Q. **Reference: Midgard Consulting March 28, 2023 Report - Southern Labrador Communities – Integrated Resource Plan**

The St. Lewis (2006), Port Hope Simpson (1995), and Mary's Harbour (1994) diesel generating stations were three of the last seven most recently constructed diesel generation stations in Hydro's system of 23 such stations.

a) Is it possible for Hydro to extend the operational lives of the diesel generating stations to 50 years rather than the approximate 40 years used in Hydro's current analysis? If yes, please detail the necessary work and cost to do so. If not, please explain.

b) Please provide the net present cost of all alternatives assuming that diesel generating station replacements were delayed until the diesel generating stations were in operation for 50 years.

A. *This response has been provided by Midgard Consulting Inc. ("Midgard").*

a) It is possible to extend the operational lives of the existing generating stations, but this may be more costly than retiring them as currently planned. Newfoundland and Labrador Hydro's Scenario "2" and "7" (Midgard scenarios "B" and "D") to retain the Mary's Harbour Generating Station until the planned retirement date of 2030, but include an additional cost of $811,000 is needed to extend the life of that station as described in Midgard's "Southern Labrador Communities - Integrated Resource Plan" ("Midgard IRP"),[1] filed with the Board of Commissioners of Public Utilties on March 31, 2023.[2] The costs for service life extension will vary, but in general, the dominant cost for thermal (diesel) power plants is fuel cost. The savings in fuel provided by servicing the load from a centralized facility using larger, more efficient generators more than offsets the additional capital costs. This is demonstrated by the lowest cost scenario being Scenario C, which involves immediate construction of a

[1] "Southern Labrador Communities - Integrated Resource Plan," Midgard Consulting Inc., March 28, 2023.
[2] "Long-Term Supply for Southern Labrador – Phase 1 – Midgard Consulting Inc. Report," Newfoundland and Labrador Hydro, March 31, 2023, att. 1.

regional plant to serve all four systems via a new 25kV interconnection, with associated 25 kV voltage upgrades in all communities.

b) Midgard has re-modelled alternatives A, B, D, E and F (including subvariants) to allow for a 50-year generating station life.[3] In this modelling, the original genset replacement schedule has been retained because Midgard believes that a planned ten-year life extension of individual gensets is unreasonable. Changes included within the model has a new assumed depreciable life of 50 years for new stations, which is captured in the terminal value capital benefit assumed for all alternatives in 2049 and delayed capital deployment for respective new station construction and old station decommissioning. Additional operating costs and upgrade and life extension costs associated with an assumed ten-year extension to existing generating stations has not been included because Midgard has not undertaken the required plant condition assessment or associated engineering work needed to forecast those costs. For the purpose of this response, Midgard considered this a suitable simplifying assumption because any uncertain increases in operating and maintenance costs associated with increased maintenance of an aging plant would partially offset the benefit ascribed to the capital deferral.

A revised Table 35 from the Midgard IRP is presented to show the results of this analysis.

[3] Alternatives C, G and H were not altered because they remain unchanged by the requested assumption.

Table 35 - Restated

Rank	Option	NPV Costs	Cost Increment
1	C (N-1) + Renewables	$172,500	-
2	C + Renewables	$176,600	4,100
3	F(i) (N-1) + Renewables	$178,200	5,700
4	F(i) + Renewables	$183,900	11,400
5	C (N-1) + Natural Gas + Renewables	$184,800	12,300
6	C (N-1)	$186,100	13,600
7	A + Renewables	$187,600	15,100
8	C + Natural Gas + Renewables	$189,500	17,000
9	F(ii) (N-1) + Renewables	$190,200	17,700
10	C	$190,200	17,700
11	F(i) (N-1)	$191,200	18,700
12	E + Renewables	$192,800	20,300
13	F(ii) + Renewables	$194,100	21,600
14	B + Renewables	$195,400	22,900
15	D + Renewables	$196,000	23,500
16	A	$196,900	24,400
17	F(i)	$196,900	24,400
18	F(ii) (N-1)	$203,900	31,400
19	B	$204,600	32,100
20	C (N-1) + Natural Gas	$205,400	32,900
21	F(iii) + Renewables	$206,600	34,100
22	F(ii)	$207,800	35,300
23	E	$209,700	37,200
24	C + Natural Gas	$210,100	37,600
25	D	$212,800	40,300
26	F(iii)	$221,100	48,600
27	G	$225,500	53,000
28	H	$304,200	131,700