Enbridge Northern Gateway Project
JRP Hearing Notes

Day 76 – April 4, 2013 – Prince Rupert – Vol 160

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BC Nature and Nature Canada motion

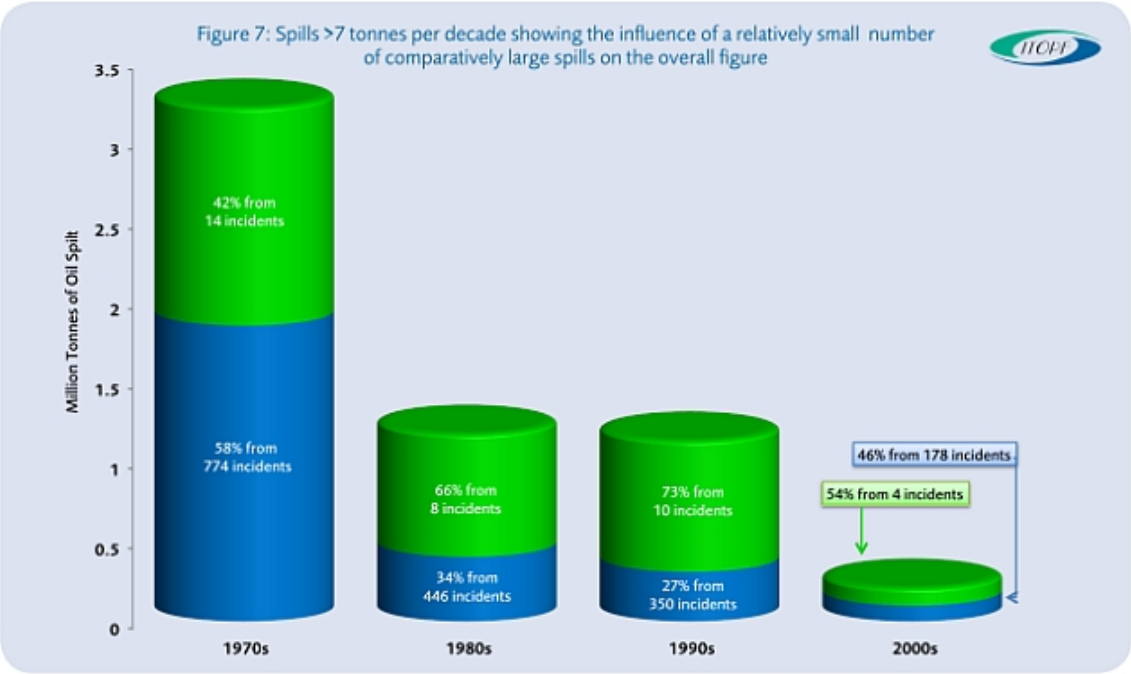
On April 2, BC Nature and Nature Canada filed a motion [Exhibit D12-29-2] which asked the Joint Review Panel (JRP) to issue a procedural direction addressing two questions: 1. what is the content of the right of cross-examination and, 2. what are the obligations of witnesses when under cross-examination. BC Nature further seeks to have the current Northern Gateway shipping and navigation panel extended and to have any ensuing panels stay pending a ruling on this motion. 4051

The Chairperson set out a schedule for other parties to comment on the motion. She stated that "the Panel will not extend the hearing time for the current shipping and navigation witness panel or otherwise defer future witness panels at this time. If necessary, witnesses could be recalled to testify."

Examination by Ms. Virginia Mathers for Gitxaala Nation 4090

Tanker spill statistics and the world's largest spill

As an aid to cross examination (AQ), Ms. Mathers put up "Oil Tanker Spill Statistics 2011" by the International Tankers Owners Pollution Federation (ITOPF) [AQ76-A] Mr. Keith Michel said "This is one of the best sourcdes and most comprehensive sets of data on oil spills." Ms. Mathers highlighted from the report that "most of the oil spilled … comes from a relatively small number of large spills. Discussion focussed on the fact that the number and volume of spills has declined significantly, that virtually all the spills are from single-hulled tankers. Mr. Michel said "Someday, we will have a spill from a double-hulled tanker larger than 2500 tonnes, in fact, the large spill scenario that is presented in TERMPOL is 36,000 cubic metres versus the 2500 tonnes or roughly 3,000 cubic metres that has been experienced by double-hulled tankers since 1990. So the assumed large spill in TERMPOL is more than 10 times the size of what's been experienced to date from double-hulled tankers." 4095



Ms. Mathers questioned whether the small number of spills from double tankers is because they are a newer fleet. Mr. Michel agreed, but pointed out that double hulled tankers have been increasing since 1990 – 22 years – and are now 95% of the fleet. Table 1 lists major spills since 1967. The Exxon Valdez is shown at the bottom, as 35th on the list. Ms. Mathers said, it is listed, "not because it's one of the largest, but for comparison." She then had Mr. Michel confirm that some of these much larger spills happened on the high seas, and some happened near ports. 4123

Examination by Ms. Cheryl Brown for Douglas Channel Watch 4161

The effectiveness of escort tugs & the confidential source of data

Ms. Brown said she would be asking some questions about tugs, and put up Table 8-1, "Risk reducing effect of using escort tugs/tethered tugs" from the Quantitative Risk Analysis [Exhibit B23-34], written by Det Norske Verita (DNV). She said that according to DNV, "the introduction and proper operation of tethered and close escort tugs more than triples the return periods." She asked how the results in Table 8-1 were obtained. Mr. Audrun Brandsaeter said the basis for the numbers was a report for another client – which is confidential. Mr. Steven Scalzo said that other studies support their results. "We have not experienced any incidences at all with respect to tankers with escort tugs that have resulted in either powered or drift groundings." 4168

Mr. Scalzo indicated that these other studies are available to the public. Ms. Brown asked why they chose to use a confidential report, but not the available ones, for reference data. Mr. Brandsaeter said "There was no particular reason, except that this report ["Optimized Escort Tug Operations At Fawley Terminal, DNV, 2002] gave numbers in terms of percentages in risk reducing effects for all the types that they wanted to assess." Mr. Brandsaeter gave more details, supported by Mr. Scalzo. Mr. Michel said that his company did a close escort study in 1999 which showed 64% to 91% effectiveness for close – not tethered – escorts. 4210

Results based on experience and necessary steering force

Ms. Brown asked if it was "experiential data" that the findings of effectiveness are based on. Mr. Brandsaeter said, "This is based on experience and the calculation of necessary steering force, the technical aspects of the situations that could occur and could cause a grounding to occur." Ms. Brown asked about modelling. Mr. Scalzo described what his company did years ago. The developed the computer models to model tug forces. Those were verified by live tug tests. The modelling was then applied to very large ships, specifically to tankers. Then they built some tugs. "We were the first … to use it for large tanker escort." 4261

Ms. Brown asked about difficulties arising from having multiple vessels – a tanker and multiple tugs – interacting. She expressed concern about there being no database of "near misses." Mr. Scalzo said, "In the case of escort tugs and utilization with tankers for escort there haven't been any incidences." 4285

Proud developer of tractor tugs

Mr. Jerry Aspland said, "I need to say just a couple words here." He then described from his perspective the development of the first purpose-built tractor tugs – the same story explained moments earlier by Mr.Scalzo. He ended with, "As I sit here and listen -- and I've been involved in this Project -- tractor tugs, the design of this system deserves the credit it gets for increasing the safety of this program." 4309

Ms. Brown was not clear on whether the tug studies were concerned with escort tugs or tetherered tugs. Mr. Brandsaeter said "Even though it looked both at the tethered tugs and close escort tugs, we didn't give any additional benefit to the tethered escort tug with regard to power grounding, … because it's very likely that the tethered tugs would have a better effect than just a close escort tug." 4376

Tugs are a mitigation, the tankers could do the transits alone

Ms. Brown said, "You indicated that tugs were not a necessary piece for the transport of vessels in this Project; that they were a mitigating piece. … that the transit of these large vessels can take place without the aid of tugs and that it was quite possible to do." Mr. Aspland said, "The answer to that is 'yes'." Mr. Al Flotre said that for most of the last 22 years the tankers traveling from Vancouver Harbour to Victoria Pilot Station travelled without escort.

Ms. Brown: "You say that tugs are actually not necessary. … Is there a possibility that the tethered tugs would not be implemented within this Project?" Mr. John Carruthers replied, "No, we're committing to the tug escort as we've outlined, that's tethered and escort for laden and escort for unladen." 4386

Noting that the Fawley Marine Terminal in Southhampton port [AQ77-A] is "huge," she asked why it was considered relevant to the NGP situation. Mr. Brandsaeter said it is because they use escort tugs in canals which are much narrower than applicable for NGP. "It gave us information about what effect the tugs could have," but the size of the terminal is not necessarily relevant. She asked about other comparative situations. Mr. Michel said the Strait of Juan de Fuca is wider than the confined waterways from Triple Island up to Kitimat, but it has much more marine traffic and crossing traffic. The risk of a collision is significantly higher in the Strait of Juan de Fuca, but there's a higher risk of drift groundings in the Triple Island-Kitimat route. "And as we've seen, the principal advantage of escort tugs, and especially tethered escort tugs, is in mitigating the influence of a grounding." "In the case of Triple Island to Kitimat, that risk was identified as the principal risk of concern, … and, therefore, the escort tugs were adapted for this particular project." 4408

Ms. Brown's questions compared Fawley to Kitimat – Mr. Brandsaeter said they have similarities in terms of sharpness of turns, though Triple Island to Kitimat is longer. She asked, "What's your level of confidence in determining your 80%?" Mr. Brandsaeter said, "We didn't estimate a confidence interval." Ms. Brown: "Have any of your studies been peer reviewed?" Mr. Brandsaeter: "Not to my knowledge, no." 4437 Ms. Brown: "Would not a greater transparency of the data have been appropriate?"

QRA development and IMO's Formal Safety Assessment guidelines

Ms. Brown asked questions about the standards by which the QRA was developed and the transparency of its process, methods and sources. She said, "I have not seen information that allows me to understand what is happening at the QRA, particularly in regard to understanding the significance of tugs. Mr. Carruthers said, "I'm not sure what we can add." Then he reiterated a number of points in defence of the QRA. 4478-4575

Ms. Brown noted that Adobe 20 says the QRA methodology was based on the IMO definition of a Formal Safety Assessment (FSA). Mr. Brandsaeter the FSA has broad applicability and not all of it is applicable to a specific instance. He added that there is a compromise between transparency and the possibility of obtaining information if names of people, for instance, were to be disclosed. Ms. Brown put the FSA guidelines on the screen [AQ77-B] and began a detailed set of questions about the guidelines and the QRA, including the effects of the human element. Readers are invited to follow this discussion directly in the transcript, 4576-4709

The human element

At one point, it is noted that the human element is factored into the QRA in the incident data it is based on – that is, it is not an additional factor that the QRA overlooks. Mr. Flotre said that the human element is mitigated by human redundancy: a pilot is on board and in control of every tanker, in the presence of the ship's master and the bridge team. One or two escort tugs are also in attendance. The MCTS will be monitoring the actions of the pilot and the tanker. 4709

Ms. Brown mentioned "the organizational and the leadership piece" in the FSA. Mr. Thomas Wood said, "The tanker business is one of the most highly-regulated businesses in the world today. Tankers are safe and the statistics prove that." 4725-4744

HAZID process

Ms. Brown said, "The statements of risk and determination of risk is part of the QRA, and it was done through a qualitative piece, which is through the HAZID process. Is that correct?" Mr. Brandsaeter replied, "The identification of a hazard is a main and early part in all risk assessment, be it quantitative or qualitative. The main purpose of the Hazard ID workshop is to identify what can go wrong and to select and also assess how likely is it and how bad could the consequences be; but, primarily, identify the hazards. That is … normally a qualitative process." Ms. Brown asked about the number of interviews. Mr. Brandsaeter said that the Hazard ID workshop and in the interviews went far beyond normal. 4761

Intolerable risk

Ms. Brown returned to the FSA guidelines, and noted point 5 in Appendix 5, which reads, "The current best practice is to recognise that there are three levels of risk: Intolerable, As Low As Reasonably Practicable (ALARP) and Negligible. She asked if NGP had defined "intolerable". Mr. Michel said, "NGP did not attempt to define what was intolerable. NGP performed the quantitative risk assessment and lowered the risk as low as reasonably practicable. It's NGP's belief that it is a very safe transportation system. But, ultimately, [that] decision … rests with the government."4795

A confusing discussion about risk is in the transcript, beginning at paragraph 4808 to 4889 where it regains some coherence. Mr. Michel said, "I'll be repeating myself, but I'll briefly summarize one more time what we've done. With the QRA, we've done an assessment of likelihood of a spill and the size of the spill. And that study was sufficient to assess mitigation measures which have been adopted by the project. 4890

NGP has done extensive analysis both in the QRA and in the environmental risk assessments to enable the discussion on acceptability of risk. And that includes the probability data of the spill, the expected size of spills and where they might occur and response issues and trajectories related to those spills. So that data will enable that discussion. 4891

Ms. Brown responded: "As part of risk analysis, a cost benefit analysis is often done. … Why was a cost benefit analysis not done as part of the QRA and the risk mitigation pieces?" Mr. Michel: "Northern Gateway was prepared to adopt those [identified risk mitigations] without investigating costs, so there was no need to proceed with a cost benefit analysis. … The risk reduction measures were adopted without having the need to assess the costs." 4892

Ms. Brown said, "These measures are not mandatory, though. They are a commitment … given by NGP." Mr. Carruthers said, "We're prepared to be held accountable for those commitments." 4901

On costs and design of tugs

Ms. Brown asked for details related to the payment of tug operations. Mr. Carruthers didn't have details as to how the costs would be recovered, but confirmed the project would cover them. Questions about tug design plans ensued, and Mr. Scalzo spoke about designs meeting performance capabilities. Ms. Brown sought assurance that tug design would maintain proposed risk levels if they changed through time. Discussion continued around costs and design of tugs, with the witnesses repeating general statements that design would be consistent with NGP's study, and that technological improvements may take place over time. 4928

Ms. Brown asked how the risk mitigation measures, as discussed on Adobe 141 of Exhibit B23-34, were factored into risk reduction probability. Mr. Brandsaeter spoke about the qualitative assessment of the measures and stated that they were not reflected in the return periods in the QRA, noting that in real life, these mitigation measures would reduce probability of events. 4984

Turning to Table 8.7 on page 148, Ms. Brown asked about the high return period for smaller oil and condensate spills in both mitigated and unmitigated cases for the terminal. Mr. Brandsaeter indicated that the values are the same because mitigation measures would affect larger spills only, answering that small spills are less than 7 tonnes. 5054

S turn manoeuvres

Ms. Brown asked about S turn manoeuvrability in Lewis and Wright Channels and Mr. Flotre provided details from his experience. Mr. Cowdell called up Exhibit E11-3-2, Adobe 25, which he indicated provides details related to the subject matter in question. 5097

Examination by Mr. Dave Shannon for Douglas Channel Watch 5128

Increased traffic in Wright Sound

Referring to the calculations in Exhibit B23-3, Adobe 109, on projected increases in traffic in Wright Sound, Mr. Shannon asked if a value of mass, rather than a percentage could be given for the increase. Mr. Cowdell explained that the reason a percentage in terms of vessel numbers was given was to assess risk of collision. He didn't think an increase in mass would be helpful. 5129

Mr. Shannon asked for NGP's projected traffic increase in relation to the proposed Rio Tinto Alcan shipping increases in the area. Mr. Wood explained that NGPs' calculations included the proposed traffic increases at the time of the application, but do not consider new proposals since that time. 5142

Tug accidents and capabilities

Mr. Shannon asked what could be done in a scenario where a tug towing a barge from another project loses power and has the potential to create an incident with a nearby tanker being towed. Mr. Scalzo and Mr. Flotre indicated that the pilots and captains present would decide on actions to be taken in such a scenario. 5150

Calling up Exhibit D35-14-5, Adobe 29, Mr. Shannon cited an incident where a tanker was pierced by a barge and asked what speed would be required to pierce the hulls of a double-hulled tanker. Mr. Michel answered that many factors would contribute to the penetration of both holds of a double-hulled tanker, including shape of the striking vessel bow, structure of the tanker, and angle of obstruction; so the speed required for piercing would vary. 5158

Calling up Exhibit D187-4-3, Adobe 1, which speaks to analysis of marine casualties for the Port of Los Angeles, Mr. Shannon asked if the reported rates of loss of power and steering for shipping could similarly affect tugboats. Mr. Scalzo spoke about improved accident rates since the use of escort and assist tugs has begun. 5173

Mr. Shannon cited an incident of a tanker hitting a dolphin as a result of a fire on a tug boat causing it to loose control of its ship, as referred to in Exhibit D187-9-1, Adobe 10. He asked what could be done to prevent a similar situation in the event of a fire on a tug in NGP's operations. Mr. Scalzo spoke about updated safety procedures since the time of the incident in question, including ship management standards, as well as oversight of management of shipping companies. He also spoke about improved alarm systems on tugs. Discussion moved to propulsion systems and capabilities of tugs. 5177

Related to tug capabilities, Mr. Shannon asked about loss of power forecasts, and asked if it could be expected that 4-5 loss of power or steering incidents would occur per year. Mr. Scalzo didn't think this number could be expected and spoke about maintenance requirements of tugs. Mr. Flotre added his thoughts on the infrequency of engine and rudder failures, from his experience in BC. 5191

Discussion moved to fuel sources for tankers. Mr. Michel explained that tankers would burn diesel oil within 200 miles of shore as well as in port, with fuel changeover occurring in outside waters. Mr. Shannon asked about the risks associated with fuel changeover and Mr. Michel explained that new regulations governing changeover and diesel oil and equipment storage "seem to be working quite well". 5198-5206

Impact of harsh weather on operations

Mr. Shannon asked how well radar works in freezing rain or heavy snow. Mr. Wood explained two different types of radar used, with one being more affected by weather than the other. Mr. Scalzo and Mr. Flotre provided additional details and indicated confidence in the radar systems and towlines under heavy weather conditions. Mr. Flotre added that there are "no conditions in Kitimat or Douglas Channel that would roll over a tugboat." 5222-5237

Mr. Shannon brought up an example of gale warning with freezing spray in Douglas Channel in 2012, pointing out that such weather does occur in the area, and asking if problems can occur with tug boats in these conditions. Mr. Scalzo talked about his experience in more difficult areas such as the Arctic and stated that tugs should not have a problem working in the conditions in the area in question, noting that they are outfitted with heating systems to minimize effects of ice. Discussion continued briefly on weather effects on buoys. 5239

Mr. Shannon asked about the effect of harsh weather on laser guidance systems for tanker berthing at Kitimat. Mr. Flotre indicated that berthing could take place in the event of inoperable laser systems, which are meant as aids only. 5246

Mr. Shannon brought attention to an ore carrier sinking in 1979, which took place on the northern tanker route, as referred to in Exhibit D187-8-9, and D187-8-15. Mr. Flotre was familiar with the incident and spoke about the former era of vessels in poor conditions, which wouldn't be allowed on the water under today's procedures. Mr. Wood spoke about the inherent stability of a tanker as opposed to an ore carrier. Discussion moved to stability of single-hulled versus double-hulled tankers and Mr. Michel again spoke about improved rules and procedures. 5252

Mr. Shannon asked further questions about tanker design, establishing that there is a 6-10 foot gap between inner and outer hulls on double-hulled tankers. Discussion again moved to stability of vessels under various conditions. 5275

Mr. Shannon spoke about an Environment Canada publication on marine weather hazards, which indicates incidents of 21-meter high waves in Dixon entrance. He asked how a tanker would behave in such conditions. Mr. Michel reiterated that "tankers are

designed for extreme weather", and spoke about such wave heights being taken into consideration when designing ship structure. 5285-5298

On tank coating and corrosion, implications for safety risks

Discussion moved to tank coating requirements and Mr. Michel spoke about his opinion on the importance of coating of ballast tanks and of maintenance regimes to avoid corrosion. 5311

Mr. Shannon asked about Transport Canada tanker inspections, as referred to in Volume 156, paragraph 31619. Mr. Michel said he wasn't in a position to discuss the levels of inspection, and advised referring to their documents instead. Mr. Shannon continued with questions about cargo inerting and Mr. Wood continued with details on this. Mr. Michel took over as discussions turned to more detailed chemical descriptions and implications for corrosion. Discussion moved to implications for risk of explosion in ballast tanks and back to cargo tank coating, at length. 5325

Mr. Shannon brought his questions back to inspections, and how they could detect compromised coatings which would have implications for corrosion. Mr. Michel explained that double-hulled tankers built within the last 10 years are subject to IMO regulations which require close-up visual inspections, which can detect coating breakdowns, and would then require repair. Mr. Wood added that he himself had observed such cracks, which are "very, very easy to see and very, very easy to repair." 5402-5408

The dialogue moved to discussing where corrosion is most likely to occur on a vessel with Mr. Michel explaining that corrosion generally occurs in places with a horizontal plate allowing sediment and moisture to sit. 5414

Weather monitoring and forecasting, importance of anemometer positioning

Mr. Shannon called up Exhibit B17-19, Adobe 36, and asked about the relative distance and height of the tree stand to the NGP environmental monitoring station. Mr. Fissel couldn't give exact details, but referred to a topographic map on the page and spoke about anemometer positioning. Mr. Shannon spoke about World Meteorological Organization guidelines for height and distance of an anemometer from obstructions, in order to get most representative wind measurements. Mr. Fissel acknowledged the rationale of the guidelines but stated that "for coastal weather stations, you cannot always achieve the guidelines…given the terrain the vegetation that occurs in this whole area" 5420-5434

Pulling up a separate report on anemometer accuracy, Mr. Shannon asked for comments on the given rationale for anemometer positioning. Mr. Fissel pointed out that the report referred to wind readings for wind turbine placement, and again stated that "when there are obstacles, you choose the best possible site you can…and then you make adjustments…and allow for those in interpreting the data… and then in understanding and using that data, one has to make interpretations and adjustments based on the placement of those anemometers." 5436-5442

Following up on Mr. Fissel's comments, Mr. Shannon asked what adjustments would be made. Mr. Fissel reviewed various options, such as scaling up wind readings to compensate for sheltering effects of obstacles, or adjusting for height of anemometers in relation to open water conditions. He added that these are the type of adjustments that would need to be made to estimate the winds in the navigation channels in question. Mr. Shannon sought further details on calculations that would be made and Mr. Fissel spoke about adjustments included in testimony and in evidence. 5444-5456

Discussion on weather analysis and prediction methodology continued with Mr. Fissel speaking to kinematic modelling used to analyze output from physical monitoring stations, which was also used for NGP's oil spill modelling. Mr. Shannon asked further questions about the kinematic modelling techniques and Mr. Fissel discussed his interpretations of the techniques and applications of the model. Mr. Cowdell spoke about the history of safe shipping in the area, using the assistance of Environmental Canada weather stations, as well as private stations for weather forecasting. He noted that the additional information from NGP weather stations would only help with future forecasting for shipping and navigation efforts. 5458