

1 Q. **Reference: Schedule 1, Page 10, Section 4.3.2.**

2 Annual assessment reports, completed by Kleinschmidt over the period from 2019 to 2024
3 (excluding 2020), include information on the remaining service life of Penstock 3. In the 2024
4 assessment report, Kleinschmidt’s recommendation is that “Penstock 3 17-ft diameter section
5 should be replaced within 7 years.”

6 a) Explain why Hydro considers the Penstock 3 project to be required at this time given
7 Kleinschmidt’s recommendation for replacement within 7 years. In the response, please
8 include any technical analysis that supports proceeding at this time.

9 b) What measures, such as continued inspections and weld refurbishments, would have to be
10 implemented to delay the refurbishment of Penstock 3 for 1, 2, or 3 years?
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13 A. a) The 2024 assessment report recommended replacement timelines for Penstocks 2 and 3 at
14 the Bay d’Espoir Hydroelectric Generating Facility (“Bay d’Espoir”) of five years and seven
15 years, respectively. In documentation provided to Newfoundland and Labrador Hydro
16 (“Hydro”) dated July 2025, Kleinschmidt Associates (“Kleinschmidt”) advised Hydro of an
17 error in the 2024 assessment report whereby the recommended replacement timelines for
18 Penstocks 2 and 3 were inadvertently swapped. As a result, the recommended replacement
19 timeline for Penstock 3 is within five years, not seven years. The comment documentation
20 was inadvertently not included with Hydro’s application; it is included as PUB-NLH-002,
21 Attachment 1.

22 The first year Hydro found indications in previously repaired welds was 2023. Hydro has
23 continued to find indications in previously repaired welds in each subsequent annual
24 inspection. Kleinschmidt accelerated the timeline of penstock refurbishment from eight
25 years in 2023 to five years in 2024 in part as a result of the increased volume of indications
26 in previously repaired welds. Hydro’s decision to proceed with the Penstock 3 Weld
27 Refurbishment and Section Replacement (“Penstock 3 Project”) at this time is a risk-based

1 decision intended to manage the likelihood and consequence of continued penstock
2 deterioration and weld failure. The risk drivers considered by Hydro include: the history of
3 recurring weld indications and the limited durability of weld repairs; uncertainty in the
4 future rate of weld deterioration; and the potential for weld failure leading to forced
5 outages. The condition of Penstock 3 poses a risk to system reliability.

6 While Kleinschmidt recommended refurbishment within five years, Hydro considers it
7 prudent to address the identified asset risk as soon as practical. Technical assessments and
8 operational experience indicate that the asset is at or nearing its end-of-life. This conclusion
9 is supported by the repeated findings of weld indications, including failures occurring at
10 locations that had previously undergone repair. The recurrence of weld defects following
11 repair activities increases uncertainty regarding the remaining service life of the penstock
12 and limits confidence in the long-term effectiveness of continued localized repairs as a
13 sustainable mitigation strategy.

14 Hydro also considered the uncertainty associated with predicting future deterioration rates
15 and the operational consequences associated with a forced outage of Penstock 3. Given the
16 age and condition of the asset, Hydro determined that deferring execution of the project
17 would increase the risk exposure associated with both reliability and operational flexibility.
18 Advancing the project at this time reduces the likelihood of unplanned outages and provides
19 greater certainty with respect to future generation planning.

20 In addition to the technical condition of the asset itself, Hydro must consider the broader
21 context of the overall long-term asset plan for Bay d'Espoir and the Island Interconnected
22 System. Multiple major generation projects are proposed for the coming years, including
23 Penstock 2 Weld Refurbishment and Section Replacement, Unit 7 Life Extension work, the
24 addition of Unit 8, and other significant generation outages across the system. Delaying
25 commencement of the Penstock 3 Project would increase scheduling and outage
26 coordination complexity and could reduce Hydro's flexibility to manage cumulative system
27 risk and generation availability in future years.

1 Hydro must also coordinate site access, accommodations, outage availability, procurement
2 activities, and the availability of internal and external EPCM¹ resources across multiple
3 concurrent capital projects. Timely execution of the Penstock 3 Project supports more
4 effective sequencing of this work and reduces the risk of overlapping major outages or
5 resource constraints during future winter peaks.

6 Please refer to Hydro's response to PUB-NLH-005 of this proceeding for further discussion
7 on the sequencing and coordination of major works.

8 **b)** Until the Penstock 3 Project is complete, annual Level 2 Condition Assessments of the asset
9 will continue, followed by weld repairs of any indications. Operating restrictions, including
10 minimum unit loadings on Units 5 and 6, will also be maintained.² Minimum unit loadings
11 introduce operational constraints, such as limiting the ability to dispatch unit output to meet
12 system demands and manage system hydrology. While ongoing inspection and repair
13 programs can manage risk in the short term, they do not eliminate the underlying condition.
14 Proceeding with refurbishment now is required to ensure ongoing safe, reliable service from
15 Bay d'Espoir and to enable Hydro to continue meeting established planning criteria and
16 satisfying current customer requirements.

¹ Engineering, Procurement, and Construction Management ("EPCM").

² Under this operating regime, Units 5 and 6 are limited to a minimum unit loading of 50 MW, up to the unit maximum once dispatched and are not cycled or shut down as part of normal system operations.



MAJOR PROJECTS DOCUMENT REVIEW COMMENT SHEET

Owner: Hydro **Contractor:** Kleinschmidt

Project Name: Penstocks 1-3 Inspection Project **Project Location:** Bay D'Espoir Hydroelectric Development

Package Title: _____ **Package No.:** _____

Document Title: Penstock 3 Inspection and Evaluation

Hydro Doc. No.: N/A **Rev. No.:** N/A **Contractor Doc. No.:** 2670043 **Rev. No.:** 01

Date to Hydro: December 2024 **Date to Contractor:** 5-May-2025

Hydro Lead **Contractor Lead**

Reviewer Name: Chelsey Pike **Reviewer Name:** _____

Item	Section/ Paragraph/ Page	Comment	Comment By	Contractor Response	Hydro Response	Contractor Response	Status
1	Section 6.0, 6.1	Please confirm the 17 ft diameter section of Penstock 3 should be replaced within 7 years. This timing differs from the recommendation for Penstock 2. See Penstock 2 Inspection Report 2670043	CP	Upon review, the years appear to be switched between the penstocks. Based on the higher quantity of indications identified in Penstock 3 in recent years, it should be replaced within 5 years, and Penstock 2 within 7 years.			Open
	Section 5.0	Please confirm the remainder of Penstock 3 should have extensive weld refurbishment from inside and outside within the next 7 years. This timing differs from the recommendation for Penstock 2. See Penstock 2 Inspection Report 2670043	CP	Upon review, the years appear to be switched between the penstocks. Based on the higher quantity of indications identified in Penstock 3 in recent years, it should be replaced within 5 years, and Penstock 2 within 7 years.			Open

Hydro Lead **Contractor**

Reviewer Signature: *CPike* **Signature:** **Chris Vella**

Date: 2025.05.05 15:34:00 -02:30' **Date:** _____

