

December 21, 2015

**VIA COURIER and ELECTRONIC MAIL**

Ms. G. Cheryl Blundon, Board Secretary  
Board of Commissioners of Public Utilities  
120 Torbay Road  
P.O. Box 21040  
St. John's, NL A1A 5B2

Dear Ms. Blundon:

**Re: Amended General Rate Application of Newfoundland and Labrador Hydro – Prudence Review**

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Enclosed are the original and twelve (12) copies of the Final Submissions on Prudence Review of Vale Newfoundland & Labrador Limited.

We have provided a copy of this correspondence together with enclosures to all concerned parties.

We trust you will find the enclosed satisfactory.

Yours faithfully,



Thomas J. O'Reilly, Q.C.

TJOR/js  
Encl.

c.c. Geoffrey P. Young, Newfoundland & Labrador Hydro  
Gerard Hayes, Newfoundland Power  
Thomas J. Johnson, O'Dea, Earle  
Paul Coxworthy, Stewart McKelvey  
Dennis Browne, Q.C., Browne Fitzgerald Morgan & Avis  
Nancy Kleer, Olthuis, Leer, Townshend LLP  
Yvonne Jones, MP Labrador  
Genevieve M. Dawson, Benson Buffett  
Fred Winsor, Sierra Club Canada  
Roberta Frampton Benefiel, Grand Riverkeeper® Labrador Inc.  
Danny Dumaresque

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**IN THE MATTER OF** the *Electrical Power Control Act, 1994*, S.N.L. 1994, Chapter E-5.1 (the “EPCA”) and the *Public Utilities Act*, R.S.N.L. 1990, Chapter P-47 (the “Act”), as amended and regulations thereunder; and

**IN THE MATTER OF** a General Rate Application filed by Newfoundland and Labrador Hydro on July 30, 2013; and

**IN THE MATTER OF** an amended general rate application filed by Newfoundland and Labrador Hydro on November 10, 2014; and

**IN THE MATTER OF** a prudence review relating to certain actions and costs of Newfoundland and Labrador Hydro.

## **VALE NEWFOUNDLAND & LABRADOR LIMITED FINAL SUBMISSIONS ON PRUDENCE REVIEW**

The Prudency Review portion of Newfoundland and Labrador Hydro’s (“Hydro”) Amended 2013 General Rate Application considered the prudency of 11 projects and programs completed by Hydro between 2013 and 2015. The majority of the programs/projects were associated with outages in January 2013 and January 2014 on Hydro’s Island Interconnected System (“IIS”).

In its July 6, 2015 report (“Liberty’s Initial Report”) and its September 17, 2015 reply (“Liberty’s Reply Report”) to Hydro’s August 7, 2015 submission (“Hydro’s Prudency Reply”), Liberty Consulting Group (“Liberty”) concluded that Hydro’s “decisions and actions were imprudent in seven of the eleven projects or programs” and identified “adverse cost consequences associated with six of these seven projects or programs”.<sup>1</sup> In Liberty’s Initial Report, Liberty identified in excess of \$25 million in capital and operating costs between 2013 and 2015 that were caused or contributed to by Hydro’s imprudence.

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<sup>1</sup> Liberty Report p 26, p. ES-2.

Vale Newfoundland & Labrador Limited (“Vale”) did not retain its own expert to investigate the programs and projects at issue in the Prudency Review but participated in the hearing process through the filing of Requests for Information (“RFI”) and cross examination of witnesses. Vale supports the findings of Liberty and submits that Hydro, despite its reply evidence and its presentation of evidence at the Prudency Review, did not establish that any of Liberty’s findings of imprudence were incorrect.

One of the primary issues addressed at the Prudency Review was Hydro’s systemic failure to adhere to its own preventative maintenance programs. As stated in Liberty’s Initial Report:

Good utility practice requires a structured and comprehensive approach to maintenance. Such an approach identifies and provides for the regular performance of inspection and repair activities designed to keep equipment in good working order, prolong its life, and protect against service failures with material consequences. Those consequences can include either or both avoidable damage to equipment and disruption of service to customers. Good practice calls for the identification of appropriate cycles for the performance of recurring maintenance activities. Those cycles need to consider factors unique to the utility’s particular circumstances. Those factors include equipment configuration, its condition, and the environment in which it operates. Hydro, for example, generally operates comparatively aged equipment, which tends to decrease maintenance cycle length.<sup>2</sup>

Prior to the January 2014 outage, Hydro used a six year preventative maintenance cycle for transformers and air blast circuit breakers. While this cycle period is within acceptable industry standards, the evidence demonstrates that Hydro repeatedly failed to comply with its own preventative maintenance schedule despite Hydro’s witnesses repeatedly stating that Hydro is fully committed to preventive maintenance.

As noted by Liberty and discussed by Hydro’s witnesses during the Prudency Review, in 2009, Hydro recognized that it was falling behind on its preventative maintenance schedule and developed a plan to catch up on its preventative maintenance by the end of 2015.<sup>3</sup> As demonstrated in Hydro’s response to RFI V-NLH-89 Rev. 1, Hydro started to fall behind on its accelerated preventive maintenance schedule within a year of its development. By the end

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<sup>2</sup> Liberty Report p 25.

<sup>3</sup> Liberty Report p 26; Hydro’s Reply Submission, p.4; Hydro’s preventative maintenance and corrective maintenance program is outlined in PUB-NL-378 and 379;

of 2013, 27 transformers and 18 air blast circuit breakers were overdue for preventative maintenance.<sup>4</sup>

Hydro has defended its decision to defer preventative maintenance on the basis that such deferrals were necessary to address more critical corrective maintenance work.<sup>5</sup> However, as stated by Liberty, while the occasional deferral of preventative maintenance to address emergency critical work may be appropriate, the need to address critical issues is not a justification to repeatedly and systematically defer preventative maintenance work.<sup>6</sup> Further, while Hydro points to a “significant increase in corrective maintenance and capital work in 2013”<sup>7</sup> as a reason it fell behind on preventative maintenance, the evidence demonstrates that Hydro failed to meet the targets of its catch up preventative maintenance program in each of the three years before 2013.<sup>8</sup> With respect to Hydro’s suggestion that its deferral of preventative maintenance conformed to good utility practice, Liberty’s Initial Report stated:

Liberty disagrees with Hydro’s view. The widespread deferral of preventative maintenance work by Hydro was not well planned, carefully executed, or consistent with good utility practice. We begin by observing that, particularly with respect to air blast circuit breakers, the equipment was of very advanced age. Advanced age, which is characteristic of Hydro’s equipment, calls for increased, not decreased maintenance. Hydro appears to have recognized that as well, acting in 2010 to implement a catch-up program on breaker work. As our evidence notes, and as Hydro essentially acknowledges, this effort to displace other priorities itself came quickly to be displaced in turn by other priorities. We have seen and Hydro has supplied in its evidence no basis for concluding that its decision to abandon the catch up program in favor of other priorities resulted from a structured assessment of risks, priorities, or likely consequence. As our report notes, and as Hydro’s reply evidence does not dispute, it did not even establish dates for finally performing the maintenance deferred.

A widespread deferral of preventative maintenance, the failure to support it with clear, persuasive assessments of comparative cost, risks, and benefits among the work considered for advancement or deferral, and the omission of an effort event to assign dates for deferred work is not in accordance with good asset management practice.<sup>9</sup>

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<sup>4</sup> See GRA Transcript October 29, pp, 151-159 for questioning on this issue.

<sup>5</sup> PR-PUB-NLH-052 and 167.

<sup>6</sup> Liberty Report pp. 26-28.

<sup>7</sup> PR—PUB-NLH-167

<sup>8</sup> V-NLH-89 Rev. 1.

<sup>9</sup> Liberty’s Reply Report dated September 17, 2015, p. 2 and 3 (the “Liberty Reply Report”).

Liberty also noted a flaw in Hydro's logic based on the fact that Hydro's deferral of preventative maintenance would itself cause the need for corrective maintenance that Hydro used to justify the deferral.<sup>10</sup> Rather than defer preventative maintenance because of unexpected corrective maintenance, Hydro could and should have, retained a third party contractor to complete this work before 2013.<sup>11</sup> As confirmed by Hydro during cross-examination, when this work was put to tender in 2014, Hydro received a "number of bids" from outside contractors to do the work.<sup>12</sup> Had Hydro retained a contractor sooner, the events of January 2013 and January 2014 may have been avoided.

The evidence presented at the GRA also demonstrated that Hydro did not have an adequate system for documenting its decisions to defer preventative maintenance or guidelines for the criteria on which such decisions should be based.<sup>13</sup> While Hydro has stated that it relied on the "engineering judgements"<sup>14</sup> of its technicians to make deferral decisions and has demonstrated a "considered approach to the deferral of preventative maintenance",<sup>15</sup> the evidence demonstrated that these decisions were not documented and were not regularly reported to Hydro's executives. As pointed out in Liberty's Reply Report: "there remains.... no evidence of any form of structured or significant analysis of the risks of deferring maintenance versus the rewards of redirecting expenditures elsewhere".<sup>16</sup>

Since the events of January 2014, Hydro has introduced a "management of change form" that has to be signed off on by all employees involved in a decision to defer preventative maintenance. In addition, reporting on preventative maintenance back logs has changed from a verbal monthly report to a weekly written report that goes all the way to the CEO.<sup>17</sup> When asked if the backlog of preventative maintenance would have been dealt with before

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<sup>10</sup> Liberty's Reply Report, p. 5.

<sup>11</sup> Hydro explained its justification for failing to hire contractors in its cross examination at GRA Transcript October 27, pp. 163-165. Hydro also acknowledged, at GRA Transcript November 2, pp, 73-75, that there was no regulatory requirement preventing it from retaining contractors to do this work prior to 2014.

<sup>12</sup> GRA Transcript October 29, p, 187.

<sup>13</sup> GRA Transcript October 27, pp, 200-203.

<sup>14</sup> Hydro's Surrebuttal evidence dated October 14, 2015, p. 3 ("Hydro's Surrebuttal").

<sup>15</sup> Hydro's Surrebuttal, p. 2.

<sup>16</sup> Liberty's Reply Report, p. 8.

<sup>17</sup> GRA Transcript October 28, pp, 32-34; GRA Transcript October 29, pp, 106-108.

the events of January 2014 had the current documentation and reporting structure been in place before those events, Mr. Rob Henderson stated:

I would suggest it would have been much more, I'll say, proactively dealt with in the sense it would have been a clear view to address it, and that's why we made the change that we did.<sup>18</sup> [emphasis added]

As noted by Liberty, the failure to comply with a preventative maintenance schedule is especially concerning on the IIS where many of the transmission and generation assets are nearing the end of their useful life. While it may not have been possible to establish that the failure to adhere to preventative maintenance schedules caused each of the failures at issue in the Prudency Review, Hydro's decision to defer preventative maintenance "deprived Hydro of the opportunity that regular maintenance is designed specifically to provide *i.e.*, to identify and correct potential sources of equipment failure".<sup>19</sup>

As discussed below, in a brief synopsis of each of the projects and programs found by Liberty to be imprudent, the failure to adhere to a preventative maintenance schedule on an aging system caused or materially contributed to the requirement for Hydro to incur significant operating and capital costs between 2014 and 2015.

#### 1. Sunnyside Replacement Equipment:

The January 4, 2014 failure of the Sunnyside T1 transformer and the subsequent failure of the Sunnyside air blast circuit breaker B1L03 to open in response to the fault caused a fire that damaged the Sunnyside T1 transformer and nearby equipment. While a root cause for the failure of airblast circuit breaker B1L03 could not be identified,<sup>20</sup> Liberty found that Hydro's systematic failure to adhere to transformer and breaker preventative maintenance schedules "deprived Hydro of the opportunity to identify and address the causes of the transformer and breaker failures before they occurred".<sup>21</sup> In Liberty's Reply Report, Liberty

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<sup>18</sup> GRA Transcript November 2, pp, 52.

<sup>19</sup> Liberty Report p. 27

<sup>20</sup> Hydro's Reply Submission p. 11.

<sup>21</sup> Liberty Report pp. 24-31

noted that breaker B1L03 was seven years past its life expectancy at the time of the failure and that it is reasonable to conclude that there is a correlation between the performance of preventative maintenance and failure in an asset operating beyond its expected life.<sup>22</sup> Liberty also found that the omission to install breaker failure protection prior to the incident and the failure to follow up on increasing acetaldehyde gas readings in the transformer were imprudent actions that caused or potentially contributed to the failures.

In response to the January 2013 fire, Hydro replaced the fire damaged equipment and installed an additional breaker with breaker failure protection. The capital costs associated with this work totaled \$3,236,684 (net of insurance recovery) in 2014 and additional work in 2015 is estimated to bring the total to \$5,145,800. In addition, Liberty has identified net operating expenses of \$879,800 in 2014 and \$133,285 in 2015 associated with this project.<sup>23</sup>

Hydro has argued that the Board should not refuse recovery of the losses associated with the fire as there is no proof that the transformer's failure or the breaker's failure were caused by imprudent actions.<sup>24</sup> As pointed out by Liberty, Hydro's suggested approach to assigning responsibility for the consequences of a failure between the utility and its customers fails to recognize that the failure to conduct the maintenance, a task solely within Hydro's control, "deprived Hydro of the opportunity to identify and address the causes of the transformer and breaker failures before they occurred." As stated in Liberty's Initial Report:

Where causation is not determinable, despite good faith and capable effort, it is sufficient to make the categorical level connection, as exists here, between conducting maintenance and avoiding malfunction. To assign no consequence to imprudence under such circumstances, when adverse consequences have occurred, has the inevitable effect of lessening diligence and care in operating facilities required to serve the public and for which customers also bear cost responsibility.<sup>25</sup>

When asked to address Hydro's position on causation during direct examination, Liberty witness Mr. John Antonuk testified:

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<sup>22</sup> Liberty's Reply Report p. 3.

<sup>23</sup> Liberty Report p. 30, Table 5.3

<sup>24</sup> Hydro's Reply Submission pp. 9 and 10, Hydro's Surrebuttal pp 4-6.

<sup>25</sup> Liberty Report p. 28.

I believe it would unduly diminish the accountability that is necessary to ensure that utilities operate systems and perform public service responsibilities carefully, efficiently, and effectively. There's no doubt that effective maintenance reduces the risk of equipment failure. There's a clear and direct and substantial causal connection between good maintenance and good equipment performance, or conversely poor maintenance and poor equipment performance. Hydro owns and operates the kinds of equipment at issue here and has been for many decades. It performed what I think we can presume to be an effective analysis of the causes of the equipment failures on January 2014, save for the Sunnyside transformer failure, neither it nor its experts could find reasons that they're willing to stand behind. In summary, where does that leave us; I believe with three critical circumstances to keep in mind, (a) the causal connection between maintenance and performance is clearly established, (b) in our opinion, a failure to maintain properly has also been clearly established, and (c) the owner operator, in this case Hydro, who would presumably benefit from a finding of causes beyond its control, hasn't been able to do so even after extensive opportunity and investigation at the time, and a continuing opportunity since to do further examination if it believed it were appropriate. Those three circumstances, I think, raise the following question that the Board needs to decide; under those circumstances, is it reasonable to compel the Board on the one hand, or customers on the other hand, to establish cause with definiteness before determining that it's Hydro rather than customers who should bear the consequences of its failure to act prudently in maintaining its equipment.<sup>26</sup>

Further, during Liberty's cross examination by the Consumer Advocate, the following exchange took place:

MR. ANTONUK:

- A. I think one of the purposes of regulation is to induce the kind of performance, the competition imposes on market participants, discipline. And that discipline is to act prudently and effectively. When you get a situation—this isn't a situation where there's no causal connection established whatsoever. There is a direct causal linkage between maintenance and performance.

JOHNSON, Q.C.:

Q. Right.

MR. ANTONUK:

- A. What we can't do is say whether that linkage is what was the direct cause in this given incident. From a practical matter, I think what we have to say is, if Hydro can sit back and say someone else has to prove that this direct causal linkage was overtaken by some other event, how does that make sense? They run the equipment, they manage the equipment, they work with the people who know this equipment; they retain these people. There were some quotes about the AMEX report made in cross-examination. The thing that wasn't mentioned was

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<sup>26</sup> GRA Transcript November 12, pp, 57 and 58.

the statement that said I can't find a root cause here. In that case, I think the question is this: when you establish a very clear pattern of poor performance here with respect to maintenance, do you really want to say to customers nobody can come up with "the" specific cause for "this" specific incident, including the people who run and maintain this equipment, including their experts and including their own analysis. Do you really want to say it's up to customers or the Board to step in and prove cause, or do you want to say we've established a pattern of conduct that is so clear here that imposing discipline on the utility to do its job requires us to say we are going to put this cost on your ledger and not on customers' ledger, that's the policy issue, I think.<sup>27</sup>

In addition to challenging Hydro's position on causation, Liberty states that the completion of regularly scheduled preventive maintenance or prudently following up on increasing acetaldehyde gas levels may have avoided the failure. In Liberty's Initial Report, Liberty points out that, with respect to transformer T1, preventative maintenance would have included power factor testing that could have identified the bushing problem that led to the January 4, 2014 failure.<sup>28</sup> In its response, Hydro relies on the fact that a power factor test was conducted in 2007, more than six years before the failure.<sup>29</sup> Reliance on a test that occurred more than 6 years before the failure and arguing that there is no proof that a test that was not done would have identified a problem with the bushings obfuscates the issue. The onus cannot be on the customers to prove what the power factor test would have shown, the issue is that Hydro failed to take reasonable steps to protect itself and ratepayers from the consequences of failure by conducting the preventative maintenance testing on schedule.

Liberty also found that Hydro's failure to follow up on increasing acetaldehyde gas levels in Transformer T1 based on an understanding that the levels were caused by leaking from the tap changer was also imprudent.<sup>30</sup> While Hydro did discuss the issue with the manufacturer and subsequently confirmed that a different transformer had a leak between the transformer's oil and its tap changer compartments,<sup>31</sup> Hydro did not perform any test to confirm the source of the gas in T1 despite the gas reaching its highest recorded level in

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<sup>27</sup> GRA Transcript November 12, pp. 175-177.

<sup>28</sup> Liberty Report pp. 28 and 29.

<sup>29</sup> Liberty's Reply Report p7.

<sup>30</sup> Liberty's Reply Report p. 9 and 10.

<sup>31</sup> Hydro's Reply Submission p. 12; PR-PB-NLH-023.

September 2013.<sup>32</sup> At the hearing, Liberty also pointed out that Hydro contributed to such leaking by failing to replace the gasket between the transformer and the tap changer.<sup>33</sup> Further, while Hydro has stated that “there was no indication that the Sunnyside T1 transformer had a specific issue that took the levels outside of the range historically seen on these units”,<sup>34</sup> the evidence presented at the hearing confirmed that the 2013 reading of 11 ppm was the highest ever recorded on that transformer and warranted a decision to follow up with further testing in 2014.<sup>35</sup> Unfortunately, the transformer failed before any follow up test was completed.

Vale submits that Hydro has not refuted Liberty’s findings of imprudence or standard for establishing causation. As such, the costs associated the January 4, 2014 fire should not be recoverable as part of the 2014 test year or the 2015 test year. As the new assets will have a longer life than the ones that were replaced, as discussed below, capital costs associated with replacing the damaged transformer should be recoverable in the first rate case brought by Hydro following the replaced transformer’s expected end of life.

## 2. Western Avalon Terminal Station T5 Tap Changer Replacement

On January 4, 2014, in response to widespread outages on the IIS, Hydro attempted to energize the Western Avalon Terminal Station T5 Tap Changer. When this was attempted, the tap changer failed causing damage to the tap changer and Transformer T5.<sup>36</sup> At the time of the failure, the transformer was two and half years overdue for preventative maintenance.<sup>37</sup> Liberty found that Hydro’s systematic failure to adhere to transformer and air blast circuit breaker preventative maintenance schedules deprived [Hydro] of the opportunity to identify and address the cause of the failure before it occurred. Vale submits that Hydro has not refuted Liberty’s findings of imprudence and, as such, the costs

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<sup>32</sup>Liberty Report p. 29; GRA Transcript October 30, pp, 67 and 68.

<sup>33</sup> Liberty Report p. 29; GRA Transcript November 12, pp. 45 and 46.

<sup>34</sup> Hydro’s Surrebuttal p. 7.

<sup>35</sup> GRA Transcript November 2, pp, 64 and 65; GRA Transcript November 12, p. 45.

<sup>36</sup> For a detailed discussion of this issue, see pp. 32 -34 of the Liberty Report.

<sup>37</sup> Liberty Report p. 33.

associated with the January 4, 2014 failure of the T5 Tap Changer should not be recoverable.

### **3. Overhauls of the Sunnyside B1L03 and Holyrood B1L17 230 kV Breakers**

On January 5, 2014, the day after the Sunnyside air blast circuit breaker B1L03 failed, Sunnyside air blast circuit breaker B1L17 failed causing another widespread power outage on the IIS. As noted above, Liberty found that the failure of Sunnyside air blast circuit breaker B1L03 was caused or contributed to by Hydro's failure to perform preventative maintenance. As is the case with the failure of Sunnyside Transformer T1, Hydro argues that the failure to "prove" that the failure of breaker B1L03, which was "outside of the general six-year maintenance cycle by five months at the time of the Sunnyside incident", was caused by the delay in maintenance means that its failure cannot be the basis for financial consequences for Hydro.<sup>38</sup> However, as previously noted, Liberty rightly points out that imposing such a standard places the onus of proving causation on the customers who had no control over whether the maintenance was completed and also fails to recognize the lost opportunity to correct any maintenance issues resulting from delaying preventative maintenance. Hydro also argues that the breaker was experiencing cold weather conditions at the time of failure and that such conditions have been found to cause performance problems.<sup>39</sup> However, it must be borne in mind that the temperatures experienced at the time of the failure were well within the breaker's operating limits. There is no evidence that cold weather was the cause of the failure and, in the absence of evidence to the contrary, it is fair to assume that a breaker that has not been properly maintained is more likely to fail in cold conditions than a properly maintained breaker.<sup>40</sup> Vale submits that Hydro has not refuted Liberty's findings that the failure of air blast circuit breaker B1L03 was caused or contributed to by Hydro's imprudence.

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<sup>38</sup> Hydro's Reply Submission p. 13.

<sup>39</sup> Hydro's Reply Submission p. 13; See GRA Transcript November 2, pp, 75-83

<sup>40</sup> Liberty's Reply Report p. 10.

Hydro also notes that, at the time of its failure, B1L03 was scheduled for replacement within a few years. On the basis of reports by Gannett Fleming Inc. dated August 7, 2015 and October 13, 2015, Hydro submits that, even if the Board were to find that the breaker's failure was caused by imprudence, the financial consequences suggested by Liberty are overstated as they fail to account for betterment.<sup>41</sup> Liberty takes the position however that betterment should not be applied in the current GRA. Rather, to ensure that today's customers are not penalized, the new breaker should be placed into the rate base at the first rate hearing to blowing the date on which breaker B1L03 was scheduled to be replaced.<sup>42</sup> When asked to address Gannett Fleming's position on betterment, the following exchange between Board counsel and Liberty's witness occurred:

GREENE, Q.C.:

Q. I want to turn now to another issue, and that's the issue that we have called "betterment". Hydro has offered evidence suggesting that the equipment replacements and repairs at Sunnyside and Western Avalon have resulted in a betterment and that customers should pay for this betterment. Mr. Antonuk, do you agree that betterment has a role here?

MR. ANTONUK:

A. Betterment certainly has a role in some context, but it's just simply the wrong way to look at the circumstances here. The right standard here is the customer should pay no more than they would have in the absence of destruction and damage caused by imprudence. To the contrary, the approach urged by Hydro witnesses would require customers to pay far more than they would have had the damage or destroyed equipment continued to serve. Customers have paid on the basis of the depreciated cost of that equipment which was installed decades ago. Hydro's proposal would substitute that with a much higher cost of equipment that is only needed due to imprudence, in our opinion. Even after, I'll call it discount, that Hydro's betterment approach would create for that equipment, its installed cost nevertheless remains far, far higher than that of the equipment lost. The resulting investment that Hydro proposes to put in rate base, therefore, not only doesn't fail to keep customers harmless, it actually puts them in a much worse position and causes them to pay much higher costs across the duration for which rates set in this proceeding are likely to be in effect.

GREENE, Q.C.:

Q. But how do you deal with the fact that customers will at some point in the future have access to equipment that Hydro would eventually have had to install, anyway?

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<sup>41</sup> Hydro's Reply Submission p. 14.

<sup>42</sup> Liberty's Reply Report pp. 11-14.

MR. ANTONUK:

A. Well, I think you have to start from the notion that charging customers far, far more in the next ten years in return for benefits sometime after that really isn't a bargain at all. There's a well-established rule for treating the cost, a well-established regulatory rule in principle for treating the cost of equipment that is not needed for the first years of its operation or its service life. That same rule should be applicable and is logically extendable to equipment that would not have been needed, but for imprudence. Simply under that rule, utilities carry the investment for the period during which it is not needed, and then place the equipment in rate base at then depreciated cost at the time it becomes needed and for the remainder of its life. Applying that rule, while basing current rates on the depreciated cost of the equipment before replacement and repair, provides a balanced approach that assigns to the company a fair and proper share of the cost of its imprudence.<sup>43</sup>

Vale submits that Liberty's position is consistent with holding a utility accountable for its imprudent actions while at the same time ensuring that today's ratepayers are held harmless from the effects of the utility's imprudence.

With respect to air blast circuit breaker B1L17, Liberty found that imprudent maintenance work on the breaker in February 2013 allowed ice to accumulate inside the breaker and that the ice caused the failure.<sup>44</sup> While Hydro defended its maintenance of breaker B1L17 in PR-PUB-NLH-66 by stating that it ensured that the breaker's receiver tank was "securely covered to address the issue of potential moisture ingress from snow and ice" during repairs,<sup>45</sup> it is clear that Hydro failed to do this properly as water did in fact enter the breaker and caused the failure. As such, Liberty concluded that the costs associated with overhauling these breakers should not be recovered.<sup>46</sup> Vale supports Liberty's findings.

#### 4. Extraordinary Transformer and Breaker Repairs

As discussed above, Hydro repeatedly failed to comply with the catch up preventative maintenance program schedule it developed in 2009. This failure caused or materially contributed to the outages experienced on the IIS in January 2013 and January 2014.

<sup>43</sup> GRA Transcript November 12, pp, 58-61.

<sup>44</sup> For a detailed discussion of this issue, see pp. 35 -37 of the Liberty Report.

<sup>45</sup> See also Hydro's Reply Submission p. 18; Hydro also testified, at GRA Transcript October 28, pp, 51-53, that it has installed drain valves on its breakers and has changed its maintenance procedure to include opening the valves to drain any water before the breaker is put back into service.

<sup>46</sup> The estimated costs associated with these failures is discussed at p. 37 of the Liberty Report.

Following the January 2014 outage, Hydro accelerated its preventative maintenance program to ensure that it would be caught up on breaker and transformer preventative maintenance by the end of 2015. Hydro has included 2014 costs associated with this catch up maintenance in its 2014 test year and is seeking to amortize \$1.2 million in estimated 2015 costs over 5 years.

As demonstrated by Liberty, Hydro's 2014 test year revenue requirement includes \$434,752 in overdue transformer preventative maintenance and \$468,263 in overdue air blast circuit breaker preventative maintenance.<sup>47</sup> As is shown in Hydro's response to V-NLH-89, these repairs were required because Hydro repeatedly failed to meet its own preventative maintenance schedules in the years prior to 2014. Had these repairs not been imprudently deferred, they would have been completed between general rate applications and, therefore, would not have been recoverable. Hydro should not benefit from its decision to defer maintenance work by recovering expenses that would not otherwise have been recoverable had they been prudently completed in a timely manner.

With respect to the deferral and recovery over five years of \$1.2 million in preventive maintenance and repairs of transformers and air blast circuit breakers, V-NLH-89 demonstrates that these repairs also were required because Hydro repeatedly failed to meet its own preventative maintenance schedules in the years prior to 2014. As with the 2014 catch up preventative maintenance costs, had these repairs not been imprudently deferred, they would have been completed between general rate applications and, therefore, would not have been recoverable. Hydro should not benefit from its decision to defer maintenance work by recovering expenses that would not otherwise have been recoverable had they been prudently completed in a timely manner.

It is also important to note that, as confirmed by Robert Henderson during his cross examination, costs associated with regularly scheduled preventative maintenance would have been included in the 2007 test year that formed the basis for rates set at Hydro's last

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<sup>47</sup> Liberty Report, p. 40; See also Grant Thornton pp. 78 for a discussion on costs associated with catch up maintenance.

general rate application.<sup>48</sup> If Hydro was also permitted to recover catch up preventative maintenance costs in the 2014 and 2015 test years, Hydro would in effect be receiving double recovery.

Even if the Board were to permit recovery of the costs associated with 2015 catch up preventive maintenance, in response to RFI V-NLH-89 Rev. 1, Hydro confirmed that it currently estimates the cost of these repairs to be \$763,000. Therefore, any deferral account should be limited to this amount.

## 5. Black Start:

As set out at length in Liberty's Initial Report, a series of decisions taken by Hydro, and a failure to report those decisions to the Board, left the Holyrood generation station without black start capability for an extended period of time.<sup>49</sup> The failure to have onsite black start capability significantly increased the length of the January 2013 IIS outage. At that time, Hydro was using Hardwoods, a particularly unreliable plant located approximately 20 km from Holyrood, to "black start" Holyrood. As explained by Liberty in its report, Hardwoods was not a viable alternative for providing black start to Holyrood.

In October 2013, in response to the January 2013 delay in restarting Holyrood as a result of not having onsite black start, the Board ordered that Hydro take steps to restore onsite black start for Holyrood. In response to the Board's order, Hydro leased and installed eight 1.25 mW diesel generators to provide interim black start capability at Holyrood with a plan to replace the diesel generators with the new Holyrood Combustion Turbine in 2015. The costs associated with leasing these units was approved in Board Order P.U. 38 (2013) but recovery of the costs was deferred. In total, Hydro is now seeking (i) to recover as part of its 2014 revenue deficiency, approximately \$992,000 in 2014 capital, depreciation, fuel and

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<sup>48</sup> GRA Transcript October 28, pp, 216-220.

<sup>49</sup> Liberty Report pp 48- 57.

O&M costs and (ii) based on a 5 year amortization of the lease to include in the 2015 test year \$1.05 million in lease costs and \$41,000 in depreciation.<sup>50</sup>

In a report dated August 7, 2015 (the “LaCapra Report”), LaCapra Associates, Inc. (“LaCapra”) defends Hydro’s decision to delay installation of onsite black start at Holyrood after the original Holyrood black start service was taken out of service in January 2012 as being reasonable. LaCapra takes the position that, even if Hydro had taken steps to immediately replace the Holyrood onsite black start in January 2012, it would not have been installed in time to prevent the January 2013 events.<sup>51</sup> LaCapra’s position however is contradicted by the fact that Hydro installed the current black start diesel generators within 8 or 9 months of the Board requesting that Hydro take immediate steps to find an onsite solution for Holyrood.<sup>52</sup> In fact, one month after the Board wrote to Hydro requesting that it take such action, Hydro estimated that it could install onsite black start “within 11 weeks of approval by the Board.”<sup>53</sup>

While it was not addressed by Liberty in its report, the timing of the installation of the new Holyrood Combustion Turbine, a project that Liberty concluded to have “significant weaknesses” but that did not rise to the level of imprudence, is also relevant to considering whether the costs associated with the lease and installation of the eight 1.25 mW diesel generators should be recoverable.<sup>54</sup> As confirmed by Hydro in its evidence, one of the primary reasons that a decision was made not to incur the costs of installing onsite black start at Holyrood earlier than July 2014 was the fact that the new Holyrood Combustion Turbine would provide onsite black start for Holyrood once installed.<sup>55</sup> Vale submits that the “significant weaknesses” in the supply planning process that led to the delay in purchasing the new Holyrood Combustion Turbine are relevant to the costs incurred in leasing the black start diesel generators. While the costs associated with the new Holyrood Combustion Turbine should be subject to recovery as a capital asset, the costs associated with the black

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<sup>50</sup> Liberty Report p. 57; PUB-NLH-113, 114 and 115.

<sup>51</sup> LaCapara Report p. 13.

<sup>52</sup> LaCapara Report p. 12.

<sup>53</sup> *Ibid.*

<sup>54</sup> Liberty Report p ES-2, pp 7-14.

<sup>55</sup> GRA Transcript October 27, p. 61; GRA Transcript November 5, p. 84.

start diesel generators, which were only incurred because Hydro failed to install the new Holyrood Combustion Turbine in a timely manner, should not.

As found by Liberty, Hydro's imprudent failure over an extended period of time to maintain onsite black start capability at Holyrood resulted in the leased diesel generators having "too short a used and useful period to justify the expenditures". Vale submits that Hydro has not provided evidence or a justification to refute Liberty's findings and, therefore, any costs associated with leasing and installing the eight 1.25 mW diesel generators should be removed from any permitted 2014 revenue deficiency recovery and the 2015 test year.

## **6. Holyrood Unit 1 Turbine Failure**

On January 11, 2013, a terminal station failure led to the isolation and tripping of all three units at Holyrood.<sup>56</sup> During this incident, adequate lube oil supply was lost to Holyrood's Unit 1 turbine-generator causing major damage to the unit and resulting in a prolonged outage on the IIS. A root cause analysis concluded that the primary cause of the inadequate lube oil supply was the failure of a DC lube oil system to function as intended. In Board Order P.U. 14 (2013), the Board approved capital expenditures of \$12,809,700 relating to this failure. Hydro subsequently reported to Hydro that actual 2014 capital costs (net of insurance) were \$5.5 million.<sup>57</sup> Hydro also reported \$2.4 million in 2014 operating costs and an estimated 2015 depreciation of \$1 million associated with this event.

The DC lube oil system was the "third and final line of defence" in a triple redundancy system for the supply of lubricating oil to the generator in the event of a trip.<sup>58</sup> As noted in Liberty's Initial Report, the fact that the failure of such a system produces catastrophic damage within minutes requires the utility to ensure that the system is highly reliable.<sup>59</sup>

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<sup>56</sup> For a detailed discussion of this issue, see pp. 58 -64 of Liberty's Initial Report.

<sup>57</sup> Liberty's Initial Report, p. 58; see also PR-PUB-NLH-129.

<sup>58</sup> Liberty's Initial Report, pp. 58 and 59.

<sup>59</sup> Liberty's Initial Report, p. 58.

When the Holyrood units tripped on January 11, 2013, Unit 1's primary AC lubricating oil motor failed with the trip and the Unit's secondary AC lubricating oil motor failed because of degraded voltage. As a result of the failure of the two primary systems, the DC lubricating oil motor's system started. However, the DC system was unable to reach the required speed necessary to supply an adequate amount of oil to the Unit. A root cause analysis completed after the failure concluded that the DC motor failed to reach the required speed as a result of (i) a third party vendor misaligning the motor adjustments when the motor was last maintained in 2009 and (ii) Hydro improperly setting the motor's resistor setting.

Hydro's contract with the third party vendor required the vendor to test the motor to ensure it would reach the required speed prior to returning it to Hydro.<sup>60</sup> Hydro has taken the position, based on an invoice reading "Assemble with new bearings, ran test OK"<sup>61</sup> and post incident confirmation from the contractor that "the relevant tests would have been carried out",<sup>62</sup> that the contractor had completed the test. However, testimony given during the hearing supports Liberty's conclusion that the test, if done properly, would have shown that the motor was not able to reach the required speed.<sup>63</sup> The fact that neither Hydro nor the contractor has been able to locate the test results, which were required to be provided to Hydro by the repair shop under the contract between those parties, provides further evidence that the test was not completed.<sup>64</sup> Vale submits that the evidence supports a finding that either the vendor did not complete the test or the test was completed improperly.

Perhaps more concerning is the fact that Hydro did not confirm that the test on this critical motor was properly completed prior to the motor being put back into service, Hydro's inadequate testing procedure allowed the misalignment to go undetected for several years prior to the loss. In particular, while Hydro regularly tested the DC motor to ensure that it was working, other than requiring its maintenance contractors to test the motor for speed

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<sup>60</sup> PR-PUB-NLH-182, Attachment 1

<sup>61</sup> PR-PUB-NLH-182 Rev 1

<sup>62</sup> PR-PUB-NLH-182 Rev 1

<sup>63</sup> See Liberty Reply Report p. 23-24; GRA Transcript November 2, pp. 34-40

<sup>64</sup> GRA Transcript October 27, pp. 118 and 119

after repairs, it never conducted any test to ensure that it was working as intended.<sup>65</sup> Hydro has since included such a test in its testing program.<sup>66</sup> While Hydro and La Capra both defended Hydro's testing procedure based on it being compliant with the original manufacturers testing instructions as provided in 1968,<sup>67</sup> Liberty nevertheless concluded that:

good utility practice and basic common sense dictates that any system test sequence should be designed and executed under the primary criterion that the system function as intended.<sup>68</sup>

.....

Hydro's asset management approach reflected in this program should encourage continuous questioning and testing of processes, with managers and technicians asking "why are we doing this," "is it effective," and how can we improve?" Had such an approach been functioning, which Liberty believes is a goal of Hydro's asset management initiatives, the inadequacy of the testing process would have been revealed.<sup>69</sup>

During cross examination, Phil DiDomingo of LaCapra suggested that the motor misalignments identified after the incident might have occurred "during transport" or "during installation".<sup>70</sup> Even if there were an evidentiary basis to this suggestion, the fact that the motor could become misaligned during transport or installation reinforces the fact that Hydro's testing procedure should have included a test to ensure that the motor would work as intended if needed in an emergency situation.

Vale submits that Hydro has failed to adequately refute Liberty's conclusion that the failure of the DC lube oil system was caused or contributed to by Hydro's imprudence in failing to (a) ensure that the third party vendor had conducted the required testing before the DC motor was put back into service, (b) improperly setting the DC motor's resistor settings and (c) failing to utilize a testing procedure that would confirm whether the DC motor would work as required if needed. Therefore, it is Vale's submission that any costs associated with this failure, including any costs associated with the residual vibrations issues experienced in

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<sup>65</sup> GRA Transcript November 3, p. 67-68.

<sup>66</sup> LaCapra Report, p. 18; <sup>66</sup> GRA Transcript October 27, pp. 123 and 124.

<sup>67</sup> GRA Transcript October 27, pp. 130.

<sup>68</sup> Liberty's Initial Report, p. 61.

<sup>69</sup> Liberty's Initial Report, p. 62.

<sup>70</sup> GRA Transcript November 2, p. 175; GRA Transcript November 3, pp. 61-63.

2014 as a result of the repairs, be removed from any permitted 2014 revenue deficiency recovery and the 2015 test year.<sup>71</sup>

#### **7. 2014 Revenue Deficiency & Supply Costs:**

Coincident with the GRA, Hydro is seeking recovery of its stated 2014 revenue deficiency and has filed a 2014 test year, based on seven months of actual costs and 5 months of forecast costs. In P.U. 58 (2014), the Board approved the creation of a deferral account in the amount of \$45.9 million but denied a request by Hydro that the stated deficiency be recovered from the balance in the Rate Stabilization Plan's Hydraulic Variance Account. In addition to recovery of the \$45.9 million, Hydro is seeking recovery of \$10 million in 2014 supply costs incurred in the first quarter of 2014.

As discussed in Liberty's Initial Report and in Vale's current submission and its Final Submission on the GRA dated December 23, 2015, the 2014 test year includes a significant amount of costs that were caused or contributed to the actions found by Liberty to be imprudent. A summary of the costs related to the imprudent actions is contained in Table 9.1 of Liberty's Initial Report and discussed at pages 42 to 47 of the report.

With respect to recovery and deferral of 2014 supply costs, Liberty found that Hydro acted prudently in calling upon its capacity assistance agreement with Corner Brook Pulp and Paper to purchase approximately \$6.2 million in electrical generation and in incurring an additional \$5.5 million in additional costs for energy from its gas turbines and diesels. In total, the net 2014 costs incurred by Hydro were estimated to be \$9,790,000.<sup>72</sup> However, while the decision to purchase the power was prudent, Liberty concluded that the imprudent actions by Hydro led to the four day outage of Holyrood Unit 1 necessitating the purchase of \$2,189,110 in electrical power from Corner Brook Pulp and Paper between January 5 and January 8.<sup>73</sup> While Hydro has attempted to challenge the assumptions on which Liberty's

<sup>71</sup> A summary of the costs are contained in Liberty's Initial Report at p. 65, Table 11.2.

<sup>72</sup> Net costs are the total costs minus the costs Hydro would have incurred in the absence of calling on the additional sources of capacity; see Liberty Report p. 15.

<sup>73</sup> Liberty Report, pp 15–20.

calculations are based and has taken the position that “prudence related disallowances cannot and should not be based on rough estimates”,<sup>74</sup> Vale submits that Liberty has demonstrated that the assumptions it used are more reasonable than those suggested by Hydro.<sup>75</sup> Further, as pointed out by Liberty in its reply, “there are methods available for a more accurate assessment than Liberty’s estimate in this case, but they require better information, which Hydro cannot produce.”<sup>76</sup> [emphasis added] As such, Vale submits that any recovery of 2014 supply costs should be limited to \$7,600,890 (\$9,650,000 - \$2,189,110).

### Conclusions

Vale submits that the Board should adopt the findings of Liberty and remove from rate base and both the 2014 and 2015 test years any costs associated with the imprudent action or inaction by Hydro.

While Hydro has not refuted Liberty’s findings of imprudence, Hydro has shown that some of the adverse financial consequences identified by Liberty should not affect Hydro’s recovery as Liberty (i) double counted an amount, (ii) included costs in its recommended revenue deductions that are not related to the findings of imprudence, or (iii) included actual expenditures in its calculations in situations where the 2014 test year amount Hydro is seeking to recover included an amount that was less than the actuals.<sup>77</sup> To address these issues, Vale submits that the Board should require Hydro to provide a compliance filing detailing the exact amount and basis for each Liberty deduction Hydro claims contains one of these errors.<sup>78</sup> Vale further submits that the parties should have an opportunity to comment on Hydro’s compliance filing before the costs at issue in the Prudency Review are included in any 2014 revenue deficiency recovery order or final rates.

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<sup>74</sup> See Hydro’s Reply Submission, pp. 6-8.

<sup>75</sup> Liberty Reply Report, p 27; GRA Transcript November 12, pp, 63-67 and 99-101.

<sup>76</sup> Liberty Reply Report, p 26.

<sup>77</sup> See Hydro’s Reply Submission , pp. 15, 20-25, 27 and 30 for examples of costs deducted by Liberty that Hydro claims are either unrelated to the activities found to be imprudent or for which recovery has not been sought. At p. 25 of Hydro’s Reply Submission, Hydro offered to file a compliance filing setting out the costs it deems to be improperly deducted by Liberty.

<sup>78</sup> Hydro’s Reply Submission , p. 15.

Costs

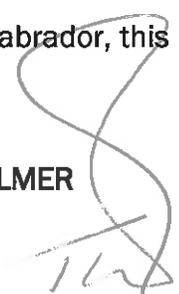
Vale requests that the Board award Vale its costs on the Original GRA and the GRA on the same basis as any award of costs made in favor of the Consumer Advocate and/or the Industrial Customer Group. An award of costs in favor of Vale is justified based on the fact that:

1. Vale's energy consumption is steadily increasing with time and, when Vale's Long Harbour processing facility completes production ramp-up, Vale will be the single largest industrial customer of Hydro. As such, Vale had a significant interest in participating in the within Application; and
2. Vale's interests in the within Application are discreet from the interests of the Industrial Customer Group. In particular, Vale and all members of the Industrial Customer group may not be aligned on manner of recovering past deficiencies through future rate riders.

The within Application was made necessary by the complexity of and delays in the general rate application process as a result of the fact that Hydro elected to allow seven years between GRAs and amended its rate case one month before the hearing on the Original GRA was scheduled to start. Further, the filing of answers to Undertakings and revised RFIs containing material information on GRA issues more than two weeks after the conclusion of the hearing has increased the time and cost associated with preparing these submissions. For these reasons, Vale submits that all or a significant percentage of the costs of the within Application should be borne by Hydro and should not be passed on to Hydro's customers.

DATED at St. John's, in the Province of Newfoundland and Labrador, this 21<sup>st</sup> day of December, 2015.

COX & PALMER

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