Enbridge Northern Gateway Project
JRP Hearing Notes

Day 21 – October 13 2012 – Prince George

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Enbridge Northern Gateway Pipelines Panel #2

Pipeline and Terminal Design and Engineering Panel

Ray Doering	Peter Acton	Barry Callele
Drummond Cavers	Tom Fiddler	Shane Kelly
Clive Mackay	James Mihell	Peter Wong

Examinations

Hugh Kerr for the United Fishermen and Allied Workers' Union 9482
Doug Beckett 9920
Terry Vulcano 10139
Josette Wier 10391

Examination by Hugh Kerr for United Fisherman and Allied Workers Union 9482

Dr. Kerr's questioning addressed detailed technical matters. Our notes will identify the topics and the paragraph numbers in the transcript at which the discussions begin.

Size of a spill

Basing his calculations on the maximum design rate of the oil pipeline of 583,000 barrels per day and 13 minutes to complete shutdown of the pipeline, Dr. Kerr calculated that 5,261 barrels of oil would be spilled in a full bore rupture event. 9483

Mr.Doering confirmed that 583,000 bpd is the facility NGP is seeking approval for. He noted that when they do this calculation, they use 1.5 minutes for the valve closure, rather than 3 minutes and 11.5 minutes to shutdown, because "flow rate is dramatically reduced very quickly as you start to close the valve." But, he agreed withDr. Kerr's arithmetic.

Dr. Kerr attempted to visualize how that much oil might behave in a small stream if it all spilled into the stream and its impacts on salmon. "How long would that spill then be?" Mr. Doering said it depends on stream velocity. The question about impacts on salmon is deferred to the Environment Panel.

Toughness of the pipe

These questions relate to the steels used, pipe purchase specifications, welding techniques, and testing procedures. The discussion is for the most part detailed, technical, and difficult for lay readers. Those interested should follow in the transcript. 9578

Pipe purchase specifications

Mr. Mihell stated that Enbridge "may order Category 2 pipe for certain circumstances or for the entire length of the pipe. However, CSAZ662 make provision for the use of Category 1 pipe for oil pipelines." Category 2 pipe "has notch-toughness and fracture appearance properties specifically to guard against fracture propagation, [whereas] fracture propagation in an oil pipeline doesn't present a realistic threat." 9614

Charpy V testing and CTOD testing

The two testing methods test for different aspects of steel and pipeline toughness. Enbridge typically does not do Charpy V tests on welds, but does routinely use CTOD. Charpy V and its applicabilitiy is described at 9639. CTOD (Crack Tip Opening Displacement or J Integral tests) is explained at 9646.

Mr. Mihell explained, "You would perform Charpy V testing in -- such that the fracture face is oriented in -- along the pipe access to address things such as fracture propagation events. You would perform CTOD tests with the fatigue pre-notch oriented in a hoop direction to address the potential for girth weld defects." 9678

Dr. Kerr suggested that a Charpy V type test might be applicable following a seismic event. Mr. Mihell disagreed, and that shaking due to a seismic event is not the thing that might present a threat to a pipeline. The real threat is related to large scale strain-based failures of the pipe, where the location is on unstable ground, especially on grounds that are associated or prone to soil liquefaction. 9679

Tie-in manual welds & testing

Dr. Kerr asked how they test manual welds, particularly on tie-in welds, joining long lengths of pipe to already-welded pipelines. Mr. Mihell replied that CTOD testing is done

on mechanized welds, and not for manual welds. Many details on manual welds, procedures, and tests begins at 9705.

For manual welds on the 36 inch pipe in NGP, “definitely” three and perhaps four welders would be welding simultaneously, according to Mr. Fiddler.

The subsequent conversation is more detailed and technically specific, without a resolution, or even, frequently, the two individuals, Dr. Kerr and Mr. Mihell, talking about the same thing. 9751-9916

Examination by Doug Beckett 9920

LiDAR

Mr. Beckett’s questioning is mainly about the use and usefulness of LiDAR (Light Detection and Ranging) optical remote sensing in the detection and analysis of terrain.

He asked Mr. Cavers about his qualifications with respect to LiDAR, and specifically what experience or authority he or other panel witnesses had using LiDAR, in the project area, for identifying landslides or assessing the likelihood and risk of landslides. “Have you personally identified landslides, using LiDAR, in areas where traditional assessment approaches have failed to identify the landslide?”

Mr. Cavers said that compared to field-work, “crawling along on our hands and knees,” the outcome is about “one-on-one with the LiDAR.” Compared to conventional air photography and orthoimages, his answer is “yes”. Mr. Beckett said, “I take that as a “qualified no.”

Mr. Beckett asked about the default width of LiDAR coverage of 1 kilometre. Mr. Cavers said that is applicable in most areas, such as Alberta, but where hazards that may affect the pipeline extend beyond that distance, they do widen out the LiDAR coverage. 9968 “The simple matter is that where we need more LiDAR, we will get more LiDAR” 9987

Mr. Beckett and Mr. Cavers agreed that LiDAR is useful for identifying small streams and other geotechnical hazards, including active faults, unstable terrain, even spills.

Mr. Beckett also asked a few questions about climate change, materials strength, and what happens to the contents of the pipeline if it does spill.

Examination by Terry Vulcano 10139

Spreads and the construction schedule

Mr. Vulcano stated that he is going to ask about “spreads” and the construction schedule. Exhibit B8-2 says this, “Actual project construction will involve various work crews constructing the pipelines (including tunnels), pump stations and the Kitimat Terminal. Construction plans include the pipelines being constructed in 12 spreads under three contracts. Three pipeline crews will operate concurrently, moving from spread to spread, with most of the construction occurring over two years (see Table 4.4-15). Table 10-3

Pipeline Construction Spreads in the Application, Vol 3, Exhibit B1-5 explains where the spreads are located on the pipeline route.

Mr. Doering and Mr. Fiddler provided explanations and descriptions as to how the spreads and work programs are conceived to unfold and be scheduled and managed.

Table 4.4-15 Pipeline Spreads and Construction Schedule

Contract	2014–2015 Winter 1	2015 Summer 1	2015–2016 Winter 2	2016 Summer 2
1	Spread 3 93.0 km	Spread 1 192.0 km	Spread 2 87.9 km	Spread 6 74.1 km
2	Spread 9 99.6 km	Spread 10 79.8 km	Spread 8 88.5 km	Spread 7 94.2 km
3	Spread 4 103.4 km	Spread 11 78.9 km	Spread 5 81.5 km	Spread 12 99.3 km

NOTE:
Summer is June to November; winter is December to April.

Mr. Vulcano asked where the work crews will come from. Mr. Fiddler replied that NGP will put some conditions on the contractors such as "minimum 15% Aboriginal workforce in construction" or "the communities we expect them to consult with and have opportunity for engagement." Then the contractors will propose that "We expect 50% of our workforce will come from our union halls locally in Alberta." 10205

Mr. Vulcano asked if a contractor will take his crew with him when he moves from one spread to another. Mr. Fiddler said, "Yes, absolutely" and described some of the considerations with accommodations, locations, and seasons. 10215

Scheduling constraints and practical limits

Mr. Vulcano asked whether they had considered using one contractor instead of three. Mr. Fiddler said it would take six years to complete. NGP could not tolerate that for reasons he and Mr. Doering described. Mr. Fiddler also mentioned a construction capacity constraint: "The reality is in Canada right now, there is only one large bore contractor with two pipeline spreads capability." 10260

Employment of Women

Mr. Fiddler said that NGP had no objectives with respect to women, but that the contractors might, as might the four pipeline contractor unions, including the Christian Labour Association of Canada. "We don't interfere with their objectives or their methods of recruitment and attraction." 10310

Examination by Josette Wier 10391

Dr. Wier is the first intervenor to call in remotely. There were numerous audio glitches.

Corrosivity of dilbit

Dr. Wier said that her questions would be about the Semi-Quantitative Risk Assessment (SQRA) (Exhibit B75-2). She asked about US regulatory concerns with the safety of

transportation of dilbit, specifically with corrosiveness.

Mr. Mihell replied that "the most comprehensive discussion" is in NGP's reply to Haisla IR2 (Exhibit B45-8). He said that they found another Enbridge pipeline, Line 4, referred to as the "analog line",which was similar to Northern Gateway, transported dilbit, and could provide "10,000 kilometre years's worth" if inline inspection data. They found no corrosion at all.

10,000 kilometre yeas worth of ILI data

Dr. Wier said that "10,000 kilometre years" didn't speak to her. How long was Line 4? When was it built? When and how much of it was inspected? Mr. Mihell said it was 1000 km, built in 1999, all of it was inspected, once in 2007 and once in 2010. 10507

Frequency of inspections

Noting that Line 4 wasn't inspected until its eighth year, Dr. Wier asked if this was common practice. Mr. Mihell said that inspection intervals had been reduced, and that with NGP the first inspection would be done within the first two years

There is more than a crack to a crack.

Dr. Wier reviews conclusions from the NTSB investigation (Exhibit B92-3) 10574
Mr. Mihell states that "the root cause of the actual release at Marshall was environmentally assisted cracking and not technically an operations related failure" and the SQRA assigns a very low failure frequency to operations. At Marshall, "the rupture risk associated with incorrect operations was considered to be zero." 10619

Dr. Wier replied, "It's the failure of the integrity management system and the whole corporate structure around it. … There is more than a crack to a crack. It's what led to the crack and what's been ignored and all the warnings and so on." 10624

Quality assurance and inspections of contractors

Dr. Wier quoted from her own written evidence (Exhibit D217-21) about "Enbridge's more than 500 construction permits violations in Wisconsin in 2007-2008". She asked, "How are you going to assure us that you're going to do better than four years ago?" Mr. Fiddler said that this is a matter for the Operations Panel, and all he can do, "is reassure you by our follow-up activities." 10646

Whistleblowers and a culture of deviance

On October 11, the NEB sent a letter to Trans Canada regarding allegations made by a former employee, of regulatory non-compliance at TransCanada. Many of the allegations were verified. Dr. Wier said, "It's very distressing to see that the regulator had not flagged those non-compliances and that it takes a whistle-blower, at great costs I'm sure to that person, to uncover them." 10680

Using a phrase from the NTSB investigation of Enbridge's Michigan spill, Dr. Wier asked her final question, "What is Northern Gateway prepared to offer as a clear and robust indication that it has outgrown its [own] corporate culture of deviance?" 10691