CANADA-NEWFOUNDLAND and LABRADOR
OFFSHORE PETROLEUM BOARD

October 6, 2008

Mr. William Sheate
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Policy and Management
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Dear Mr. Sheate:

I refer to an article, authored by Gail Fraser and Joanne Ellis, entitled "Offshore Hydrocarbon And Synthetic Hydrocarbon Spills In Eastern Canada: The Issue Of Follow-Up And Experience", that was published in the *Journal of Environmental Assessment Policy and Management, Vol. 10, No. 2 (June 2008) pp. 173–187.*

Fraser and Ellis have discussed the work of the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) in assessing the environmental effects of offshore projects and in follow-up activities associated with the occurrence of hydrocarbon spills of less than 50 barrels in volume.

On page 174, Fraser and Ellis outline the content of their paper:

(1) the accuracy of oil spill predictions in three offshore oil and gas EAs,
(2) the Responsible Authorities' response where projects exceeded predictions, and
(3) the evidence for whether local oil spill experience informed future EAs for four projects

As the regulator of petroleum exploration and production activities in the Newfoundland and Labrador offshore area, the C-NLOPB has a duty to ensure that projects are properly assessed prior to their authorization, and that the operators of those projects conduct their activities in a manner consistent with the legislation and with the mitigation measures outlined in the project environmental assessment. We take this role very seriously and find it necessary to comment on the factual basis for some of the assertions made by Fraser and Ellis in the article.

Accuracy of Oil Spill Predictions

Fraser and Ellis, on pages 176 to 177, discuss probability of occurrence information and predictions of the number of spills for the lifetime of the projects that are presented in the corresponding project environmental impact statements. They have focused on batch spills of

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less than 50 barrels in volume and, therefore, our discussion here will focus on that volumetric range as well.

In the environmental impact statement (EIS) for the Terra Nova Project (Petro-Canada, 1997), the Proponent discusses oil spill mechanisms and sources, probability of occurrence, fate in and potential effects on the environment, and countermeasures. The Terra Nova EIS discussed spills associated with various development and production activities and divided spills into four size classifications:

- Extremely Large (>150 000 barrels)
- Very Large (> 10 000 barrels)
- Large (> 1000 barrels)
- Small spills (< 50 barrels)

At the time of the Terra Nova EIS, Minerals Management Service (MMS) statistics for United States Outer Continental Shelf (US OCS) offshore oil and gas operations constituted the largest data set available and the one that had been most frequently cited in the related literature. There was little spill related data available for the Newfoundland and Labrador offshore and there was limited data available for other jurisdictions worldwide.

Fraser and Ellis, on page 178, compared environmental assessment (EA) oil spill predictions with spill information for the Terra Nova project from publicly available data provided on the C-NLOPB's website (http://www.cnlopb.nl.ca/pdfs/spill/spgt1l.pdf). To be more precise, it appears that Fraser and Ellis used information from the tables for hydrocarbon spills greater than 1 litre in volume (and have themselves excluded data for spills less than 1 litre).

Fraser and Ellis, on page 179, indicate that between July 1999 and 2006 (assumed herein to be December 31, 2006), the Terra Nova project reported 33 spills less than 50 barrels, of which 17 spills were between 1 and 49 barrels, and 16 spills were less than 1 barrel. Following the same criteria, with data from July 1999 to the end of 2006, we count 35 spills (including 3 of synthetic base fluid): 14 spills between 1 and 50 barrels, and 21 less than 1 barrel.

As part of the "zero tolerance" approach in its legislation, the C-NLOPB places no lower threshold on spill reporting and collects information on spills of all sizes from offshore installations. However, as noted on page 5-77 of the Terra Nova EIS (Petro-Canada 1997) "…the MMS keeps track of spills down to one barrel in size." Further, page 5-80 notes that "Table 5.7-8 summarizes frequency of spills larger than one barrel of all pollutants from facilities and operations on Federal OCS leases from the period 1970 to 1993" (Petro-Canada, 1997). Although, on page 5-82 of the Terra Nova EIS, the proponent states that "For the Terra Nova Development the predictions are $312 \times 1.7 \times 10^{-2} = 5.3$ spills less than fifty barrels over the course of the development..." (Petro-Canada 2007), based on the underlying statistics used to arrive at this number, it is fair to say that the proponent is actually predicting a probability of occurrence of spills between 1 barrel and 50 barrels in volume.

Fraser and Ellis include spills of Synthetic Based Mud (SBM) in their count of spill events. However, in the context of the Terra Nova EIS, it is reasonable to assert that spills of SBM may be properly excluded from the analysis. The MMS indicates that synthetic drilling fluids were introduced to the Gulf of Mexico around 1999 and that they are accounted for separately (see http://www.mms.gov/incidents/spills1996-2008.htm). A careful reading of the EIS document will show that SBM is not discussed in the context of probability of spills or blowouts, and the proponent likely did not contemplate this material as a typical "spilled hydrocarbon".

It is our view that, for the period July 1999 to the end of 2006, there are 14 spills of hydrocarbons (including eight of synthetic based mud/fluid) that occupy the "small spills" category contemplated in the Terra Nova EIS. Furthermore, if SBM spills are excluded the total for the "small" size class is six.

For the period July 1999 to 2006, Fraser and Ellis, on page 179, calculated an annualized incidence rate of 5.4 spills per year. It should be noted that the period from July 1999 to the end of 2006 constitutes 7.5 years and, using the Fraser and Ellis event count of 33 incidents, the annualized incidence rate is 4.4.

Using our spill event count, the incidence rate is 1.87 incidents per year including SBM spills and 0.8 spills per year if SBM is excluded.

The White Rose Comprehensive Study (Husky Energy, 2000) discussed spills associated with various development and production activities and divided spills into four size classifications on page 407:

- Extremely Large (>150 000 barrels)
- Very Large (> 10 000 barrels)
- Large (> 1000 barrels)
- Medium Spills (50 to 999 barrels)
- Small spills (1 to 49.9 barrels)

For "small spills", the White Rose Comprehensive Study (Husky Energy, 2000) used data from the MMS and the same frequency of spill incidence: 1.7×10^{-2} spills per well-year, as was used by Terra Nova. On this basis, the Proponent projected (140 well-years) x (1.7×10^{-2} spills per well-year) = 2.8 spills less than 50 barrels volume over the lifetime of the project (Husky Energy 2000). As discussed previously, the MMS data is interpreted more properly to predict probabilities of occurrence of incidents between 1 and 50 barrels volume, and this is reflected in Table 5.4-1, page 415 (Husky Energy 2000).

Using the same methodology as they used for Terra Nova, Fraser and Ellis, on page 179, calculate that between 2003 and 2007 [herein assumed to be inclusive of both years] the White Rose project reported 36 spills less than 50 barrels, of which three were between 1 and 49 barrels, and the remaining 33 were less than 1 barrel. We agree that there are three "small spills" of volume between 1 and 50 barrels, and note that all were of synthetic based mud. As described in the White Rose Comprehensive Study on page 415, small spills "involved various pollutants including crude oil, condensate, refined product, mineral oil and diesel" (Husky Energy, 2000). The MMS uses the term "mineral oil" in reference to refined petroleum fluids not synthetic based fluids (see http://www.mms.gov/incidents/spills1996-2008.htm). As discussed with respect to Terra Nova, synthetic drilling fluids were not likely considered as potential spills in the White Rose Comprehensive Study.

For spills between 1 and 50 barrels, the White Rose Comprehensive Study predicted 2.38 hydrocarbon spills over the life of the project (Husky Energy 2000). On this basis, Fraser and Ellis (page 179) have concluded that, in four years of development and production, the lifetime prediction has been exceeded. In fact, if one includes SBM spills, the lifetime prediction has effectively been met (you can not actually have 2.38 spills). However, if SBM spills are excluded for comparison with EA predictions, no "small" spills occurred during the period.

Responsible Authorities' Response

To determine the responsible authorities' response where projects exceeded predictions, Fraser and Ellis, on page 179, asked, "Did the Regulators acknowledge the exceeded spill predictions in their publicly available annual reports?" To answer this question Fraser and Ellis state, on page 180, that they "examined C-NLOPB annual reports from 1999–2006…," and they "found no reference to the issue of EA spill predictions and observed data for either project."

Annual Reports are one method used by the C-NLOPB to communicate the activities of the Board and its staff. The annual report is not an exhaustive record of the C-NLOPB's activities nor is it a report on the performance of the offshore oil industry. The absence of a reference to the issue of EA spill predictions and observed data in the annual reports does not mean that this issue was not being addressed by the C-NLOPB.

The systems on offshore facilities are designed and operated to avoid spills. When a spill occurs, the facility operator conducts an assessment of the relevant equipment and procedures to identify failure modes. As a result of this critical examination, the operator typically identifies corrective measures and implements them to prevent future spills.

Every reported spill is followed-up by the environmental staff of the C-NLOPB. The C-NLOPB takes the lead regulatory role in ensuring that the operator is responding appropriately during the spill event and cleanup, that the subsequent investigation is thorough, and that effective actions are taken to prevent future spills. If the operator is not acting appropriately, the C-NLOPB has the authority to take control of the facility to ensure appropriate actions are taken.

Where the C-NLOPB believes that an operation does not comply with regulations or approved plans, the Chief Conservation Officer (CCO) may issue a notice to the operator in relation to this noncompliance. Where the C-NLOPB believes the operator is not taking appropriate steps to comply, the CCO may issue an "order to comply". If the CCO believes that a spill is likely to occur if a facility continues to operate, the CCO may suspend operations at a facility until the operator can demonstrate that the facility can operate safely.

Spills to the offshore environment are prohibited by legislation. Where circumstances warrant, the C-NLOPB may pursue court action against an operator in relation to a spill. The C-NLOPB has pursued two court actions against operators in relation to spills in C-NLOPB jurisdiction.

All offshore operators in the C-NLOPB's jurisdiction are required to develop Oil Spill Response Plans that include response measures for spills of all sizes. Operators are required to maintain response capabilities that can be deployed rapidly in the field. In addition, operators must annually undertake an on-water training exercise where spill response equipment is deployed and operated. These measures are intended to ensure that, when spills do occur, there is capability to respond appropriately.

Regional Information Considered in Environmental Assessments

Fraser and Ellis, on page 180, posed the following question: "Did the Regulators (i.e., the Boards) have an opportunity to require a section in EAs which considers regional spill experiences and if yes, was a section provided?"

For the Newfoundland Offshore area, Fraser and Ellis examined the Terra Nova (Petro Canada, 1997) and White Rose (Husky Oil, 2000) environmental assessments. They acknowledge, on page 181, that, as the Terra Nova EIS occurred in 1997, and development drilling at Hibernia started in 1997, there was no prior local experience to be considered during the Terra Nova assessment.

The White Rose Comprehensive Study was published in 2000, and approved in June 2001. Spill related information from both the Hibernia and Terra Nova projects was available if limited.

Fraser and Ellis, on page 181, state that there "was no specific reference to local spill experience in the White Rose EA". This is incorrect. The "White Rose Oilfield Comprehensive Study Supplemental Report" (Husky Energy, April 2001) presented a comparison of the historical statistics against the (then) three years of available local offshore spill data. The Supplemental report has been a publicly available document since its preparation in 2001.

Furthermore, the C-NLOPB since 2005 has required that proponents include the Newfoundland and Labrador offshore spill data in their environmental assessment for petroleum exploration and development activities. These environmental assessments are publically available on the C-NLOPB Web site (see, for example, Section 8.1.6 at http://www.cnlopb.nl.ca/pdfs/hedc/sa883c8.pdf .)

Concluding Remarks

In summary:

- Predictors of spill occurrence likelihood for the Terra Nova and White Rose projects were developed using the best data available at the time they were completed.
- Based on the data used to generate "small spill" predictors, the appropriate volume range on these spills is 1 to 50 barrels, and not "less than 50" barrels as cited in Fraser and Ellis.
- For the Terra Nova project, 14 "small spills" occurred over the period discussed by Fraser and Ellis, including eight spills of synthetic based mud/fluid.
- For the White Rose project, three "small spills" occurred over the period discussed by Fraser and Ellis, all of synthetic based mud.
- The C-NLOPB follows-up on all spills and the compliance and enforcement actions reflect the nature of the incident and the operator's response.
- Contrary to Fraser and Ellis's assertion, the C-NLOPB has required local spill occurrence information to be considered as part of subsequent environmental assessments.

Sincerely yours,

Max Ruelokke, P. Eng.
Chairman & CEO

References

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