

1 **Q. Further to PUB-NP-021, in the opinion of Ernst & Young (“EY”) have the risks of**
 2 **the CSS changed since its June 17, 2018 report? In the response, please explain in**
 3 **detail the manner and the degree to which any risks have changed and their current**
 4 **status. Please also provide EY’s current opinion how the risks could change in the**
 5 **next 5 to 10 years.**

6
 7 A. Note – EY has been asked in this RFI to explain the manner and the degree to which any
 8 risks have changed since the June 17, 2018 report and how risks could change in the next
 9 5 to 10 years. EY has not conducted a refresh of its 2018 report for the purposes of
 10 answering this question; it would not have been feasible within the timelines provided. In
 11 responding to this question, EY has performed additional external scanning, reviewed the
 12 existing public record related to this matter and reviewed information related to
 13 Newfoundland Power’s internal CSS environment.

14
 15 In our June 17, 2018 report, we provided a framework to evaluate five risks associated
 16 with Newfoundland Power’s CSS. These risks included: Vendor Market Share, Vendor
 17 Health, Newfoundland Power’s Support, Reliability and Security, and Business Enabling.
 18 Observed data indicates increasing risk for the majority of the five risk categories over
 19 the past 30 months, albeit to different degrees. Consistent with our 2018 report, our
 20 opinion is that all five risks would likely continue to increase over the next 5 to 10 years.

21
 22 Vendor risk (combines “vendor market share” and “vendor health” risks)

23
 24 Change since 2018 and current status:

25
 26 **Observed data indicates increasing vendor risks since our 2018 report.** In our
 27 report, we commented on the disposition of Customer/1 (C/1) installations in North
 28 America. Our report illustrated the majority of C/1 systems had been replaced or were
 29 being replaced. Specifically, of the 27 utilities listed other than Newfoundland Power,
 30 we indicated that just nine of these appeared to have no CIS evaluation or replacement
 31 implementation underway and would likely still be operating C/1 in 2023, or 5 years
 32 from the date of our report. Based on the data we have presently, of those nine, six have
 33 initiated evaluation/replacement CIS projects or already moved to a new CIS as follows:

- 34 • Dayton Power & Light, part of AES, is implementing SAP
- 35 • Virginia Power (now called Dominion Energy Virginia), part of Dominion
 36 Energy, is implementing SAP
- 37 • Connecticut Natural Gas, part of Avangrid, implemented SAP
- 38 • Brooklyn Union and Niagara Mohawk, part of National Grid, are actively
 39 planning their CIS replacement
- 40 • Another utility (name withheld because it may not be widely known) has
 41 approved a CIS replacement study

42
 43 We were unable to verify plans for the remaining three utilities.

1 This demonstrates an acceleration of C/1 replacements from our original report.
2 Newfoundland Power remains the only Canadian utility of its size to operate this CSS.
3

4 In addition to the continued reduction in the number of companies using a billing system
5 similar to CSS, the number of companies utilizing the foundational technologies
6 comprising CSS has continued to decline.
7

8 **Integrity/Itanium:** CSS runs on HPE's Integrity server and is based on the Intel Itanium
9 processor. Server hardware is critical to overall CSS operation as all software
10 components must be compatible with the hardware. As stated in our 2018 report, the
11 future of Itanium based servers was grim. Intel had announced in May 2017 it was
12 ending development for the Itanium family of processors. Since our 2018 report, Intel
13 has noted on its support site that it has discontinued interactive support for all Intel
14 Itanium processors as of November 25, 2019. Intel Customer Support agents no longer
15 provide technical support via telephone, chat, web ticket, forum, or email inquiries for
16 these products.¹
17

18 In our 2018 report, we noted that Gartner did not expect the longevity of new Itanium
19 server sales to last beyond 2023, which is a clear indicator of obsolescence. We noted
20 that Gartner also recommended all companies using the Itanium based server platform
21 should be developing contingency plans for future migration or replacement.² Since our
22 2018 report, HPE provided notice in June 2020 that they will end general availability of
23 its Integrity i6 server purchases at the end of 2020 or until supplies last.³
24

25 This demonstrates the unpredictability of running obsolete technology as vendor
26 decisions related to product development and support can happen quickly.
27

28 **OpenVMS:** OpenVMS is the operating system and a foundational technology for CSS.
29 As noted in our 2018 report, Gartner cautioned corporations that use the OpenVMS
30 operating system. HPE had stopped selling the operating system and market share had
31 declined to 0.3%, compared to 12.8% to 23.1% for competing systems.⁴ The intellectual
32 property for Open VMS now is owned by a private company called VMS software.
33

34 In our 2018 report, we cited data from International Data Corporation (IDC), a global
35 provider of market intelligence for IT markets. The data showed negative compound
36 annual growth rates of shipments of core CSS technology components (Itanium servers
37 and Open VMS operating systems) in Canada from 2014 to 2017. Since then, shipments
38 of OpenVMS have decreased an additional 61% to just 7 shipments in 2020, representing
39 0.01% of total market operating system shipments to Canada that year. Shipments of
40 EPIC/Itanium servers have decreased by an additional 58% since 2017 to just 51

¹ Source: <https://www.intel.com/content/www/us/en/support/products/451/processors/intel-itanium-processor.html>

² Source: EY's 2018 report.

³ Source: HPE correspondence to Newfoundland Power - June 2020.

⁴ Source: EY's 2018 report.

1 shipments in 2020, representing 0.06% of total market server shipments to Canada that
 2 year.⁵ These figures demonstrate a continued, significant decline in the use of these
 3 technologies that are foundational to Newfoundland Power's CSS.

4
 5 **Oracle on OpenVMS:** In our 2018 report, we noted that Newfoundland Power was
 6 currently on version 10.2 and was planning to upgrade to version 11.2. We also noted that
 7 Oracle had not committed to a release date for 12c on OpenVMS. Since that time, Oracle
 8 released information in 2020 that there would be no 12c release on OpenVMS and that
 9 there would be a terminal release 11.2.0.4. Terminal release means that the version
 10 specified is the last point release of that product. Support for the product is noted as
 11 ending in 2022. In our 2018 report, we noted a low rating for vendor investment for this
 12 product. With this terminal release notice, Oracle has indicated the end of its investment
 13 in the product.

14
 15 Opinion on how the risks could change in next 5 to 10 years:

16
 17 **It is expected for vendor risks to further increase during this period.** The trend of
 18 declining number of utilities operating CSS and corresponding vendor market share is
 19 expected to continue. No coordinated enhancements or investments into CSS are being
 20 made by the remaining users; any enhancements required to modify CSS to accommodate
 21 future requirements will be borne solely by Newfoundland Power. Likewise, the
 22 foundational technologies comprising CSS have reached or are nearing obsolescence, and
 23 the vendors that once sold them have shifted their focus to newer technologies. It would
 24 be a high-risk strategy for any utility to continue procuring aftermarket replacement
 25 Integrity servers with no warranty or support from the original manufacture, particularly
 26 for a critical system such as CSS.

27
 28 Newfoundland Power's Support Capacity Risk

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 30 Change since 2018 and current status:

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 32 **Observed data indicates increasing Newfoundland Power's support risk since our**
 33 **2018 report.** This is based on Newfoundland Power's projection of a decrease in its
 34 CSS support capacity from 12 FTE (2018) to 10 FTE (2021).⁶ This projection is based
 35 on natural attrition and doesn't account for unexpected departures. The ability to
 36 replenish this capacity will continue to be difficult. As stated in our 2018 report,
 37 education curriculum related to CSS underlying technologies is scarce or non-existent. It
 38 will be difficult for Newfoundland Power to identify, attract and retain talent related to
 39 technologies that are nearing or have reached obsolescence.

40
 41 Opinion on how the risks could change in next 5 to 10 years:

42
 43 **It is expected for Newfoundland Power's support risk to further increase during this**
 44 **period.** As noted in our 2018 report, Newfoundland Power's current CSS support

⁵ Source: IDC – Worldwide Quarterly Enterprise Infrastructure Tracker.

⁶ Source: PUB-NP-014.

1 capacity was “just” sufficient for the CSS underlying technologies. Based on our
2 analysis, we projected that 60% of current staff proficient from both a technology and
3 functional perspective may retire in 10 years. In addition, Newfoundland Power noted in
4 PUB-NP-014 that CSS support capacity is expected to decline from 12 employees in
5 2018 to 6 employees in 2028. Throughout a 5 to 10-year period, it can only be expected
6 that it will become increasingly difficult for Newfoundland Power to identify, attract and
7 retain talent related to technologies that are nearing or have reached obsolescence. In
8 addition, it would also be a challenge for Newfoundland Power to expand beyond its
9 current core competencies and build its own education/training capability and curriculum
10 for these obsolete technologies.

11
12 Possessing sufficient CSS support capacity serves a purpose beyond helping CSS operate
13 as expected. The ability of these individuals to actively support the migration from CSS
14 to a new system will be a key success factor for any future CIS replacement program.
15 The system integrator that Newfoundland Power works with to replace CSS will bring
16 the requisite knowledge of leading practices and the new CIS, but they will heavily rely
17 upon Newfoundland Power’s CSS support personnel for information about the data
18 consumed and produced by CSS as well as the integrations to and from CSS to other
19 applications. In migrating from legacy to modern CIS, data conversion is considered one
20 of the most complex and critical workstreams. Insufficient CSS support personnel
21 participation in data conversion due to lack of availability would inject additional
22 implementation risk into the project.

23
24 In our experience, given its size, Newfoundland Power can expect to assign four to six of
25 its 10 CSS support personnel to a CSS replacement project. If Newfoundland Power’s
26 prediction of having only 6 CSS support employees by 2028 materializes, undertaking
27 the project at that time would be very difficult and risky. Newfoundland Power would
28 face the unenviable decision of either supporting the CIS project adequately while
29 providing insufficient capacity to support CSS day-to-day or provide inadequate support
30 to the CIS project which would increase its risk and cost.

31 Reliability and security risk

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34 Change since 2018 and current status:

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36 **We observed no new data to suggest the low-moderate security risk has changed,**
37 **however observed data indicates increasing reliability risk since our 2018 report.**

38 This increase in the reliability risk is due to the announcements since 2018 from HPE and
39 Intel noted above that Integrity servers will no longer be manufactured and the Itanium
40 processors that run on those servers are no longer supported. Hardware failures are not
41 unusual, in fact Newfoundland Power had two Itanium memory modules fail in 2020.⁷
42 Utility IT departments have plans to replicate and protect customer data and provide
43 disaster recovery in the event of unplanned technology failures. However, these plans
44 would not be viable if Newfoundland Power is unable to procure replacement servers and
45 processors.

⁷ Source: PUB-NP-014, page 7, footnote 24.

1 Opinion on how the risks could change in next 5 to 10 years:

2
3 **It is expected for reliability and security risk to further increase during this period.**

4
5 Reliability: As routine failures continue to occur, with increased vendor risks as noted
6 above there will be increased challenges in procuring replacement servers/parts which
7 will negatively impact Newfoundland Power's ability to maintain system reliability. In
8 its correspondence to Newfoundland Power, HPE indicated that it will stop
9 manufacturing Integrity servers in 2020 and that its supply of Integrity servers is not
10 expected to last beyond the year. While there may be pockets of usable Integrity server
11 inventory available for purchase from other companies, sourcing from electronic
12 marketplaces like eBay for parts is not a viable plan to support reliability. This will be
13 compounded with the projected decreased CSS support capacity to deal with CSS issues
14 and failures.

15
16 Security: With a shrinking market share of the foundational CSS technologies and
17 without continued investment from vendors, the ability for Newfoundland Power to
18 update security of systems may be hindered. As technologies become obsolete, the
19 companies which once actively sold them offer fewer or no patches. A patch is typically
20 a small amount of code that fixes a known functional or security issue. With few or no
21 patches issued by the vendors of the foundational CSS technologies, Newfoundland
22 Power will be largely left on its own to identify and resolve and potential security
23 vulnerabilities.

24
25 Business enabling risk

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27 Change since 2018 and current status:

28
29 **Observed data indicates business enabling risk has remained at moderate-high since**
30 **our 2018 report.**

31
32 Opinion on how the risks could change in next 5 to 10 years:

33
34 **It is expected for business enabling risk to further increase during this period.**

35 Customer expectations are highly likely to continue to evolve and increase during this
36 time. Newfoundland Power may not be able to meet these expectations as CSS is not
37 positioned to support Newfoundland Power in a digital environment. Market and
38 regulatory changes (e.g., vehicle electrification, performance-based regulation) could also
39 be required during this period. Newfoundland Power reports that, on average, CSS has
40 required significant enhancements every 2 ½ years⁸ which implies another two to four
41 significant enhancements over the next 5 to 10 years. It is uncertain whether
42 Newfoundland Power's CSS would be able to accommodate such enhancements, as it
43 would be dependent on the nature and complexity of the functionality required.
44 Newfoundland Power has cited several limitations of CSS. For example, CSS could not
45 be enhanced to deliver the One-Time Customer Bill Credit in July 2020, nor can it

⁸ Source: PUB-NP-014.

1 support the billing of Net Metering customers and certain General Service customers.
2 These limitations noted have been resolved with manual processes.⁹

3
4 Many utilities seek to use their modern CIS to offer more real-time and self-service
5 options to customers. CSS offers basic self-service capabilities through MyAccount such
6 as the ability to check one's balance and sign-up for certain programs. More advanced
7 self-service capabilities such as scheduling move-ins/move-outs or making a payment
8 and seeing it immediately apply to one's balance require real-time information, which
9 CSS does not support. Newfoundland Power customers noted their preference for real-
10 time information on MyAccount in a series of focus groups conducted in early 2020 by
11 MQO.¹⁰ We believe the gap between customer expectations and the capabilities of CSS
12 will become more pronounced over time.

13
14 There is a notable linkage between business enabling risk and Newfoundland Power's
15 support risk. As support capacity declines, not only does the risk of supporting the as-is
16 CSS increase, but the ability to successfully enhance CSS is simultaneously diminished
17 due to the loss of CSS know-how. In those cases where a business enhancement to the
18 system can be accommodated, the end-result is generally a more customized, complex
19 system. Supporting the customizations requires additional support – even as those
20 knowledgeable individuals are retiring.

⁹ Source: PUB-NP-014.

¹⁰ Source: Customer Service Continuity Plan, June 2020, Attachment B.