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Pipeline Operations, Emergency Preparedness & Response Panel

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Mr. Dale Burgess	Mr. Barry Callele	Mr. Ray Doering
Mr. Jeffrey Green	Dr. Matthew Horn	Mr. Walter Kresic
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18978

What are cathodic protection readings?

These are a few points from an informative discussion about cathodic protection and fusion bond epoxy coating and corrosion which begins at 18978

Mr. McCormick asked what is being read with the monthly rectifier readings from the cathodic protection system. Mr. Kresic replied, "The voltage and amperage at the rectifiers." "Changes to cathodic protection systems occur slowly. They occur over a year, over several years. In some instances there can be shorter frequency changes. And, in general, the changes are not extreme, they're nominal within a bandwidth of expectation. So a single reading per month suffices."

"The equipment gathers the data realtime. It has telecommunications devices that send signals back to a computer at the technician's desk and he can track the exact information." "In the past we would physically have to go out to site and gather the data."

"There's two basic criteria that all below-ground structures have to meet: one is called an 850 millivolt voltage range. So the readings have to consistently show that level or within a range of that level. And if they shut the rectifier off, which they do for testing, the change in the voltage can't be more than 100 millivolts within a certain timeframe. And if those two conditions are met, that demonstrates adequate cathodic protection. 19029

The test stations are a mile or two apart. More frequent intervals are a simple matter where there's a need for greater granularity.

Fusion bond epoxy coating

Mr. McCormick asked about the issues that may arise with fusion bond epoxy coating and cathodic protection, beginning at 19040.

Cathodic protection is corrosion operating in reverse

Can changes in soil resistivity shield parts of the pipeline from the protective cathodic protection current?, Mr. McCormick asked. Mr. Kresic replied that it could, but if it's in that sort of a situation then you have the other theoretical possibility of no corrosion, because if you can't get cathodic protection current to the pipe, that means that there's no environment for current to move which then again eliminates corrosion from happening. Cathodic protection is really corrosion operating in reverse. 19046

Spill trajectory, control points and road access

NGP had an undertaking (U39, Exhibit B147) on October 16 to answer the question for Mr. Jones of the Province of BC, "What portion of the pipeline would be more than 2 kilometres away from road access?" Mr. Jones' original request was to know "in addition, points to which a spill might travel" which would be 2 km or more from road access.

Mr. McCormick explored that aspect of road access. He asked whether knowing where the right-of-way and roads are, will "tell us where spill response efforts will have to be located." Mr. Underhill said that "Access to the right-of-way is a critical component. Also critical is … access to those control points, and that access can be by road where such roads exist or by air." 19065

Mr. McCormick asked for an undertaking to provide "a listing of the points to which a spill might travel that would be located two kilometres or more from road access," Mr. Underhill and Dr. Horn both explain how much work that would entail, so Mr. McCormick suggested instead that a map be provided, overlaying the linear corridors and spill trajectories." Again, the witness panel noted the extent of the work. Mr. Doering said, "As part of the detailed response planning activities that will occur over the coming years … we would be undertaking this type of analysis for all of the watercourses." 19082

Mr. McCormick invoked Mr. Langen's approbation when he said, "And in that regard we've heard a lot on the record to date about how, you know, don't worry, we will do this spill response planning, we -- we're going to work on this for five years and we're going to have our ducks in a row if this project is approved and the project goes ahead, and we're trying to assess the extent to which that sort of a promise can truly be characterized as a mitigation measure in this context." 19154

Mr. Langen also proposed that NGP provide as an undertaking "a plan that they have developed to move forward towards developing the emergency response plan." The Chairperson supported this proposal and denied the Haisla's request.

Integrity management

Mr. McCormick asked, "Am I correct in my understanding that the comprehensive fitness-for-purpose criteria will be the primary measure of the integrity of the pipeline when assessing the potential impacts of deterioration on safe operations?" Mr. Kresic replied that "it is one of two paths that are taken and then combined." 19183

Mr. Kresic explained that the integrity management section of the CSA Z662 Oil and Gas Pipeline Code describes two paths an operator can take to conduct integrity management -- two high-level paths. "One is to conduct a hazard assessment. So basically purely fitness-for-purpose and directly mitigating the threat based on what you know and measure. The other is in conducting a risk assessment where maybe you don't have the full capability of a fitness-for-purpose technique, then you would begin to prioritize activities. We do both and we combine them both." 19212

"We both collect all the necessary data for fitness-for-purpose on the pipeline system and then knowing that there's always some scientific uncertainty we'll also conduct risk assessments and apply additional measures in places where consequences are known to be higher, despite what the fitness-for-purpose may indicate as being appropriate." 19213

Mr. McCormick asked whether Northern Gateway has determined what the comprehensive fitness-for-purpose criteria will be for all of the components of the pipeline project? Mr. Kresic said, "Yes. We would apply the current fitness- for-purpose criteria that we utilize on all of our pipeline systems." 19217

Examination by Ms. Jennifer Griffith for the Haisla Nation 19229

Mass balance of oil fates

Ms. Griffith began with the "Mass balance model" in Ecological and Human Health Risk Assessment (EHHRA) (Exhibit B80-4), page 114, and asked about the percentages of dilbit, synbit and condensate that would become entrained in the water column from a spill in the Kitimat River. Dr. Horn's first noted that the figures in text were incorrectly taken from the Morice River scenarios, and that Table B.4-6 contains the correct values for the Kitimat River.

Thus (using the corrected values), for a diluted bitumen spill into high flow conditions, the table shows that 16% will be deposited into the sediments, and that 67% will coat the shoreline. For synthetic crude, 49% will be deposited, and 22% will "exit the grid" in the water column flow into Kitimat Arm of Douglas Channel beyond the extent of the model. For a condensate spill,49% of condensate will evaporate, and 32% will "exit the grid" in the water column. 19234

Table B.4-6. Mass Balance of Oil Fates for Each Modeled Scenario in Kitimat River

Scenario	Surface	Atmosphere	Water Column	Sediment	Ashore	Decay	Exits Last Grid
KR-DB-HQ	0.0%	4.2%	2.3%	15.8%	66.7%	10.7%	0.3%
KR-DB-LQ	0.0%	5.4%	0.2%	31.3%	54.9%	8.2%	0.0%
KR-SO-HQ	0.0%	5.7%	12.1%	49.1%	6.1%	5.6%	21.5%
KR-SO-LQ	0.0%	16.8%	5.7%	20.7%	16.7%	17.2%	22.8%
KR-CD-HQ	0.0%	49.3%	6.4%	0.0%	7.1%	5.0%	32.2%
KR-CD-LQ	0.0%	80.0%	0.7%	0.0%	11.7%	3.6%	4.0%

Dr. Horn explained that "where the oil enters the river, it'll float on the surface because it's positively buoyant. It'll begin to weather, it'll lose its lighter ends as things evaporate; as lower molecular weights dissolve into the water column, the density will increase, it will bind with particulates in the water column, it'll gain density. The turbulence in the river is constantly mixing these entrained droplets. They can hit the bottom and they can actually sediment out. So, yes, in a portion of this, the density can become greater than one, as I've mentioned before, if it comes in contact with sediments and you form these agglomerates of hydrocarbons and essentially soil.19265

Environment Canada and spill modelling

In Exhibit B83-2, NGP wrote, "Northern Gateway and Environment Canada agreed during the June 20, 2012 meeting that additional spill modelling may be useful for the development of detailed site specific response plans (geographic response plans) during the detailed planning phase post Project approval." 19283

"Environment Canada has indicated to Northern Gateway that this type of research is more appropriate in a post-approval phase. Is that correct." Ms. Griffith asked. Mr. Milne agreed, and noted that discussions with Environment Canada have been in the marine context.

Evaporation of oil

Exhibit B3-20 provides examples of hypothetical hydrocarbon spills related to the

pipelines. Ms. Griffith asks about evaporation of dilbit. Dr. Horn explains that the evaporation rate is a function of exposed area, temperature, wind, type of oil. 19332

Worst case spills

Ms. Griffith put up Exhibit B80-2, of the EHHRA. It is a full bore rupture of 1,293 cubic metres of oil into Hunter Creek, modelled on the assumption that the spill is detected and the valves are closed in 13 minutes. She confirmed with Mr. Underhill that it does not consider that the valves will not close in the 13 minutes. 19372

She then put up the US DOT's September 7, 2012 final order regarding violations and monetary penalties associated with the spill at Marshall, Michigan. In it, the DOT stated that Enbridge had estimated a worst case spill at mile post 608 of 3608 barrels. But because the isolation valves did not close for approximately 17 hours, the total release was at least 20,000 barrels. 19384

Mr. Baumgartner explained that the problem was not with valves but in the control room and described actions Enbridge has taken to reduce the chance of similar errors happening again.

Ms. Griffith asked, "Wouldn't it be prudent for Northern Gateway, through its spill modelling, to be prepared for a situation where for some reason the 13 minute shutdown target is not met?" Mr. Underhill expressed NGP's confidence in its modelling, preparedness, and commitment. She comes back to this issue again. 19421

The 10 minute shutdown rule

Ms. Griffith confirmed Enbridge's 10 minute rule whereby when an operator receives an indication of a problem, if within 10 minutes he or she is unable to confirm that it is not a emergency on the system, then the operator will commence shutdown. Mr. Baumgartner said there were two occasions in which the 10 minute rule had not been adhered to on Line 6B: the Marshall incident, and once a couple of months earlier. 19447

Ms. Griffith asked if NGP would accept as a condition of its permit that it must implement an automatic 10 minute shutdown system. Mr. Baumgartner replied that they would have to examine the risks through their formal change management process. "Pending that then I think we could move forward with it." 19506

Pipeline Regulations

Ms. Griffith asked about pipeline regulation. "In Canada pipelines are regulated by the National Energy Board in accordance with the Onshore Pipeline Regulations (OPR-99). And that regulation refers to and incorporates standard CSA Z662. Mr. Baumgartner confirmed this, and that the standard contains general requirements for establishing emergency procedures, but does not contain technical procedures. 19488

Shutdown control at the PLC or SCADA level

Mr. Callele said it would not be desirable to implement automatic shutdown logic at the valve or PLC (programmable logic controller) level. To perform a safe shutdown of a pipeline at a valve, it is necessary to communicate with the downstream station, but PLCs

don't communicate with each other; that happens at the SCADA level. 19527

Spill at Marshall during shutdown

Mr. Baumgartner confirmed that Enbridge had never had a Mainline rupture during shutdown so it had not trained its people to detect this. During a scheduled shutdown, there is an expectation for pressures to be dropping, flow rates to be dropping, those types of things. "You don't expect a pipeline to rupture in those situations where your pressures are decreasing. 19571

Ms. Griffith then turned to the containment capacity at the Kitimat terminal and NGP's statement in Exhibit B45-8 that "a scenario in which spill volumes at the terminal would exceed the capacity of both the tank lot containment and the remote impoundment reservoir capacities is not a credible design scenario."

She said that when asked whether the scenario where all the tanks at the terminal ruptured should be planned for, Northern Gateway said, "Well, that's not something that we need to think about" 19588

NEB's 2008 audit of Enbridge integrity and safety management

Ms. Griffith brought up as an AQ, a 2008 audit by the NEB of Enbridge's integrity and safety management programs. It had identified a number of "findings of non-compliance with areas needing improvement." According to Mr. Underhill, Enbridge filed its corrective action plan in March 2009, two months late. In January 2010 it met with the ENB to discuss the status of the plan, and "it was shortly after that that we submitted a summary of our completed actions." Ms. Griffith asked, "Shortly after?". Mr. Underhill replied, "It was January of 2011." 19599

Ms. Griffith reviewed some sections in the document, and a number of the findings. She then asked to have the 2008 NEB audit report put into the record as evidence. 19634

Mr. Langen said he will accept the motion on the condition that "the only evidence that can be referred to in argument is the evidence that comes out of the mouth of the witness." Ms. Griffith said that in the interest of saving time, she had not gone through all the various sections in the document and specific findings, but under Mr. Langen's terms, she will continue questioning on the audit. The Chairperson encouraged Ms. Griffith to do so, and the motion has not been granted. Later, she asked Ms. Griffith to put the motion in writing.

Ms. Griffith continued, reading lengthy sections of the document into the record, and giving Mr. Kresic and others the opportunity for a full reply. This begins at 19709.

Replacing Line 6B

Mr. Kresic confirmed that the NTSB report (Exhibit 92-3) included a recommendation that Enbridge revise its integrity management program and that PHMSA also dictated specific remedial actions for Line 6B. Ms. Griffith asked about plans to replace segments of Line 6B. Mr. Kresic replied, "We are replacing … the entire Pipeline." 19814

Mr. Kresic said the motivation to replace the line is safety. He said the company is now taking a long-term view of maintenance and "on certain pipelines, like Line 6B, which would require a high volume of ongoing maintenance compared to other pipelines, because of that higher volume, it was more cost effective for us to simply replace.

Cleanup costs in the US vs Canada

Ms. Griffith attempted to ask questions about the cost of cleanup for the Marshall spill, but was discouraged by Mr. Langen and the Chairperson. 19877

She said that her questions were related to insurance. She was allowed to try her questions with Dr. Ruitenbeek, whom she asked about cost differences between the US and Canada for cleanup and compensation. Dr. Ruitenbeek had said on October 17 (Vol 92), that the differences "were due in large part to different legal standards dealing with compensation in the United States versus those in Canada."

In reply to Ms. Griffith, he said, "aggregate spill cleanup costs -- and I'm speaking of the direct costs of cleanup -- are, let's say about three times larger in the United States than in other jurisdictions." "The literature does not generally break down different categories of costs to a great deal of detail. For example, most of the cost estimating data, which are in my earlier evidence, simply provides aggregate information."

"Some of it is perhaps the higher legal costs, but it is not all directly attributable to the legal differences." 19903

Ms. Griffith wrapped up this exchange as, "Your evidence is that costs in the U.S. are typically about three times higher than in Canada but that this is not necessarily the result of different legal standards from dealing with compensation; is that correct? Dr. Ruitenbeek: "That's correct." 19909

Asking about possible areas of difference between the US and Canadian costs, Ms. Griffith referred to a figure of $42 million for the federal costs incurred in Michigan; a natural resource damages assessment (NRDA) which exists in the US, but not in Canada; there may be Aboriginal claims; 20% increment for remote spills and those near water. Dr. Ruitenbeek was unable to provide clarity on most of these.

Dr. Ruitenbeek confirmed for Ms. Griffith that $250 million of insurance for Northern Gateway was still "basically a target." The $200 million valuation of potential environmental damages of a major spill had been derived from Mr. Anielski's report and according to Dr. Ruitenbeek was still valid and not likely to be revised. 19982

Kitimat River Valley terrain

Ms. Griffith ended the day surveying a number of questions about challenging risk factors with the Kitimat River, the valley and estuary, including remoteness, ruggedness, flow and velocity rates and volatility of changes, tidal range. The river hosts a hatchery and is the water supply for Kitimat. She compared some of these characteristics or factors in the Kitimat to the Kalamazoo River where its highest discharges are less than the Kitimat. 20017