
Risque

Question:

En ce qui concerne l'étude d'analyse de risques, est-ce que l'utilisation de méthaniers de moindre tonnage (145 000 m³) augmentera le nombre de transit? À cet effet, est-ce que cela changera les conclusions de l'analyse de risques?

Réponse:

Veillez vous référer à la réponse de DNV ci-jointe.

Risque



MEMORANDUM

Project Memo 30

To: John van der Put and Wolfgang Neuhoff

From: Ernst A. Meyer

Date: May 11, 2006

Re: 165,000 m³ LNG Carriers – Effect on technological risk assessment

A question was asked regarding the study basis for the technological risk assessment during the BAPE hearing. It has been assumed that LNG Carriers with 216,000 m³ cargo capacity will be applied giving the basis for cargo tank volume, number of port calls, geometrical data and exposure time. The intervener wants to know if use of LNG Carriers with 145,000 m³ cargo capacity is changing the risk picture.

Use of a 216,000 m³ LNG Carrier in the EIS is providing conservative leak scenarios as the amount of LNG that can be released through a breach is greater than for a 145,000 m³ LNG Carrier. The consequence factor in the risk equation ($RISK = CONSEQUENCE \times FREQUENCY$) will therefore be reduced if smaller vessels are applied.

An assessment has been conducted to investigate if the frequency of LNG leaks from LNG Carriers will increase if smaller ships are used. This can only be the case if risk contributions from increased frequencies outweigh the risk reduction from the lower consequences.

Three scenarios where LNG can be released from an LNG Carrier were considered in the EIS:

Scenario 1: Cargo tank leak following LNG Carrier collision with errant vessel during approach

Scenario 2: Cargo tank leak following errant vessel collision with LNG Carrier at berth

Scenario 3: Cargo tank leak following LNG Carrier collision with the jetty

Scenario 1 and 2

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Most of the traffic in the shipping lane is expected to choose Chenal du Nord when passing the terminal. Five percent of all vessels are however expected to use Chenal du Sud as the preferred shipping lane. This means that the terminal will be exposed to 300 vessels sailing in a shipping lane with a centre located approximately 2.5 nautical miles from the terminal. The traffic in the Chenal du Sud contributes 98% of all possible strikes from a passing vessel. The collision frequency is 6.43×10^{-6} per year for the 145,000 m³ carrier making 66 port calls and 7.38×10^{-6} per year for the 216,000 m³ carrier making 44 port calls. This is because the geometry of the LNG carrier has a greater impact on the striking frequency than the number of port calls. The base frequency for collision with release potential for the 216,000 m³ LNG carriers is therefore higher than the corresponding frequency for the 145,000 m³ LNG carrier. The frequency numbers applied in the EIS are therefore conservative for scenario 1 and 2 and amplify the risk reduction coming from consequence reduction.

Scenario 3

During its approach to the terminal and the jetty, the LNG carrier may lose control and risk hitting the jetty. Calculation of this striking frequency has been conducted for 145,000 m³ LNG Carriers providing 66 port calls per year and for 216,000 m³ LNG carriers providing 44 port calls per year. The annual striking frequency with LNG release potential will be 1.07×10^{-8} per year for 66 port calls and 7.13×10^{-9} per year for 44 port calls. Uses of smaller ships will hence cause a small increase in frequency for Scenario 3. This frequency increase will however be outweighed by the frequency decrease from Scenario 1 and Scenario 2. The frequency reductions from Scenario 1 and 2 are magnitudes of orders larger than the frequency increase from Scenario 3.

Conclusion

A negligible risk reduction will occur if a 145,000 m³ LNG Carriers are used instead of 216,000 m³ LNG Carriers as anticipated in the EIS. The reason is reduced consequences due to less volume that can be spilled. Frequencies will also increase due to size of the LNG Carrier outweighing the increase in collision frequency coming from more frequent port calls.

The answer to the intervener is that uses of 216,000 m³ LNG Carriers have provided higher collision frequencies and more severe consequences than if 145,000 m³ LNG Carriers had been used. The risk results of the EIS are hence to be regarded as conservative.