Labrador described to the Board their respective positions concerning the recommendations. Those responses were recited without substantive change.

This report, *Canada-Newfoundland Offshore Petroleum Board Status Report-Terra Nova Project Environmental Assessment Panel Recommendations*, provides a status update on each of the Panel's 75 recommendations, and is formatted as follows: the recommendation itself; the verbatim response to the recommendation contained in *Decision 97.02*; and the response status. It is noted that a majority (65%) of the Panel's recommendations are directly related to the production operations phase of the Project which commenced on January 20, 2002.

Recommendation 1 The Panel recommends that the Government of Canada, the Government of Newfoundland and Labrador and the Board give approval for the Terra Nova Development to proceed subject to the recommendations in this report.

Decision 97.02 Response The Board has approved both the Benefits Plan and the Development Plan subject to the conditions set out in this Decision Report.[s. 1.1, p. 1]

Response Status The Board attached 23 conditions to the Terra Nova Approval. The Board considered the 75 recommendations by the Panel. Appendix C of Decision Report 97.02 presents the response to those recommendations which are not explicitly disposed of in either the Canada-Newfoundland Benefits Plan decision (Chapter 3) or in the Development Plan decision (Chapter 4) sections of the Decision Report.

Recommendation 2 The Panel recommends that a precautionary approach govern all aspects of the Terra Nova Development.

Decision 97.02 Response The Board wishes to emphasize that in all of its decisions respecting the approval of activities in the Newfoundland Offshore Area, it has adopted an approach which is consistent with the definition of the precautionary principle enunciated in Principle 16 of the *Rio Declaration on Environment and Development* which states, inter alia, 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 Board will continue to use this approach in its decision making relative to the Terra Nova Project. [s. 4.4, p. 48]

Response Status The Board continues to be guided by Principle 16 of the Rio Declaration.

Recommendation 3 The Panel recommends to the Government of Canada and the Government of Newfoundland and Labrador that adequate resources be allocated to the Board for the implementation and follow-up of the recommendations of this report.

Decision 97.02 Response. Accept intent. In allocating the resources with which it is provided by the federal and provincial governments, the Board will ensure that the spirit of this recommendation is followed.

The Board understands that the federal and provincial governments will continue to review annually the resource requirements of the Board as part of their overall budget considerations...[Appendix C, s.1, p.69]

Response Status Governments have met the Board's requests for budget increases. The funding approved by governments, as noted below, has been increased by 87 percent since 1998.

1998-99:\$2,886,000

1999-00:\$4,343,000

2000-01:\$4,925,000

2001-02:\$5,400,000

For the same period, the Board's staffing level has increased from 29 to 40. Most of the new staff were hired for the areas of safety, environment and resource management.

Recommendation 4 The Panel recommends that the Board take a more active role in the exercise of its full mandate.

Decision 97.02 Response. Accept. The Board has always vigorously exercised its mandate within the limits of its statutory authority. It recognizes that a contrary perception may sometimes arise in the public mind, and notes that the Panel has addressed this matter in another recommendation (23), suggesting that the Board implement a regular public information program regarding its activities. The Board will, in exercising its mandate with respect to offshore activities, seek to operate in a manner that is compatible with the intent of these recommendations.[**Appendix C, s. 1, p. 69**]

Response Status Unchanged. See also response at recommendation 23. With the start-up of production at Hibernia, the Board is active in all areas of its mandate from initial rights issuance through to production regulation.

Recommendation 5 The Panel recommends that the Proponents use their best efforts to ensure that local fabrication yards have the information and support necessary to take advantage of opportunities to upgrade project management, procurement and quality control systems to the highest recognized international standards.

Decision 97.02 Response The Board is satisfied that the Proponent's Benefits Plan provided for ensuring that local fabrication yards have the information and support to take advantage of opportunities to upgrade their management systems.[**s. 3.4.1, page 20**]

Response Status Early in 1998, the Proponent provided the results of a comprehensive pre-qualification process which assessed the capacity of 35 eastern Canadian fabrication yards to fabricate topsides modules for the Terra Nova FPSO. This assessment included site visits to all major fabrication yards in the Province.

Recommendation 6 The Panel recommends that the Board approve construction of project facilities in foreign countries only if the quality assurance and quality control of

that country are equal to or better than in Canada, and also where the means for monitoring and control of quality are in place.

Decision 97.02 Response The *Newfoundland Offshore Petroleum Installations Regulations* require an installation to be designed, constructed, installed and commissioned in accordance with standards respecting quality assurance published by the Canadian Standards Association. In addition, the *Newfoundland Offshore Area Petroleum Production and Conservation Regulations* require that, before production operations may be authorized, the installation have a Certificate of Fitness issued by a recognized Certifying Authority (CA). The *Newfoundland Offshore Certificate of Fitness Regulations* define the bodies which may act as a CA and require the CA to determine whether the design, construction and establishment of installations are in accordance with the regulatory requirements.[s. 4.3.1.2, p. 39]

Response Status All Terra Nova contractors were required to comply with the ISO 9000 quality standards. Lloyd's Register was engaged as the Certifying Authority for the Terra Nova Project. The Lloyd's scope of work for the certification of the Terra Nova installation that identified their survey (monitoring) of construction/ fabrication was approved by the Chief Safety Officer on December 22, 1998.

The quality programs at the various fabricating locations were reviewed and accepted by Lloyd's. Lloyd's surveyors monitored the implementation of the quality program at the various sites in the quality control of the project activities and collation and traceability of documentation. Lloyd's also conducted selected survey activities including monitoring inspection and testing, spot checks and witnessing confirmatory tests. In addition, there have been visits by Board safety officers to the offshore sites.

The bottom line for the Board is that regardless of where such work is done, it must meet the specified health, safety and environmental standards before the facilities are permitted in the Newfoundland offshore area.

Recommendation 7 The Panel recommends that the Proponents be required to use their best efforts and bidding processes to cause the successful international supplier of sub-sea systems to set up assembly and fabrication facilities in Newfoundland, using local labour trained to produce quality products.

Decision 97.02 Response It is the Board's overall assessment that the Proponent's policies related to the development of Newfoundland and other Canadian suppliers are consistent with the full and fair opportunity and first consideration provisions of the Accord Acts. The Board has noted the Proponent's undertaking to use its "best efforts" to cause the fabrication, assembly and outfitting services associated with the platform topsides and subsea facilities, mooring system and production risers be performed in Newfoundland. The Board believes that this work, which constitutes a significant portion of the work associated with the project phase of the Development, represents significant

opportunities for the Province to further develop its offshore industrial infrastructure and to achieve the establishment of competitive world-class facilities for offshore projects.

While the Proponent's "best efforts" undertaking is qualified by certain conditions, in the Board's view it implies that a significant extra effort will be made to achieve the described outcomes, and the Board expects the Proponent to be able to demonstrate that such efforts have been made.

The Board expects the Proponent to take all practicable measures to achieve the desired outcomes, including, but not necessarily limited to, the full disclosure of information related to the project's requirements and timely consultations with the Owners (or their representatives) of major fabrication facilities in Newfoundland in order to assist them in meeting the commercial and technical needs of the project. The Proponent's efforts to cause the establishment of a new labour agreement at the Bull Arm site are, in the Board's opinion, consistent with this undertaking. To enable it to ascertain that the Proponent is using its "best efforts" in this regard, it is a condition of the Board's approval that:

Condition 6:

As the Project evolves, the Proponent consult the Board regarding its decisions related to all contracts associated with the construction of topsides and subsea facilities, mooring systems and production risers from the initial pre-qualification of bidders to contract award to demonstrate that it is using its best efforts as described in the Benefits Plan to cause this work to be performed in Newfoundland. [s. 3.4.3, p. 22]

Response Status The proponent carried out an intense assessment of the ability of fabrication yards in the province to construct subsea components for the Terra Nova project. In March of 1998, the Proponent brought representatives from Friede Goldman of Marystown and NewDock of St. John's to Norway to view how these subsea systems are fabricated. NewDock was ultimately selected by the Proponent to fabricate three of the seven subsea systems required for the Terra Nova Project. This work included sending a team of personnel from NewDock to Norway for a period of intense training/technology transfer in preparation for the work. NewDock successfully completed all work assigned and is currently supplying similar system components for other projects in the world.

The Proponent's response to **Condition #6** has been accepted.

Recommendation 8 The Panel recommends that the Board monitor and review the qualifications required for all jobs to ensure that residents of the Province are not excluded by unreasonable or unnecessary qualification requirements or other artificial barriers, and that the maximum number of apprenticeships permitted by union constitutions are filled by local people.

Decision 97.02 Response The Board intends to review job qualifications on a selective basis, concentrating on those positions which the Proponent is proposing to fill with out-of-Province workers. To the extent that work on the development will be executed under a union agreement and subject to such terms, the Board fully supports the principle that the maximum number of apprenticeships permitted by union constitutions be filled by local people. The Board recognizes that the number of apprenticeship positions available may be limited by job requirements. [s. 3.3, p. 17]

Condition 2:

For each fabrication and construction to be executed onshore Newfoundland (or in another part of Canada) and for each construction and installation contract to be executed at the Terra Nova field, the Proponent, upon award of contract, provide the Board with a complete description of the labour requirements associated with the contract, an assessment of the availability of local people to meet the requirements, a description of its plans for implementing training programs, and an estimate, by trade or occupational group, of the required number of out-of-Province and foreign workers. [s, 3.3.1, p. 18]

Response Status In response to Condition #2, the Proponent provided detailed information with respect to all labor requirements for all work activity to take place in the Province. This information was shared with relevant government departments and reviewed carefully for compliance with relevant acts.

As required in the approval of the Benefits Plan and in response to Condition #3, the Proponent provided a comprehensive Human Resource Plan for the operations phase of the Project. This plan was shared with relevant government departments. The Plan provides for 90% of steady state operations personnel to be residents of the Province. Just prior to “sail-away” of the Terra Nova FPSO from Trinity Bay, the FPSO offshore team of 98 persons was composed 100% of Canadians of whom 88% were Newfoundland residents at the time of hire.

Recommendation 9 The Panel recommends that the Proponents be required to identify to the Board the level and type of qualifications required for positions on their remote operating vehicle crews and indicate where such training can be obtained and that the Board initiate arrangements for establishing appropriate training in the Province.

Decision 97.02 Response The Board supports the thrust of the Panel’s recommendations related to diving and ROV personnel but notes that responsibility for initiating institutional training resides with the Government of Newfoundland & Labrador. For its part, the Board will ensure that these requirements of the development are identified by the Proponent and that the necessary information is provided to the responsible government department(s) by requiring, as a condition of its approval that:

Condition 2:

For each fabrication and construction to be executed onshore Newfoundland (or in another part of Canada) and for each construction and installation contract to be executed at the Terra Nova field, the Proponent, upon award of contract, provide the Board with a complete description of the labour requirements associated with the contract, an assessment of the availability of local people to meet the requirements, a description of its plans for implementing training programs, and an estimate, by trade or occupational group, of the required number of out-of-Province and foreign workers. [s, 3.3.1, p. 18]

Response Status As required in Condition #2, the Proponent provided detailed employment information with respect to all activity in the offshore area which required the use of ROV operators and the ability of Canada or Newfoundland to supply this requirement. This information was shared with governments for review and assessment. Board staff worked closely with immigration officials in this regard. The Proponent's response to Condition #2 has been approved.

During the construction phase, approximately one third of the ROV employment was Canadian. In the operations phase, 100% of the ROV employment is Canadian.

Recommendation 10 The Panel recommends that the Proponents be required to reassess their need for deep-sea diving throughout the life of the Project and report the findings to the Board and that, if a need for divers is demonstrated, the Board initiate arrangements for appropriate training in the Province.

Decision 97.02 Response As per Recommendation 9 above.

Response Status The offshore industry today is trending away from the use of divers. This is primarily due to the high risk nature of the work and also the high cost involved with supporting this type of operation. To the extent that diving was part of marine installation work for the Terra Nova Project, detailed information as it relates to the need for divers was provided in response to condition #2. Again, this information was shared with relevant government departments with responsibilities in this area and closely assessed. All available Canadian qualified divers were engaged in these Terra Nova marine activities.

Recommendation 11 The Panel recommends that as part of the benefits plan approval process, the Proponents supply: a list of skills required for the various trades throughout the life of the Project; an explanation of where shortfalls of skills are anticipated when compared with the local labour force; and, a plan for cooperation with government agencies, training institutions and unions to develop and fund training programs for Newfoundland trades people to attain the level of skill required for the Project. Such training programs should provide for periodic updating as the Project proceeds.

Decision 97.02 Response The Board concurs with the view that the flow of employment benefits during the project phase will depend largely on the results of competitive bidding for fabrication and construction contracts. The Board will monitor the bidding process to ensure that the Proponent meets its obligation to require contractors proposing to undertake work in Canada, and in particular in Newfoundland, to adhere fully to the employment provisions of the Accord Acts. The Board expects that the Proponent will be in a position to award most, if not all, of its major fabrication and offshore construction contracts by early 1998. For those contracts to be executed in Canada, the Board intends to review the employment and training plans associated with the conduct of the work to ensure they provide for the maximum participation of Newfoundland residents and other Canadians.[s. 3.3.1, p. 18]

Response Status In response to Condition #2 the Proponent provided detailed employment information with respect to all work activities in the Province associated with the project. This information was shared with relevant Government departments for assessment.

The Proponents response to Condition #2 has been approved.

Recommendation 12 The Panel recommends that the Board and the Proponents work with school boards to promote an interest in careers in the oil industry, through participation in career days, guest lecturing in science courses, providing scholarships, and the like.

Decision 97.02 Response The Board's staff have in the past visited numerous schools and post-secondary institutions in the province to provide information on the offshore industry and the Board's activities. The Board intends to continue this practice, within the limitations of its resources, and will encourage the Proponent to undertake similar initiatives.

In addition, the federal government has committed to work with the provincial government in this regard.[Appendix C, s. 2, p. 69]

Response Status Board staff have taken a very active role in enhancing geoscience education and research in the community. Academic and industry researchers have been brought together to evaluate common research interests; advice and information has been provided to earth science students from local academic institutions; and staff members participate in local, national and international geoscience committees.

The Board notes the substantial contributions made under the Offshore Development Fund in support of academic institutions and programs in the Province. The Board recognizes that further work needs to be done to increase awareness of career opportunities in the offshore oil and gas business.

Recommendation 13 The Panel recommends that the Proponents provide to the Board, to government and to educational institutions information on jobs in the operations phase, including specific qualifications required, to allow planning to take place regarding the development of any new training required.

Decision 97.02 Response The Board expects the Proponent to take measures to provide Newfoundland residents with the training and experience necessary to qualify them for long-term employment opportunities. For example, recent technical school graduates or technical personnel with insufficient work experience could be hired well in advance of the commencement of producing operations and assigned to similar operations elsewhere to attain the necessary qualifications to fill positions associated with the operations phase of Terra Nova. The Board believes that the Proponent's commitment to provide a human resources plan associated with operations is a useful starting point. It is the Board's assessment that such a plan should cover all, not just engineering and technical, positions associated with operations. To ensure the timely development of a human resources plan, it is a condition of the Board's approval that: **(Condition 3): Within six (6) months of Project Sanction, the Proponent submit to the Board a comprehensive human resources plan, acceptable to the Board, for the operations phase of the Development covering all drilling, producing, crude transportation and support activities. The Plan should provide for the maximum practicable level of participation of residents of the Province in the operations phase workforce and, to the extent practicable, the succession of Canadians, and in particular residents of the Province, to positions initially held by non-Canadians. [s. 3.3.2, p. 18-19]**

Response Status In response to Condition #3, the Proponent provided a comprehensive Human Resource Plan for the operations phase of the Project. This plan was shared with relevant government departments. The Plan provides for 90% of steady state operations personnel to be residents of the Province.

Just prior to "sail-away" of the Terra Nova FPSO from Trinity Bay, the FPSO offshore team of 98 persons was composed 100% of Canadians of whom 88% were Newfoundland residents at the time of hire.

The Proponent's response to Condition #3 has been approved.

Recommendation 14 The Panel recommends that the Proponents require contractors and subcontractors to work towards developing a true partnership with workers and their representatives.

Decision 97.02 Response This recommendation is directed to the Proponent, but is related to the conduct of industrial relations, which is governed by the provincial *Labour Relations Act*. This *Act* is administered by the Department of Environment and Labour of the Government of Newfoundland and Labrador. **[Appendix C, s.2, p.69]**

Response Status In October 2000, Morgan Cooper was contracted by the then Department of Environment and Labour to carry out a review of labour relations in the oil and gas sector. His report was released on March 6, 2001. Most of the recommendations are directed to employers and employees, encouraging them to work together to identify and solve common problems. The Newfoundland government subsequently amended the Labour Relations Act, in response to seven of the seventeen recommendations contained in the report.

Recommendation 15 The Panel recommends that, if a union agreement is negotiated for offshore workers, it should be between single entities and should clearly provide for a flexible workforce that is not hidebound by the existence of rigidly narrow trade classifications.

Decision 97.02 Response This recommendation pertains directly to labour relations, which are governed by the provincial *Labour Relations Act*, administered by the province's Department of Environment and Labour.[Appendix C, s.2, p.70]

Response Status In October 2000, Morgan Cooper was contracted by the then Department of Environment and Labour to carry out a review of labour relations in the oil and gas sector. His report was released on March 6, 2001. The Newfoundland government subsequently amended the Labour Relations Act, in response to seven of the seventeen recommendations contained in the report. The issue of a 'single union' was addressed in the amendments.

Recommendation 16 The Panel recommends that the Proponents require their contractors and subcontractors to educate their management staff, down through the supervisor level, about the rationale for and the requirements of the Atlantic Accord, so that all decisions can be made in the context of that Accord.

Decision 97.02 Response The Board is satisfied that the policies and procedures outlined in the Benefits Plan will provide for all reasonable measures to be undertaken to ensure that contractors and subcontractors comply with the requirements of the Accord Acts. [s. 3.4.1, p 20].

Response Status In July of 1998, Board staff conducted an audit of procurement systems and procedures in place at contractors' offices in Leatherhead, Houston and St. John's to ensure that requirements with respect to compliance to industrial benefits commitments were communicated down the contracting chain. The review concluded that the actions of the Proponent were satisfactory in this regard.

In 1999, the Board engaged Consulting and Audit Canada (CAC) to conduct a process and procedures verification of content reporting for the Terra Nova Project. The verification exercise assessed the adequacy of the policies and procedures of the operator, contractors, and subcontractors for calculating and reporting content, and the accuracy of

reported content amounts. The Terra Nova verification exercise was not a process to determine whether or not any given level of content had been achieved as no target levels were set for this project.

As a result of its work, CAC recommended improvements to reporting processes and worked with the operator to effect these improvements. All matters raised by CAC were addressed by the Board and the operator.

Recommendation 17 The Panel recommends that the Board discontinue the practice of establishing employment targets for Canadian, and in particular, Newfoundland workers.

Decision 97.02 Response The Board will not establish employment targets for the Development. The Board has never adopted such a practice in the past and stated in Section 2.2.1 (p. 9) of its Decision 86.01 approval of the Hibernia Project, that it “does not support the establishment of specific employment goals, expressed in either absolute or percentage terms for the Project”. [s. 3.3, p. 17]

Response Status No further action required.

Recommendation 18 The Panel recommends that the Board insist upon compliance with the spirit and intent of the Atlantic Accord so as to avoid the necessity for bringing personnel from outside the Province solely because the need was not identified early enough to permit the training of local residents.

Decision 97.02 Response The Board will continue to require operators of exploration and development projects offshore Newfoundland to comply fully with all of the requirements of the Accord legislation, including those related to the employment of Canadians and, in particular, Newfoundland residents. The Board agrees that the early identification of labour requirements is fundamental to ensuring that opportunities for training local people to meet the labour requirements of the Development are captured. It also notes the Proponent’s commitment to provide timely information on employment to Governments, industry associations, educational institutions and the public. The Board believes, however, that it may not be possible, nor feasible, to initiate training of local people to fill all positions associated with the Development, especially those of short duration or requiring specialized skills and experience. [s. 3.3, p. 17]

Response Status The proponent reported employment information on a regular basis throughout the construction phase of the Terra Nova Project and this information was shared with governments. The format and reporting frequency of this information was agreed with the Board. Significant attention was paid to evaluation of the need for any foreign workers for the project throughout this period. At peak employment in February 2001, 2575 people were employed on the Terra Nova Project: eighty two percent were Newfoundland residents, eight percent were other Canadian residents, and ten percent were foreign residents.

Recommendation 19 The Panel recommends that the Government of Canada and the Government of Newfoundland and Labrador require the Board to prepare an assessment of the effectiveness of the Accord Acts in securing first consideration for employment of Newfoundland residents, together with recommendations, if necessary, for strengthening the provisions of the Accord Acts or its regulations so that benefits accrue to Newfoundlanders according to the original spirit and intent of the Accord. Furthermore, the Board should carry out regular periodic reviews of the effectiveness of the Accord Acts in the future.

Decision 97.02 Response. Accept intent. The *Accord Acts* require project proponents to submit a Benefits Plan to the Board for approval. The Board must satisfy itself that there is full and fair opportunity for Canadians to compete for access to employment and to participate in the provision of goods and services related to the project. The *Accord Acts* do not set out targets or quotas, nor do they guarantee employment or the awarding of contracts.

The federal and provincial governments have noted that, pursuant to sub-section 17(2) of the *Accord Acts*, the Board may make recommendations to both governments with respect to proposed amendments to the *Accord Acts* and the regulations. Therefore, the Board may decide on its own motion, at any time to undertake such a study.

The governments of Canada and of Newfoundland and Labrador, also are aware of the diversity of issues that can arise with respect to the application and administration of the benefits provisions in the *Accord Acts*. In this regard, the federal department of Natural Resources and the Newfoundland Department of Mines and Energy together with the Board will convene a technical conference on benefits in 1998. [Appendix C, s.2, p.70]

Response Status The Board administers benefits in accordance with the provisions set out in the legislation and guidelines. The Board had strengthened its benefits department through the addition of staff.

Board benefits officials regularly consult with governments and information is exchanged and meetings held. While no technical conference on benefits has occurred, there have been meetings initiated by the proponent and substantial interaction among the proponents, the local industry represented by NOIA, governments and the Board.

Following is a list of various Terra Nova public information mechanisms:

- Terra Nova Operations Phase Business Opportunities Workshop November 12, 1998
- NOIA Workshop-Consultation Sessions on the Development of the Jeanne D'Arc Basin September 30 and October 1, 1999
- NOIA Offshore Newfoundland Conferences 1998, 1999, 2000 and 2001
- NOIA "Down Under" Subsurface Seminar, November 21-22, 2000

- Terra Nova website, St. John’s Information Center, and publication “Flagship”

In addition to the above, an assessment of the procurement experience for topsides equipment and bulk materials was concluded by Board staff and shared with governments and NOIA for future consideration and planning purposes.

Recommendation 20 The Panel recommends that, should deviations from the principle of first consideration for Newfoundland workers be deemed necessary, the Proponents, with the full knowledge of the concerned worker representatives, be required to seek written authorization from the Board.

Decision 97.02 Response The Board will monitor the participation of Canadians and Newfoundland residents in all phases of the Development and will not accept any deviations from the statutory requirement to give first consideration to residents of the Province for training and employment. [s. 3.3, p. 17]

Response Status Federal immigration authorities, supported by specific information with respect to foreign workers shared through the Board and information received independently from the Proponent and its contractors, managed these matters very closely during the construction phase of the Terra Nova Project. Board staff worked with these officials in this regard. At peak employment in February 2001, 2575 people were employed on the Terra Nova Project. 82 percent were Newfoundland residents, 8 percent were other Canadian residents, and 10 percent were foreign residents.

Recommendation 21 The Panel recommends that a work week of 40 hours and maximum levels for overtime of 10 hours per week be established by the Board as the norm for the Terra Nova Development.

Decision 97.02 Response Hours of work are governed by the provincial *Labour Standards Act*, which is administered by the province’s Department of Environment and Labour. [Appendix C, s.2, p.70]

Response Status This recommendation referred to work hours at the construction site, which are governed by the *Labour Standards Act*.

Recommendation 22 The Panel recommends that the Proponents be required to institute an appropriate system for providing regular information to the public, not only regarding job and business opportunities, but also regarding the extent to which it is adhering to all commitments made in the context of its benefits plan.

Decision 97.02 Response The Board notes the Proponent’s stated intention to institute a public information campaign and will work with the Proponent to ensure such plans

provide for dissemination of information on its adherence to Benefits Plan commitments as well as on job and business opportunities.[s.3.3, p. 17]

Response Status The Proponent's actions with respect to sharing information with the public through the construction phase of the Terra Nova Project have been very extensive. These efforts included:

- Business Opportunity Workshops and Information Sessions in 1997
- Major project update sessions at NOIA Conference in 98-99-00-01
- NOIA supplier workshop November 98
- NOIA major contractors consultation session
- Information Centre in Scotia Centre
- Terra Nova website
- Terra Nova newspaper
- Numerous advertisements

Recommendation 23 The Panel recommends that the Board commence a regular public information program to update the people of the Province on the results of its compliance monitoring efforts and other matters of interest to the public concerning activities of the offshore oil industry.

Decision 97.02 Response. Accept Intent. The Board has a program by which it regularly releases information to the public and will continue to improve its communications with the public concerning the activities of the Board and the offshore oil industry generally.[Appendix C, s. 2, p. 70]

Response Status The Board reviewed its public relations policies and confirmed its values of openness, accessibility, transparency and accountability. It engaged a public information coordinator and created, expanded and improved a website. See also the response to Recommendation 4.

Recommendation 24 The Panel recommends that the Government of Newfoundland and Labrador improve its public information efforts concerning the offshore oil industry, in particular by releasing full information concerning any changes in existing petroleum policies or the adoption of new ones, together with clear explanations of policies in place.

Decision 97.02 Response This recommendation is directed to the Government of Newfoundland and Labrador.[Appendix C, s.2, p.70]

Response Status The Government undertook to make improvements. To this end it meets regularly with industry associations such as CAPP and NOIA; participates in major oil shows and conferences; announces changes in government policy on a timely basis; has full consultation with stakeholders on policy changes; and maintains a website.

Recommendation 25 The Panel recommends that the Proponents, their contractors and subcontractors be required to honour any statutory obligations respecting the licensing of professionals who work in the Province of Newfoundland.

Decision 97.02 Response The Board supports the thrust of this recommendation and will continue to encourage the Proponent's compliance with legislation governing the licensing of professionals.[3.3, p. 17] Various provincial *Acts* require the licensing of individuals engaging in certain professions within the province. These *Acts* are administered by the various professional bodies involved. The Board will encourage the Proponent to cause all individuals in these professions who are working on the project and who are located in the Province to be licensed in accordance with these *Acts*. [Appendix C, s.2, p.70]

Response Status Proponents, contractors and subcontractors must comply with the law in this regard.

Recommendation 26 The Panel recommends that the Proponents use their best efforts to promote supplier development throughout the Province.

Decision 97.02 Response With respect to the Panel's recommendations related to supplier development, technology transfer and industrial development generally, the Board accepts that these objectives are important for the Province as a long-term development strategy. In administering the requirements of the Accord Acts, the Board will work cooperatively with the Proponent and Governments to ensure that opportunities for the transfer of technology to the Province and for the development of suppliers are identified. The Board is confident that the Terra Nova Development presents significant opportunities for the transfer of technology and for advancing the development of local suppliers working in the offshore industry. The Board has established a condition to its approval to effect the identification of such opportunities-**Condition 4: Upon Project Sanction, the Proponent submit for the Board's view, a listing and description to be updated quarterly of all significant contracts for the procurement of goods and services identifying those which, in the Proponent's view, could potentially offer long-term benefits opportunities to Canada, and in particular, to Newfoundland.** [s. 3.4.3, p. 22]

Response Status The Proponent's actions with respect to its efforts in the pre-qualification process, conduct of workshops and seminars, advertising programs and public statements are consistent with this recommendation.

The Proponent's response to Condition #4 was approved and the Proponent has complied.

Following is a list of various Terra Nova public information mechanisms:

- Terra Nova Operations Phase Business Opportunities Workshop November 12, 1998

- NOIA Workshop-Consultation Sessions on the Development of the Jeanne D’Arc Basin September 30 and October 1, 1999
- NOIA Offshore Newfoundland Conferences 1998, 1999, 2000 and 2001
- NOIA “Down Under” Subsurface Seminar, November 21-22, 2000
- Terra Nova website, St. John’s Information Center, and publication “Flagship”

Recommendation 27 The Panel recommends that the Board ensure that Newfoundland content in the Project is maximized and that such content includes technology transfer and support for existing and new industries in the service sector.

Decision 97.02 Response Same as Recommendation 26 above.

Response Status The Board ensured throughout the construction phase that there was compliance with the Benefits Plan and will continue to do so during the operations phase. Content calculated at the end of construction amounted to thirty seven percent Canadian, including twenty seven percent Newfoundland & Labrador.

Recommendation 28 The Panel recommends that the Board develop a plan to ensure that technology transfer and new industrial development become a prime requisite for the approval of future oil development projects.

Decision 97.02 Response Same as Recommendation 26 above.

Response Status Both the Board and governments support technology transfer and new industrial development. Both governments have dedicated agencies for this purpose. In this context, the Board works on a continuous basis with the agencies to develop and support initiatives designed to facilitate technology transfer and industrial/commercial development associated with all offshore activities. Furthermore, the Board’s Development Application Guidelines require a proponent to describe its plans concerning transfer of technology and “know-how” to Newfoundland and other Canadian suppliers and contractors. Operators’ reports describing their activities in support of technology transfer and industrial development are submitted to the Board and shared with governments.

Recommendation 29 The Panel recommends that, while the Government of Newfoundland and Labrador may decide to renew the funding for the Bull Arm Area Coordinating Committee, the Terra Nova Development should not be considered as a reason for such renewal.

Decision 97.02 Response This recommendation is directed to the Government of Newfoundland and Labrador. [**Appendix C, s.2, p.71**]

Response Status Matters pertaining to the Bull Arm site remain under the jurisdiction of the provincial government.

Recommendation 30 The Panel recommends that administration of the Bull Arm site remain under the jurisdiction of the Department of Industry, Trade and Technology. This recommendation is directed to the Government of Newfoundland and Labrador.

Decision 97.02 Response This recommendation is directed to the Government of Newfoundland and Labrador [**Appendix C, s.2, p.71**]

Response Status The site remains under the jurisdiction of the provincial government.

Recommendation 31 The Panel recommends that the safety plans for the Project be released to the public for information and that the Board allow sufficient time for receipt and consideration of public comment before proceeding to approval. For future projects, the Panel recommends that the safety plan be a required element of the environmental impact statement.

Decision 97.02 Response The Proponent, in its *Development Plan – Part I*, provides an outline of the Safety Plan.

The *Newfoundland Offshore Petroleum Production and Conservation Regulations* require that a Safety Plan must be approved by the Board and a Certificate of Fitness issued by a recognized Certifying Authority before the Board authorizes an operator to begin oil production. The development of a Safety Plan commences with the safety studies conducted during detailed design and proceeds as the Proponent develops policies and procedures, selects equipment and defines personnel responsibilities to manage and reduce the level of risk associated with the Project. The Safety Plan must provide for a comprehensive systematic approach to safety management, and be continually updated during the life of the project. All of the information that is required to be included in the Safety Plan is not available at the time of the submission of the Development Application. Hence, only a general philosophy for the Safety Plan can be presented at the time a development plan is submitted. The Safety Plan is available for public review and comment and can be modified at any time to take into account relevant contributions from public commentators. The Board will ensure that any comment offered is evaluated and, where appropriate, taken into account in the Plan. [**s.4.3.3.3, p. 44**]

Response Status As mentioned in the Board's Decision 97.02 response, the Terra Nova Safety Plan is indeed a public document. It is available for examination at the C-NOPB library, TD Place, St. John's. Any comments offered on the plan will receive appropriate consideration.

In addition, a recent initiative of the Board is to ensure that safety plans are reviewed by the joint Occupational Health and Safety Committees onboard the installation and that

any comments received from the Committee are taken into account during the continuing review process for the plan.

Recommendation 32 The Panel recommends that the Board ensure that the safety plan for the Project is built upon the highest standards for materials, design and operational procedures to ensure life safety; that safe refuge areas and escape routes be designed with worst-case scenarios clearly in mind; that evacuation systems represent the best available technology; and, that workers be made partners in developing and monitoring safety procedures.

Decision 97.02 Response The Safety Plan is intended to provide a comprehensive compilation of safety-related information regarding the production installation and its operation. The Board's *Safety Plan Guidelines* suggest in Section 3 (p. 13) that the "design features and equipment that are intended to eliminate identified hazards, reduce risk or mitigate consequences" be included in the plan and that "it should also describe ... provisions aimed specifically at the safety of personnel such as the temporary safe refuge, escape routes, lifesaving appliances, evacuation and rescue systems". Studies that evaluate the safety of these systems, and that demonstrate that risk to personnel has been reduced to a level that is as low as reasonably practical, will be reviewed as part of the Safety Plan approval process. The Certifying Authority will also review safety studies and will monitor the "close out" of recommendations arising from these studies. [s. 4.3.3.3, p. 44-45]

Response Status The Board continues to place great emphasis on ensuring that the safety plan adequately addresses the issues raised in Recommendation 32 of the Terra Nova Review Panel. A very comprehensive assessment of the safety plan is undertaken by the C-NOPB prior to authorizing production operations. Ongoing compliance with the safety plan is verified by C-NOPB safety officers during subsequent audits of the Operator.

The Safety Plan is a living document that is subject to revisions. These revisions are, in turn, subject to approval by the Board. In certain cases, a new Plan may be required.

Recommendation 33 The Panel recommends that the Terra Nova Development should become, in collaboration with the Atmospheric Environmental Service of Environment Canada and the Hibernia platform, an important centre for the collection of weather data both to enlarge and improve current data sets and to aid in the early identification of intense winter storms; and, that a collaborative weather program with a research component be designed and implemented to improve observational techniques and operational forecasting.

Decision 97.02 Response The Board notes that operators of offshore exploration and production installations are required by the *Newfoundland Offshore Petroleum Drilling Regulations* and the *Newfoundland Offshore Area Petroleum Production and Conservation Regulations* to monitor and record weather data. These data are transmitted

to Environment Canada on a timely and routine basis. Operators are also required to acquire site-specific weather forecasts for drilling and production sites. Past operators have been willing to accommodate the field components of weather research programs in their data acquisition activities provided this did not unreasonably interfere with or jeopardize their operations. The Board will encourage the Proponent and future proponents to continue the practice of accommodating weather research instrumentation on their platforms provided this does not unreasonably interfere with or jeopardize their operations. [s. 4.3.3.8, p. 47]

Response Status The requirement to collect weather data continues unchanged. Representatives of East Coast operators and of the offshore Boards now participate in identifying priority research areas and reviewing research proposals relating to the offshore physical environment, as members of an “offshore environmental factors” advisory committee under the reorganized federal Program on Energy Research and Development (PERD).

Recommendation 34 The Panel recommends that the development plan should include a program devised in consultation with the Canadian Coast Guard and other appropriate authorities for monitoring and controlling marine traffic and for the development of a set of protocols to obviate the danger of collision.

Decision 97.02 Response The Board notes that a safety zone for the production installation is prescribed by the *Newfoundland Offshore Area Petroleum Production and Conservation Regulations*, and that the *Newfoundland Offshore Petroleum Installations Regulations* require that installations be fitted with navigation lights and sound signal systems which comply with the *Canada Shipping Act, Collision Regulations*. The *Newfoundland Offshore Area Petroleum Production and Conservation Regulations* require that an operator of a production installation submit for the Board’s approval a Safety Plan that must include a description of the facilities and procedures in place to track ice and vessel traffic and provide a staged response designed to avoid or mitigate the consequences of a collision. A “collision avoidance plan” is a standard requirement for drilling and production activities carried out under the Board’s administration. [s. 4.3.3.6, p. 46]

Response Status The safety zone for the Terra Nova FPSO has been established in consultation with the Canadian Coast Guard and the C-NOPB. Monitoring of marine traffic will be carried out in accordance with Terra Nova’s collision avoidance plans and procedures.

Recommendation 35 The Panel recommends that measures proposed by the Proponents to ameliorate spray icing or icing from freezing rain should be coupled with a research program designed to expand current knowledge and to refine existing models with the objective of establishing completely reliable design load estimates for the extreme conditions that may be encountered in the Terra Nova Development area.

Decision 97.02 Response The Board notes that research programs on spray icing and freezing rain icing have been funded in the past under the federal Panel on Energy Research and Development. The Board observes that the development of design load criteria in this area is hindered by the difficulty in calibrating present icing models using the scarce and simplified observational data which are presently available. The Board agrees that ongoing research in this area is required.

The Board will encourage the Proponent to incorporate in its weather monitoring program any measurements which are reasonable and practical and which will aid in research into the phenomenon of ice accumulation on structures. [s. 4.3.1.3 (ii), p. 41]

Response Status A PERD-funded research program involving a prototype sensor designed to measure icing loads on a fixed steel platform concluded in the late 1990s.

No new icing measurement techniques have been identified to date by the Board's advisory departments or the research community.

Recommendation 36 The Panel recommends that the Proponents, in collaboration with Environment Canada and other relevant institutions, collect data and regularly update wave hindcast data bases.

Decision 97.02 Response The Board also notes that the operator is required by the *Newfoundland Offshore Area Petroleum Production and Conservation Regulations* to collect wave and other oceanographic data. These data are provided to the Marine Environmental Data Service of the Department of Fisheries and Oceans and are used, in conjunction with other offshore measurements, by Environment Canada in updating the comprehensive PERD-funded East Coast wave hindcast data base. [s. 4.3.3.8, p.48]

Response Status The requirement to collect sea state data continues unchanged.

PERD-sponsored studies continue to update and re-evaluate the east coast wave hindcast data base and this is likely to remain a priority topic for the foreseeable future.

Recommendation 37 The Panel recommends that the Board ensure that design criteria for vessels that will be on site for two decades or more must clearly recognize the possibility of extreme wave values higher than those predicted by the current model.

Decision 97.02 Response The Board notes that CAN/CSA S471-92 requires that during the development of design parameters, a factor be applied to the calculated design loads to take into account the variability of these loads and load patterns, as well as any uncertainties which are inherent in the analysis of their effects. . .

In this regard, the Board notes that wind, wave and current criteria which are proposed for the design of the Terra Nova facilities are consistent with, and in some cases more conservative than, independent estimates of those values of which the Board is aware. [s. 4.3.1.3 (ii), p. 40]

Response Status As is stated in *Decision 97-02*, the existing design codes account for uncertainty in basic design parameters such as wave height.

In the event design wave parameters for the Grand Banks change during the life of the Project, the continuing adequacy of the Project design will be re-assessed accordingly.

Recommendation 38 The Panel recommends that the Proponents be required to maintain a continuous surface current monitoring program at the Terra Nova site to enhance the predictability of oil dispersal patterns. The Panel further recommends that serious consideration be given to the incorporation of the data from the monitoring exercise with drift modeling.

Decision 97.02 Response Operators of production installations also are required by the *Newfoundland Offshore Area Petroleum Production and Conservation Regulations* to have an oceanographic monitoring program in place which includes the measurement of surface currents. Data from these programs are made available on a yearly basis to the Marine Environmental Data Service of Fisheries and Oceans for archival purposes. These data are also available on the installation in real time for operational use. Oil spill trajectory models which are used in support of spill response operations are able to incorporate the real-time data from these measurement programs. [s. 4.3.3.8, p. 48]

Response Status The FPSO is equipped with wave radar that can measure currents. Currently this equipment is being calibrated.

Recommendation 39 The Panel recommends that the ice management plan should:

- a) allow for the difficulties in forecasting iceberg trajectories and provide for the acquisition of adequate real-time data that can add a substantial pragmatic element to model-driven projections;
- b) clearly indicate a process for selecting the icebergs to be managed by towing, for example, when multiple icebergs are in the immediate area;
- c) recognize that collisions with small growlers and bergy bits are definite hazards to shipping;
- d) include a process for timely identification and management of threatening growlers;
- e) recognize the potential for a substantial increase in the number of icebergs crossing the 48th parallel as a concomitant of global warming;
- f) include provision for a third-party audit of its effectiveness;

- g) clearly establish a set of protocols that will determine the conditions which will dictate disconnection and removal of all surface vessels to a safe area; and,
- h) include a continuous program of observation and research that leads to the improvement of radar and other remote sensing devices that will make possible the early detection of even low-lying masses of floating ice.

Decision 97.02 Response The Board notes that the preparation and submission of ice management plans have routinely been required of operators of drilling or production installations in areas prone to ice encroachment. The Board monitors operators' implementation of these plans on a continuous basis when ice is present, as part of its ongoing monitoring of offshore operations. Because of the perceived inaccuracies of iceberg trajectory forecast models, these plans have incorporated ice avoidance procedures for installations and decision-making strategies for ice deflection, both of which have been based almost exclusively upon real-time iceberg observations. These procedures include protocols for assigning priorities to response actions, and therefore are sufficiently robust to cope with the presence of multiple pieces of potentially hazardous ice.

The acceptability of the ice management plan for the Project will be examined by the Board during its review of the Safety Plan which the operator is required to submit for approval pursuant to the *Newfoundland Offshore Area Petroleum Production and Conservation Regulations*.

The Board will ensure that the ice management plan explicitly identifies the ice conditions in which the drilling and production installations are designed to operate, and the conditions in which disconnection of each installation and avoidance of ice is required. The Board expects that the Proponent's plan will include the provision of both enhanced ice detection equipment and carefully-designed surveillance procedures which will ensure that adverse ice conditions are detected in time to permit an orderly withdrawal of each installation from site. The Board also will ensure that the functional specifications for support vessels take into account the ice conditions in which these vessels are intended to operate. The Board will assess the effectiveness of the ice management plan as part of its regular monitoring of offshore operations.

Finally, the Board notes that the ice information which is acquired by the operator during the course of its ice management activities is submitted periodically to the Board, whereupon it is transmitted to the Marine Environmental Data Service of the Department of Fisheries and Oceans and to Environment Canada for archiving. Subsequently, the data are available to researchers and to members of the general public. [s. 4.3.3.7, p. 47]

Response Status The ice management plan for Terra Nova was reviewed in accordance with the commitments stated in *Decision 97-02* and is in place.

The standby vessels are ice strengthened, equivalent to DNV ice class 1C and the functional specifications for those vessels were accepted by the Board.

Recommendation 40 The Panel recommends that ship designs for the Project clearly recognize the hazard to hull integrity posed by growlers and bergy bits and meet the highest standards for navigation in ice as presented by the appropriate authorities.

Decision 97.02 Response The Board will require that the design criteria for glacial ice impact with the FPSO vessel be examined in detail by the Certifying Authority during its review of the design of the vessel, with particular attention to the detail of the methods used to calculate the probability of an iceberg incursion and the assumptions or calculations used in assessing the probability of detection of smaller pieces of glacial ice. For its part, the Board will examine this element of the CA's work closely during its monitoring of the CA's activities. [s. 4.3.1.3 (iv), p. 42]

The standby vessels must meet the requirements of the *Standards Respecting Standby Vessels*. In addition to the general requirements of the *Standards*, the standby vessels should be designed for the specific duties envisioned for the chosen installation and be compatible with the evacuation systems and procedures to be employed on the installation. The vessel design must also consider the environment, particularly the sea ice and icing conditions in which the vessels will be required to operate. Features such as the propulsion and station keeping systems, the number of fast rescue craft and other types of rescue equipment, and the nature and size of first-aid facilities to be provided should be carefully considered. Consideration also should be given to the configuration of the support vessel fleet.

Condition 18 of the Board's approval states that: The proponent obtain the approval of the Board for the configuration of the support vessel fleet and for the functional specifications for its proposed standby vessels prior to contracting these vessels.[s. 4.3.3.5, p. 46]

Shuttle tankers are outside the authority of the Board and are regulated by Transport Canada.

Response Status The Terra Nova FPSO is designed to withstand the impact of icebergs that may escape detection (100,000t). The ice strengthening for the FPSO was based on analytical and model studies and information from field iceberg impact studies. The ice design criteria was reviewed and found acceptable by Lloyd's, the certifying authority for the Terra Nova Project.

The Terra Nova FPSO will disconnect and move away when ice threatens the FPSO. Any disconnect tests will be witnessed by Lloyd's and C-NOPB.

The standby vessels are ice strengthened, equivalent to DNV ice class 1C and the functional specifications for those vessels were accepted by the Board.

Recommendation 41 The Panel recommends that all marine crews be properly trained and certified in safety and marine emergency procedures and that the Proponents make appropriate arrangements with relevant establishments in the Province for such training.

Decision 97.02 Response It is a condition of the Board’s approval that: **(Condition 17) No later than one year prior to the scheduled installation of the FPSO vessel on location, the Proponent submit the Training Proposal required by the Newfoundland Offshore Area Petroleum Production and Conservation Regulations for the approval of the Board’s Chief Safety Officer. [s 4.3.3.4, p.45]**

The *Newfoundland Offshore Area Petroleum Production and Conservation Regulations* require that the Proponent submit for the Board’s approval a Training Proposal consisting of a description of the training, qualifications and competencies of all individuals to be employed at its production facility, including individuals on support craft, along with a description of how the training will be provided and their competencies established.

The *Petroleum Occupational Safety and Health Regulations – Newfoundland* require all offshore personnel to be instructed and trained in the procedures to be followed by each employee in the event of an emergency; and to be informed of the location, use and operation of emergency and fire protection equipment.

The Board will audit the design of the Proponent’s training program and its implementation for compliance with the above requirements and will consult its advisory departments and agencies which have interests and expertise in this area respecting the design of its audit program.

Shuttle tankers are outside the authority of the Board and are regulated by Transport Canada. [s. 4.3.3.4, p. 45]

Response Status In accordance with Condition 17 of the Board’s Decision Report and as required by the *Newfoundland Offshore Area Petroleum Production and Conservation Regulations* Petro-Canada has submitted a Training Plan, which includes provisions for the training of the marine crew. All members of the marine crew are certified as per Transport Canada requirements and all have the requisite “tanker” endorsements. Petro-Canada has, in cooperation with the Marine Institute and various vendors and suppliers, completed a comprehensive suite of training for marine & other FPSO personnel. This includes areas such as command and control, dynamic positioning, tanker related training, ballast control and cargo loading, GMDSS, etc.

In addition to Transport Canada requirements, FPSO marine personnel have completed safety and emergency response training as outlined in *The Canadian East Coast Offshore Petroleum Industry Training & Qualifications Guidelines*.

The Board has reviewed and accepted Petro Canada’s Terra Nova Training Plan and has completed an audit of the plan’s implementation and compliance with the training and qualification guidelines.

Recommendation 42 The Panel recommends that operational planning should allow for the simultaneous occurrence of two or more 100-year events, involving combinations of wind, sea, and ice. This should include a well-designed and clearly understood decision-making process for the timely removal of the production vessel and all other vessels from the area.

Decision 97.02 Response The Board notes that CAN/CSA S471-92 requires that during the development of design parameters, a factor be applied to the calculated design loads to take into account the variability of these loads and load patterns, as well as any uncertainties which are inherent in the analysis of their effects.

The Standard also requires that, when determining these loads, the simultaneous occurrence of environmental processes be taken into account. The manner in which this is done depends upon whether one environmental process is dependent on, independent of, or exclusive of another. For example, the Standard suggests that waves and wind-driven current are dependent upon wind, whereas tidal currents are not. Limiting environmental criteria for operations are reviewed by the Certifying Authority. [s. 4.3.1.3, p. 40]

Response Status The environmental criteria for the Terra Nova project was approved by Lloyd's, the certifying authority for the Terra Nova project. Lloyd's reviewed the Terra Nova environmental criteria against the guidance given in the Canadian Standards Association Standard CAN/CSA S471-92 entitled General Requirements, Design Criteria, the Environment and Loads.

The Lloyd's scope of work for the certification of the Terra Nova installation that identified their review of environmental data was approved by the Chief Safety Officer on December 22, 1998.

Recommendation 43 The Panel recommends 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. A mechanism for the formal and continuous consultation between the captain and the offshore installations manager should be clearly in place. The marine captain should be the one to implement, when it is necessary, the protocols to disconnect the vessel and remove it to a safe area.

Decision 97.02 Response The *Canada-Newfoundland Atlantic Accord Implementation Act* requires, at Section 193.2(1), that the operator put in command of the installation a manager who "meets any prescribed qualifications" and is responsible for the safety of the installation and its personnel. In addition, the *Newfoundland Offshore Area Petroleum Production and Conservation Regulations* require, at Section 51(1)(f), that the Safety Plan for the Project include "a description of the command structure on the installation, and for the operator's shore base and the relationship to each other." The Board will review the qualifications of the installation manager, the command structure on the FPSO and the procedures put in place for transfer of authority between the installation manager

and the senior marine person (if they are not the same person) prior to approving the Safety Plan. [s. 4.3.3.4, p. 45]

Response Status The Board has reviewed the command structure on the FPSO and the training and qualifications of the Installation Manager and senior marine personnel. The command structure provides for close consultation between the Installation Manager and Vessel Lead (Marine Captain) in both routine and emergency situations. The Board is satisfied that the command structure is appropriate to deal with the risks presented by the physical environment and those presented by the processing and storage of hydrocarbons on the FPSO.

In any situation where it is necessary for the FPSO to disconnect from its mooring, the command will switch from the Installation Manager to the Vessel Lead. This change in command will be completed prior to commencing the disconnect sequence as detailed in the transfer of command protocol in the approved Terra Nova Safety Plan and Emergency Response Plan.

Recommendation 44 The Panel recommends that the Board undertake a new, thorough, immediate review of the adequacy of present regulations on discharges. The review should take full account of monitoring and management experiences in other offshore petroleum areas, and should proceed on the basis of a precautionary approach that considers the impact of specific projects and cumulative effects as well.

Decision 97.02 Response. Accept. A re-examination of the discharge levels and practices recommended in the *1996 Offshore Waste Treatment Guidelines* (OWTG), in consultation with other Canadian regulatory agencies will be undertaken by the Board. As a matter of course, the Board periodically reviews and considers experience in other jurisdictions when evaluating the adequacy of regulated discharge levels. The review of the Guidelines will take into account the precautionary principle, recent advances in waste treatment technologies for offshore oil exploration and development, and the results of cumulative effects monitoring. [Appendix C, s. 4, p. 71]

Response Status The review of the 1996 OWTG was announced by the three Canadian regulatory Boards in November 1999. In 2000, a multi-stakeholder working group chaired by C-NOPB began undertaking the review described. A draft revision to the Guidelines has been prepared by the working group and *is expected to be released for wider public comment in 2002.*

Following close of the public comment period the working group will prepare final revisions and provide the results to the Boards for consideration.

Recommendation 45 The Panel recommends that, if regulations, standards and/or guidelines are updated over the life of the Terra Nova Development, the new requirements should be applied to the Project. Flexibility in the Project's design is required to allow for

retrofitting during the life of the Project in order to comply with updated requirements. Use of facilities that do not incorporate retrofitting provisions in the initial design should not be permitted on the Grand Banks.

Decision 97.02 Response The Board notes that existing projects or installations are subject to the most recent regulatory instruments. Therefore, any changes to regulatory standards which take place during the life of the Terra Nova field will apply to the Project. As a matter of policy, the Board encourages operators to make provisions in their designs to accommodate changes in technology, where such changes are anticipated, and where potential advances in practicable treatment technology can be reasonably foreseen. This will be done in the Terra Nova case. [s. 4.4.1.1, p. 48]

Response Status Retrofitting occurred on the Hibernia Platform in order to accommodate cuttings re-injection. New shale shakers were also installed for better compliance with the Offshore Waste Treatment Guidelines.

As Terra Nova proceeds, the need for retrofitting will be assessed.

Recommendation 46 The Panel recommends that the Board convene in the near future, a workshop of recognized experts to examine the potential for cumulative impacts in the Newfoundland offshore due to petroleum development and other activities, and to develop best-science approaches to monitoring them.

Decision 97.02 Response The Board observes that the difficulties associated with the proper scientific assessment of cumulative effects are not limited or unique to the Grand Banks, nor for that matter to petroleum-related activity. The Board believes that experience which is gained in other applications and jurisdictions will assist the Board, its advisory agencies, and Proponent in developing techniques which are appropriate for the particular case of the Grand Banks.

The Board believes that the time is right for an examination of the topic, with particular application to present and potential future petroleum developments on the Grand Banks.

The Board will propose a study which will incorporate a workshop similar to that recommended by the Panel through the Environmental Studies Research Fund to examine experience elsewhere in the area of cumulative effects assessment and to evaluate the applicability of this experience to the Grand Banks in light of actual environmental conditions and realistic development scenarios. The objectives of the study will include the provision of recommendations for “best-science” approaches to cumulative effects monitoring, and a consideration of appropriate criteria for determining the “significance” of environmental effects. The Board will ensure that effects monitoring programs of present and future petroleum producers on the Grand Banks are consistent with any scientifically credible principles or criteria devised. [s. 4.4.5, p. 58]

Response Status The Board proposed the study to the ESRF Management Board in mid-1998, and the Management Board accepted it for funding.

The workshop was held in St. John's May 8-9, 2000. Sixty-five representatives of the oil and gas industry, federal and provincial governments, fishing industry, researchers and non-governmental organizations participated. The workshop provided an opportunity for stakeholders to discuss approaches to cumulative effects assessment and monitoring, and to transfer and adapt knowledge developed in western Canada and other offshore oil and gas producing areas. The workshop report was published as ESRF Report 137, *Workshop on Cumulative Environmental Effects Assessment and Monitoring on the Grand Banks and Scotian Shelf*.

Cumulative effects assessment and monitoring continues to be a priority area of ESRF and more specific studies in this area are planned.

Recommendation 47 The Panel recommends that the Board identify the factors necessary for a cumulative effects monitoring program on the Grand Banks and design an implementation plan for such a program; and that future projects be required to incorporate measures consistent with this program into their monitoring efforts.

Decision 97.02 Response See response to Recommendation 46.

Response Status Although the workshop dealt with the matter, it remains an ongoing issue.

Recommendation 48 The Panel recommends that reviews of regulations, standards and guidelines by the Board and relevant government departments explicitly take into account cumulative impacts of all petroleum projects and other probable developments on the Grand Banks, and potential synergistic effects of other activities in the area; and that the Board advise all future proponents that it will not accept environmental impact statements that do not include a thorough and broad analysis of possible cumulative impacts.

Decision 97.02 Response The Board, when it participates in the review of regulations, standards, or guidelines, considers applicable experience in other jurisdictions (including Canadian jurisdictions where such experience exists) which indicates the potential for cumulative impacts or synergistic effects under conditions which prevail, or which are likely to prevail, in the Newfoundland Offshore Area. [s. 4.4.5, p. 59]

Response Status The requirements to consider cumulative environmental effects appear both in the *Canadian Environmental Assessment Act* and in the Board's *Development Application Guidelines*.

Recommendation 49 The Panel recommends that in the context of the workshop on cumulative effects, the Board should discuss with experts the adequacy of present criteria for significant impact and additional criteria which would be helpful in a precautionary approach to prevent environmental harm.

Decision 97.02 Response See response to Recommendation 46.

Response Status The workshop referenced in the response to Recommendation 46 did not identify additional criteria for determination of significance beyond those already identified in Canadian Environmental Assessment Agency guidance on the topic (e.g., its reference guide entitled *Determining Whether A Project is Likely to Cause Significant Adverse Environmental Effects*).

Recommendation 50 The Panel recommends that Environment Canada and the Department of Fisheries and Oceans identify specific relevant gaps in existing information pertaining to the Grand Banks which limit their ability to identify and predict typical impacts of offshore petroleum activity. This information should be made available to proponents, the Board and others. The Board must consider such information deficits when reviewing regulated standards.

Decision 97.02 Response. Accept. The Board is informed that Fisheries and Oceans and Environment Canada will review the issue of existing gaps in order to assist the proponent in developing monitoring plans and to assist the Board in its review of regulated standards. The results of the review will be available as recommended by the Panel.

The Board, on a routine basis, solicits the opinions of the federal and provincial fisheries and environment departments on these and other matters pursuant to its Memoranda of Understanding with these departments, and takes the advice provided into account during the performance of its regulatory duties.[**Appendix C, s.4, p. 71**]

Response Status Ongoing.

Recommendation 51 The Panel recommends that the Board require operators of offshore oil projects to fund basic research. This initiative should include support of the Department of Fisheries and Oceans to conduct basic research on the mechanisms and processes by which chemicals in produced water may have impacts on the biological community. Also, support for research on cumulative and sub-lethal effects should be included.

Decision 97.02 Response. Accept intent. The federal government has stated that, in accordance with the “polluter pay” principle, it will seek to have this work supported through the Environmental Studies Research Fund.

The Proponent, under its Canada-Newfoundland Benefits Plan, is required to undertake research and development expenditures. The Board will lend its support to any well-conceived program of research into the effects of offshore platform discharges. With respect to cumulative and sub-lethal effects, the results of the cumulative effects monitoring workshop described in Section 4.4.5 of this Decision Report should provide a “road map” regarding the most likely candidate topics for research funding. [**Appendix C, s. 4, p. 71**]

Response Status A multiyear research program (approx. \$700k) into produced water from eastern Canadian fields is being undertaken by Fisheries and Oceans’ scientists under funding from the Program on Energy Research and Development.

Recommendation 52 The Panel recommends that the Board ensure that monitoring data from the Terra Nova Development be subjected to full scientific peer review at regular intervals. Notification and invitation to participate in these reviews should be extended to qualified experts and the public. The reviews conducted by the Board should examine relevance of information that becomes available from basic research studies. The Board should make the data and the results of these reviews available in the public domain. The Board should also regularly present information from on-going monitoring programs and reviews to the public through effective information programs.

Decision 97.02 Response The Board . . . intends to ensure that the results of EEM are made publicly available in a prompt manner following the completion of individual survey programs. The Board notes that it routinely consults with federal and provincial environment and fisheries departments on these matters and that these working relationships are described in Memoranda of Understanding with these departments. During its consideration of environmental effects monitoring data, the Board will consult with federal and provincial fisheries and environment departments and will welcome input from external experts or other interested parties. [**s. 4.4.4.1, p. 56**]

Response Status The first Terra Nova EEM survey technical results were submitted to the Board in June 2001 and have been distributed to experts within government departments for review.

Recommendation 53 The Panel recommends that, because of accumulating data summarized in recent studies which extend the zones of local impacts, the Board ensure that the monitoring program for the Terra Nova Project extend sampling gradients beyond the limits where effects have been previously demonstrated. In the instances where these gradients overlap with potential influences from the Hibernia project, careful standardization of methodologies is necessary.

Decision 97.02 Response The Board agrees with the Panel’s recommendation that the EEM sampling grid extend sufficiently far to fully capture the “zone of influence” of Project discharges.

The Board will ensure that the sampling grid which is proposed for the Terra Nova EEM program is based upon modeling results specific to Terra Nova conditions and that these results are examined in the light of international monitoring experience. The Board will also ensure that the grid is expanded if monitoring results indicate that the zone of influence is approaching the grid boundary. [s. 4.4.4.1, p.56]

Response Status Site-specific effluent modeling was undertaken by the Terra Nova Proponent as part of the design of its EEM program. The resultant sediment-sampling grid includes sampling stations out to 8 km from the development area and control sites 20 km distant.

The first operation phase EEM survey was conducted in 2000 and the results were submitted to the C-NOPB in June 2001. The results indicate that to date the sampling grid is adequate to characterize the zone of influence.

Recommendation 54 The Panel recommends that the Proponents re-evaluate the potential for reinjection of drill cuttings as a viable disposal option for the Terra Nova Development. If reinjection is not possible, the Panel recommends that the discharge levels obtainable with best available technology for floating systems be applied to the Terra Nova Development, and that if during the life of the Project standards are developed that cannot be met at sea, the cuttings be transported to shore for safe disposal.

Decision 97.02 Response The Board will require as a condition of its approval of the Development Plan that, prior to beginning drilling operations, the Proponent submit for the Board's review a report evaluating the technical and economic feasibility of re-injecting oiled drill solids and of their transport to shore for subsequent disposition in an environmentally responsible manner.

In the event that re-injection of oiled drill solids is unfeasible, the Board is prepared to permit their discharge following treatment in accordance with established regulations, standards and guidelines. The Board notes that the *Guidelines* recommend that an operator continue to evaluate new technologies and procedures which may permit reduction of the oil content of discharged drill cuttings below the levels specified therein. It commends the Proponent's commitment during the public hearings to install state-of-the-art cuttings treatment equipment on the drilling unit which will drill its development wells, urges the Proponent to continue to evaluate technological progress in the field and expects the Proponent to adopt improved treatment methods where it is practical to do so. The Board will monitor this aspect of the Proponent's performance. [s. 4.4.1.3, p. 50]

Condition 20 of the Board's *Decision 97.02* states that:

The Proponent, prior to beginning drilling operations, submit to the Board a report evaluating the technical and economic feasibility of the re-injection of oiled drill solids and of transporting them to shore for disposition in an environmentally responsible manner.

The Proponent re-inject oiled drill cuttings if, in the opinion of the Board, the results of this evaluation indicate re-injection is technically and economically feasible. [s. 4.4.1.3, p. 50]

Response Status The Proponent provided several submissions to the Board on this topic. During its review, the Board recognized that re-injection from floating drilling units is potentially more problematic than from fixed platforms, and that much less experience has been acquired worldwide from floating units. The Board therefore permitted the discharge of treated synthetic-based drill solids for the initial period of development drilling.

Following consultation with Environment Canada and Fisheries and Oceans, and meetings with Norwegian officials on the topic of cuttings disposal, the Board subsequently completed its review of the Proponent's submissions and concluded that cuttings re-injection was not feasible. The Board also noted that recent results from monitoring programs in the North Sea indicate lesser adverse environmental effects from the discharge of cuttings from drilling operations using SBF than from the oil-based drilling fluids used previously.

Terra Nova will be subject to the provisions of the revised *Offshore Waste Treatment Guidelines* when they are finalized.

Recommendation 55 The Panel recommends that the Proponents be required to re-examine the option of reinjection of produced water. Only if they can demonstrate to the clear satisfaction of the Board that reinjection into the Terra Nova formation is not a practical or economically feasible proposition should they be permitted to proceed with discharge after treatment. In that eventuality, the Proponents should be required to meet standards that are the most stringent achievable with best available technology for floating production facilities.

Decision 97.02 Response The Board believes it to be prudent, therefore, that the capability be provided in the design of the facilities to further mitigate the effects of these discharges if the results of effects monitoring programs on the Grand Banks, or relevant experience in other jurisdictions, indicate that such measures are appropriate. Such capability should include the allocation of sufficient space and motive power for additional water treatment facilities and for injection pumps.

Finally, the Board observes that, notwithstanding the Proponent's statements at the public hearings respecting the technical and economic feasibility of re-injecting produced water, it has not as yet provided any technical documentation specific to the Terra Nova field to substantiate its assertion. The Board believes that the technical feasibility of produced water re-injection into the reservoir will not become clear until sufficient water has been produced from the field to permit its properties to be analyzed. [s. 4.4.1.4, p. 50]

Condition 21 of the Board's *Decision 97.02* states that:

- (i) The Proponent provide in the design of its facilities for the re-injection of produced water, should this be required in the future.**
- (ii) The Proponent undertake and submit to the Board an analysis of the feasibility of produced water re-injection, following the recovery of sufficient volumes of produced water to permit the conduct of such an analysis.**
- (iii) The Proponent proceed with re-injection of produced water if, in the opinion of the Board, it is technically and economically feasible. [s. 4.4.1.4, p. 51]**

Response Status The Proponent provided a submission respecting Condition 21 (i) in April, 1998. The Board determined that sufficient provision for re-injection had been made in the design and accepted the submission as fulfilling this portion of the Condition.

The other portions of the submission will not be satisfied until after production of water from the field.

Recommendation 56 The Panel recommends that the Board require the Proponents to submit a plan for mitigation of discharged chlorinated water that includes the use of alternatives to chlorination or of dechlorination facilities.

Decision 97.02 Response The Board will require the Proponent to evaluate and report to the Board the feasibility of using methods alternative to chlorination for the control of biological growth in the cooling water systems used on the FPSO vessel. In the event that chlorination remains the preferred method, the Board will require that the design of the production facilities provide for the minimization of chlorine use by means of an in-line analyzer near the point of discharge which controls the quantity of chlorine which is added to the cooling water, and for the use of dechlorination facilities if it is practicable to do so. The Board also will require that the Proponent investigate the feasibility of injecting cooling water into the reservoir for pressure maintenance, and if feasible to incorporate provisions for such injection into the design of its facilities. [s. 4.4.1.4, pp. 51-52]

Condition 22 of the Board's *Decision 97.02* states that:

- (i) The Proponent evaluate and report to the Board the feasibility of using methods alternative to chlorination for the control of biological growth in the cooling water systems used on the FPSO vessel.**
- (ii) In the event that chlorination remains the preferred method for control of biological growth in cooling water, the Proponent design its production facilities so that chlorine use is minimized by means of an in-line analyzer near the point of discharge which controls the quantity of chlorine which is added to the cooling water, and incorporate dechlorination facilities if it is practicable to do so.**
- (iii) The Proponent investigate the feasibility of using cooling water for re-injection, and to provide for this in the design of its facilities, if in the opinion of the Board, the evaluation indicates that this is feasible. [s. 4.4.1.4, p. 52]**

Response Status The Proponent indicated, in a submission to the Board in May, 1998, that no feasible alternatives to chlorination existed for offshore applications with water throughputs characteristic of the Terra Nova FPSO vessel. It undertook to install an inline chlorine analyzer and to utilize cooling water for re-injection. The Board, following consultation with Environment Canada, accepted the Proponent's submission as satisfying the Condition.

Recommendation 57 The Panel recommends that the Board require the Proponents to adopt a zero-tolerance policy for oil spills.

Decision 97.02 Response The Board acknowledges the risk of small batch spills occurring during the life of the project, particularly during tanker loading operations, and commends the Proponent for its stated "zero tolerance" policy toward these spills. The Board notes that the Accord Acts take a "zero tolerance" approach to oil spillage, forbidding the spillage of oil and by declining to define any "minimal acceptable" amount in this context.

[s. 4.4.2.1, p.53]

Response Status Board staff follow up on each incident of oil spillage from offshore installations, regardless of the estimated volume involved. The Proponent has cooperated with the Board's actions to date, and in addition conducts its own investigations of these incidents. This aspect of the Proponent's operation will require continued vigilance.

Recommendation 58 The Panel recommends that the Proponents implement a program of continuing education for marine crews to keep them sensitive to the ocean environment within which they are working and fully alive to the potentially disastrous consequences of even momentary failures through carelessness, complacency or incompetence.

Decision 97.02 Response The Board concurs with the Panel's opinion that environmental awareness programs should form a regular part of ongoing training programs for offshore employees. The Board will ensure that provisions for the delivery of this training included in the training package delivered to workers.

[s. 4.4.4, p. 55]

Response Status The Proponent's Environmental Protection Plan (EPP) includes provision of environmental awareness training to all offshore employees.

Recommendation 59 The Panel recommends that the Board require the Proponents, in accordance with a zero-tolerance policy for oil spills, to establish a set of protocols to determine when oil transfers are unsafe.

Decision 97.02 Response The Board expects the Proponent's EPP to explicitly describe the equipment and operating procedures it intends to employ to ensure that marine operations, such as tanker loading, are undertaken in a prudent manner. The Board intends to monitor closely the Proponent's adherence to these procedures during the production operation, to investigate fully any lapses which occur, and to apply the sanctions provided for by the Accord Acts where this is warranted. [s. 4.4.4, p. 55]

Response Status A condition of the Proponent's EPP approval calls for the provision of these procedures prior to offloading crude from the FPSO vessel.

Recommendation 60 The Panel recommends that the appropriate authorities undertake a comprehensive review of the transport of oil produced on the Grand Banks.

Decision 97.02 Response. Accept intent. The federal government has noted that the transport of oil from the Grand Banks, as well as from international markets, is a concern. The Canadian Coast Guard of the Department of Fisheries and Oceans will take necessary actions to help address this recommendation [Appendix C, s .4, p.72]

Response Status The Canadian Coast Guard is responsible for the development and refinement of standards to improve Canada's preparedness and response regime.

Recommendation 61 The Panel recommends that the Government of Newfoundland and Labrador establish a coastal zone management plan for the Avalon Peninsula and the west side of Placentia Bay.

Decision 97.02 Response. Accept. The Government of Newfoundland and Labrador has agreed with this recommendation, and in consultation with various other provincial and federal government departments will take the necessary steps to ensure that there is a coastal zone management plan for the shores of the Avalon Peninsula and the shores of Placentia Bay.

The federal government has stated that it recognizes the sensitivity of the Avalon Peninsula and the west side of Placentia Bay and that it will work with the province on any initiatives towards the integrated management of adjacent areas. [Appendix C, s. 4, p.72]

Response Status The Government of Newfoundland and Labrador established a federal-provincial working group to address this matter.

Recommendation 62 The Panel recommends that the Proponents ensure that all staff associated with the Terra Nova Development be fully informed about the procedures required for reporting all spills, whatever their size.

Decision 97.02 Response The Board notes that a contingency plan for oil spill response is a component of the Environmental Protection Plan and will ensure that this plan incorporates provisions to ensure that appropriate personnel are properly trained in their respective duties in the event of a spill and that drills and exercises are periodically held to inculcate these duties. [s. 4.4.2.1, p. 53]

Response Status The Proponent's spill response plan provides both for personnel training and the appropriate reporting procedures.

To date the Board has been notified of Terra Nova spills as small as 0.1 litre.

Recommendation 63 The Panel recommends that the relationships between relevant government departments during an oil spill response situation be reviewed and clarified so that each co-operating agency has a role that is clearly defined and clearly understood.

Decision 97.02 Response. Accept. The Board notes that the respective statutory responsibilities of the Board and various government agencies in a spill response situation are defined by legislation, regulations, memoranda of understanding, and the contingency plans of the various departments and agencies, and that the description of spill-related jurisdictions, duties and responsibilities is consistent among these documents.

Notwithstanding the above, the federal government has stated that, in keeping with its commitment to effective and efficient regulatory regimes, it will work with the Board to ensure that a review of the duties of various government agencies during a spill response will be undertaken in consultation with other necessary and relevant parties. [Appendix C, s. 4, p.72]

Response Status Pursuant to the MOU concerning the Provision of Environmental Services in the Newfoundland Offshore Area, the Board is the lead agency responsible for responding to environmental emergencies arising from oil and gas activities in the Newfoundland offshore area.

The federal departments of Environment and NRCan are parties to the above-noted MOU and work with the Board on the Newfoundland Environmental Advisory Committee, a Terms of Reference for which is appended to the MOU. The role of the Regional Environmental Emergency Team, established by Environment Canada, is also appended to the MOU.

These documents detail the relationships between the Board and other relevant agencies in the event of an oil spill. The responsibilities of each agency are also well defined. These roles, relationships and responsibilities are well understood by the operators, the Board and other relevant agencies.

Recommendation 64 The Panel recommends 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.

Decision 97.02 Response The Board notes that the predicted effects of greenhouse gases upon the atmosphere arise on a global, rather than a local or site-specific basis. Nevertheless, the Board believes that the Proponent should evaluate the potential for incorporating provisions to reduce the emission of these gases from the FPSO vessel during the design of its facilities. The Board also believes that a decision to invest in such equipment should be considered as part of a larger review which evaluates the cost-effectiveness of such an investment against a wide variety of investment alternatives to meet the Proponent's undertakings under the Government of Canada's Voluntary Challenge Program for the reduction of Greenhouse Gas emissions. [s. 4.4.1.2, p. 49]

Condition 19 of the Board's *Decision 97.02* states that:

The Proponent 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. [s. 4.4.1.2, p. 49]

Response Status In June 1998 the Proponent submitted a report to the Board that described its evaluation of greenhouse gas emissions (GHG) reduction measures for the FPSO vessel and that concluded all feasible measures had been taken to minimize greenhouse gas generation and release. Following consultation with Environment Canada the Board determined that the report satisfied the condition, but required the Proponent to re-evaluate these measures every three years following First Oil and to report the results to the Board.

Recommendation 65 The Panel recommends that the Government of Canada assume a leadership role in the international community in seeking substantial reductions in greenhouse gas emissions and take immediate action to meet, at the very least, those targets set under the United Nations Framework Convention on Climate Change.

Decision 97.02 Response Accept intent. The federal government has noted that this recommendation is actually outside the scope of this project. However, Canada and the rest of the international community have accepted that climate change poses growing challenges to the globe's environmental and economic well-being which must be addressed. This is based on the majority view of the scientific evidence to date. Accordingly, Canada is pursuing a responsible, precautionary approach in dealing with climate change through mitigative and adaptive actions. Signatories of the Framework Convention on Climate Change (FCCC) will be deciding in Kyoto, Japan, in December 1997, on legally-binding greenhouse gas emissions commitments for the post-2000 period. Canada is participating constructively in the international process with the objective of effectively coming to grips with this issue, making serious progress and meeting our global commitments[**Appendix C, s. 4, p. 72**]

Response Status The Government of Canada is an active participant in international discussions to reduce greenhouse gas emissions and has established Canada's Climate Change Voluntary Challenge and Registry Inc.

Recommendation 66 The Panel recommends that the Board require the Proponents to undertake a study of seabird attraction to, and collisions with, offshore petroleum facilities, and in this effort should seek co-operation with the Hibernia project so that early evaluation of light effects might be possible, and so that there might be opportunity to test any mitigation procedures which might be required.

Decision 97.02 Response The Board believes that, in the interests of safety, personnel complements on offshore drilling and production facilities should be kept to the minimum necessary for prudent operations and has concluded that insufficient evidence has been presented to justify requiring the placement of additional, dedicated personnel on drilling or production platforms as observers.

The Board will explore with the Hibernia Management and Development Company and with representatives of the Canadian Wildlife Service of Environment Canada whether the potential attraction of seabirds to lights on offshore platforms may be credibly investigated using existing platform personnel. The Board also will propose a literature study through the auspices of the Environmental Studies Research Fund to investigate further the level of information on this topic available worldwide. The Board will expect the Proponent to participate in these studies as appropriate and to take their results into account in the design of its facilities. [s. 4.4.4.1, p. 56]

Response Status The Board proposed a study respecting seabird monitoring from offshore installations and support vessels to the ESRF in 1998. Representatives of East Coast operators volunteered to fund the study directly and the work was conducted by researchers from Memorial University of Newfoundland and the University of New Brunswick under the oversight of the ESRF Management Board.

The work was conducted in 1999 and the report was published in early 2001 as ESRF Report 138, *Seabird Attraction to Offshore Platforms and Seabird Monitoring from Offshore Support Vessels and Other Ships (Literature Review and Monitoring Designs)*. This Report is available through the ESRF website at www.esrfunds.org.

The Proponent has undertaken seabird observations from its drilling unit, the "Henry Goodrich", and intends to do so from the FPSO vessel. The observers also implement an action plan for recovery and release of seabird following collisions.

An ESRF-supported program for monitoring seabirds from offshore supply vessels on the northern Grand Banks began in the summer of 2001.

Recommendation 67 The Panel recommends that the Board routinely require observers on the production vessel and on shuttle tankers that use transshipment facilities in Newfoundland until comfort is achieved that there will be minimal impact on seabirds on the Grand Banks or in breeding colonies along the Newfoundland coast.

Decision 97.02 Response The Board believes that, in the interests of safety, personnel complements on offshore drilling and production facilities should be kept to the minimum necessary for prudent operations and has concluded that insufficient evidence has been presented to justify requiring the placement of additional, dedicated personnel on drilling or production platforms as observers.

The Board believes, rather, that routine seabird monitoring may be better accomplished by means of placing observers on supply vessels during their regular transits as part of a regional monitoring effort. The Board notes that the Proponent expressed a willingness during the public hearings to consider making space available on its vessels for such a purpose. In consultation with the Proponent, the Hibernia Management and Development Company, the Canadian Wildlife Service of Environment Canada, and other interested parties, the Board will sponsor a project under the auspices of the Environmental Studies Research Fund to determine the feasibility of developing a scientifically defensible seabird monitoring program of this type, and if such a program is deemed feasible, to facilitate its implementation on the north-east Grand Banks. [s. 4.4.4.1, p. 56]

Response Status See response to Recommendation 66.

Recommendation 68 The Panel recommends that the Board ensure that monitoring of the abundance and activities of marine mammals, and especially of identified individuals, be conducted and be related to specific activities and attendant emitted noise of the Terra Nova Development.

Decision 97.02 Response The Board observes that no evidence was presented to the Panel to support the claim that the Proponent's estimation of the effects of noise, which were presented in the EIS with considerable reference to published literature, were inappropriate. The Board can see no reason at this time to conclude that effects of Project-related noise upon marine mammals are likely to be significant, nor to require inclusion of marine mammals in the EEM program for routine Project operations. The Board acknowledges, however, that marine mammal monitoring may be appropriate following an oil spill. The Board will ensure that the Proponent's spill response plan provides for the monitoring of potential effects upon marine mammals following a major spill. [s. 4.4.4.1, p. 56-57]

Response Status The Terra Nova Oil Spill Response Plan includes an environmental effects monitoring program for implementation following an oil spill, in whole or in part as the circumstances of each individual spill incident dictate. The program includes provisions for marine mammal surveys.

The Proponent intends to further refine its program in consultation with government and industry experts.

Recommendation 69 The Panel recommends that the Board require the Proponents, when the end of the Project approaches, to review and evaluate their plans for decommissioning and abandonment in light of new technologies and standards that are then current.

Decision 97.02 Response The Board believes that the Proponent's plans for decommissioning the FPSO vessel are acceptable and notes that, under the requirements of the *Newfoundland Offshore Area Petroleum Production and Conservation Regulations*, approval of the Board is required at the commencement of decommissioning. [s. 4.4.3.1, p. 53]

The Board . . . notes that pursuant to the *Newfoundland Offshore Petroleum Production and Conservation Regulations* the specific approval of the Board is required prior to the final abandonment of each well.

The Board also acknowledges the Proponent's commitment to remove all subsea facilities which are located on or above the sea floor.

The Board agrees that the proposed purging and abandonment in place of trenched flowlines likely will not result in significant adverse effects upon the natural environment nor interfere with other users of the seabed. The Board also agrees that a further assessment of this matter should be performed at the time of abandonment, in consideration of regulations and national policies which may exist at that time.

The Board notes that the Proponent will be required pursuant to the Accord Acts to seek the Board's approval prior to abandoning any subsea equipment in place on or below the sea floor. [s. 4.4.3.2, p. 54]

Response Status No action required at this time.

Pursuant to the Financial Responsibility Guidelines, the Board requires evidence of financial responsibility to be approved respecting the authorization of any work or activity relating to the decommissioning of a production installation.

Recommendation 70 The Panel recommends that the Board apply the polluter pays principle even after the Project ends provided that harmful effects can be linked unequivocally to the Project.

Decision 97.02 Response The Accord Acts address the question of the limitation period as follows:

Proceedings in respect of claims ... may be instituted within three years after the day when the loss, damage, costs or expenses occurred but in no case after six

*years after the day the spill or the discharge, emission or escape of petroleum occurred or, in the case of debris, after the day the installation or structure in question was abandoned or the material in question broke away or was jettisoned or displaced.*¹

Because of the statutory time limitation (6 years maximum) respecting claims arising from a ‘spill’ or ‘debris’, the Board cannot apply the ‘polluter pays’ principle in perpetuity. [s. 4.4.3.2, p. 54]

Response Status The Board will implement the intent of the Recommendation under the limitations imposed by the Accord Acts as they exist at the time.

Recommendation 71 The Panel recommends that the Board convene a workshop to identify critical monitoring program details, including baseline studies, and to review the final proposed program before it is approved by the Board.

Decision 97.02 Response The Board believes that the design process for the EEM program should include provision for input and review by outside experts and by interested groups or individuals in the general public, and intends to ensure that the results of EEM are made publicly available in a prompt manner following the completion of individual survey programs. The Board notes that it routinely consults with federal and provincial environment and fisheries departments on these matters and that these working relationships are described in Memoranda of Understanding with these departments . . . [s. 4.4.4.1, p. 56]

Condition 23 (ii) of the Board’s *Decision 97.02* states that:

The Proponent provide, during the design of its environmental effects monitoring program, opportunity for the general public to obtain input into, and review, the design. [s. 4.4.4.1, p. 57]

Response Status The Proponent solicited public input during the design of its EEM program in 1998 by means of a public information session in St. John’s following its completion of a draft design for discussion. It continued to accept written comments on its draft program following the session. It also consulted with experts within the departments of Fisheries and Oceans and Environment Canada, and other Canadian and international experts, during preparation of its design.

The EEM program was submitted to the Board in November 1998 and the first operations phase survey was conducted in 2000, the first full year of development drilling on the field. The results of this survey were submitted in June 2001.

¹ Canada-Newfoundland Atlantic Accord Implementation Act, Section 162(5) and Canada-Newfoundland Atlantic Accord Implementation Newfoundland Act, Section 155(5)

Recommendation 72 The Panel recommends that the Board urge the Proponents to seek a synergistic relationship with the Hibernia project to the end of devising the best possible monitoring programs.

Decision 97.02 Response The Board believes that the Panel's suggestion that the Proponent, during development of its EEM program, seek synergies with the Hibernia project is a sensible one, and will encourage the Proponent to do so during the EEM design process. [s. 4.4.4.1, p. 57]

Response Status Information from the Hibernia EEM program design and its initial survey results were considered in the development of the Terra Nova design and the latter program incorporates many of the same elements as that of Hibernia.

The two operators have continued to consult and communicate as their respective operations phase surveys progress.

Recommendation 73 The Panel recommends that the Board use every reasonable opportunity, including the provision of funding as appropriate, to promote collaborative research among the Proponents, other petroleum projects, and university and government researchers.

Decision 97.02 Response The Board notes that its budget does not include provision for the direct funding of general research. However, it participates in setting the priorities of the federal Panel on Energy Research and Development and provides a representative to the Management Board of the Environmental Studies Research Fund. The Board will use its good offices in these fora and in its relations with the petroleum industry to encourage the collaboration which the Board describes. [s. 4.4.4.1, p. 57]

Response Status The Board continues to participate in the activities of PERD and of ESRF and continues to encourage synergies and cooperation where possible. Examples of collaborative research projects include: 1. The PERD funded research program on drilling wastes and 2. The ESRF Seabird Study (referenced at Recommendation 66) which included university researchers on industry vessels.

Recommendation 74 The Panel recommends that the Board ensure that preparations to evaluate the effects of oil spills be done in advance of actual events.

Planning should include preparedness to release drifters in the area of the spill and to provide for their collection at sea and on beaches. In the event of a spill, evaluation of the impact must begin with dispersal of drifters and the careful collection of all oiled seabirds and drifters in the area of the spill and on beaches.

Decision 97.02 Response The Board believes that thorough advance planning for monitoring effects of an oil spill is a necessary precaution and will ensure that this is

addressed in the Proponent's contingency plans. The Board notes, however, that the level of detail captured by the monitoring plans established for routine discharges will not be achievable in spill monitoring plans, since the detail that can be captured in the latter case inevitably will depend upon the specific nature of an individual spill event.

The Board also notes that oil spill contingency plans typically provide for the deployment of drifting buoys following a spill. These are designed to move with the spilled material and to be remotely tracked to give an indication of the spill location. The deployment of a larger number of 'drifters' to simulate the movement of dead oiled birds as suggested by the Panel may be feasible in most cases; however, their recovery may not be possible in many instances on the Grand Banks because of weather or sea state conditions, and therefore they may be less useful in estimating seabird mortalities than those which are deployed during spills occurring in sheltered waters. Nevertheless, the Board will ensure that the Proponent's spill response plan provides for the provision of a stockpile of 'drifters' to simulate the movement of dead oiled birds and for their deployment when conditions permit. The Board understands that the Government of Canada under the Panel on Energy Research and Development plans to undertake research to evaluate the usefulness and efficiency of these drifters in establishing the mortalities of oiled birds. [s. 4.4.2.1, p. 53]

Response Status See response to Recommendation 68 respecting spill effects monitoring.

The status of the cited PERD initiative is uncertain. The ESRF recently has funded a study into seabird mortality involving both drifter release and beached bird surveys. The work began in late summer 2001 and involves both the Canadian Wildlife Service and Memorial University of Newfoundland researchers.

The Proponent's spill response plan provides for access to drifters in the event they are required during a spill event.

Recommendation 75 The Panel recommends that the Department of Fisheries and Oceans, in collaboration with the Proponents and the Board, design a program to measure possible larval effects and fish tainting which result from released oil, and that such measures be incorporated in the Project's monitoring program.

Decision 97.02 Response The Board believes that provision for monitoring effects of a large oil spill upon organisms dwelling in the oceanic surface layer, and for taint testing following such a spill, as urged by the Panel, is a necessary feature of responsible contingency planning. The Board believes, however, that the responsibility for designing this program rests with the Proponent as part of its contingency planning obligations, and notes that the Department of Fisheries and Oceans can be a major source of advice to the Proponent during the design of the program and will be consulted by the Board during its consideration of the acceptability of the Proponent's spill response plan. [s. 4.4.2.1, p. 53]

Response Status See response to Recommendation 68 respecting spill effects monitoring. The spill EEM program includes both taint testing and water quality components.