

1 Q. Further to the response to PUB-NLH-008, state the date(s) the criteria used for
2 generation source additions was last reviewed by Hydro. In the response state
3 whether Hydro is of the opinion it should be reviewed in light of Hydro's aging
4 infrastructure and when is the appropriate time to review this criteria.

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7 A. Hydro's generation source additions criteria have been in use for over 35 years and
8 in that period they have been reviewed on a number of different occasions and
9 found to provide a good balance of reliability versus cost.

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11 Before 1977, there were no approved long-term reliability criteria for generation
12 planning in Hydro. The basis of the current criteria is a report, *Recommended Loss*
13 *of Load Probability (LOLP) Index for Establishing Generation Reserve Additions*,
14 System Planning Department, May 16, 1977. In that report, a LOLP of 0.2 days per
15 year, or 1 day in 5 years was established. In 1997, when Hydro replaced the SYPCO
16 generation planning software with ProScreen II (now renamed Strategist)
17 generation planning software, it was necessary to switch to a Loss of Load Hours
18 (LOLH) criterion. Benchmarking established that a LOLH of 2.8 hours per year was
19 equivalent to a LOLP of 0.2 days per year, for Hydro's system. From that point
20 onward, Hydro established the capacity criteria that the Island Interconnected
21 System should have sufficient generating capacity to satisfy an LOLH expectation
22 target of not more than 2.8 hours per year.

23

24 In 1991, at the direction of the Board, George C. Baker, a consultant working for
25 Hiltz and Seamone Company Limited carried out a study and produced a report -
26 *Report on the Technical Performance of Newfoundland & Labrador Hydro* - October
27 2, 1991. On page 9 of the report, in Section 7 *System Planning*, it states:

1 *Hydro uses two criteria for generation planning in its interconnected system.*

2 *(a) Sufficient production capacity to meet all needs under firm water conditions*
3 *(lowest recorded flows), and*

4 *(b) A loss of load expectancy of one day in five years.*

5
6 *The first criterion is usual for utilities with significant dependence on hydraulic*
7 *generation. The second differs from the one-day-in-ten-years LOLE¹ adopted by*
8 *many utilities.*

9
10 *The main reason for permitting a higher LOLE is economic. Hydro, unlike almost*
11 *every other major utility, is an isolated system. Other utilities can, and do, rely on*
12 *capacity support from interconnected utilities in meeting the one-day-in-ten-years*
13 *criterion. Hydro cannot do this, and would have to maintain a much higher*
14 *generation reserve. Hydro believes the costs of doing so would not be justified by*
15 *the difference in reliability. The Consultant agrees.*

16
17 *In 1999, at the direction of the Board, Quetta Inc. and Associates carried out a study*
18 *and produced a report *Technical Review of Newfoundland and Labrador Hydro Final**
19 *Report March 17, 1999. On page 23 of the report, in Section 2.1.3.2 Capacity, it*
20 *states:*

21
22 *The Island Interconnected System should have sufficient generating capacity to*
23 *satisfy a Loss of Load Expectation (LOLE) target of not more than 2.8 hours per year.*
24 *This is equivalent to 0.2 days/year or 1 day in five years. It results in a capacity*
25 *reserve requirement of 18%.*

¹ Loss of Load Expectation. LOLE is another way of stating LOLP and the two are equivalent.

1 *The LOLE capacity criterion is somewhat less stringent than that employed by large*
2 *interconnected systems in the rest of North America (one day in 10 years or 0.1*
3 *days/year). Considering the non-interconnected status of the Island's electric utility*
4 *system, (reserve sharing is not an option) the cost of providing higher reliability level*
5 *is probably in excess of the benefits to be derived.*

6
7 *Quetta is of the opinion that the capacity and energy criteria are reasonable in the*
8 *circumstance.*

9
10 *Most recently, the criteria were reviewed in the Report on Two Generation*
11 *Expansion Alternatives for the Island Interconnected Electrical System – Volume 2:*
12 *Studies January 2012. This report was prepared for the Board by Manitoba Hydro*
13 *International. In the report, Section 3 – Reliability Studies runs from page 57 to*
14 *page 71. Section 3.11 – Conclusions and Findings, page 70, states the following:*

15
16 *Available documentation for reliability assessment performed by Nalcor has been*
17 *reviewed by MHI. The adequacy criteria of 2.8 hours/year of loss of load expectation*
18 *for resource planning, which considers both generation resource availability and*
19 *economics, appears reasonable when compared to practices of other operating*
20 *utilities.*

21
22 *As part of its internal review of recent events, Hydro has engaged an outside*
23 *consultant (Ventyx) to review its generation planning practices. One of the areas to*
24 *be reviewed is the criteria used for generation source additions. As well, in light of*
25 *Hydro's aging infrastructure, it is also appropriate to review the inputs to the*
26 *generation expansion model, such as the current and expected forced outage rates*
27 *of Hydro's generating units. These will also be reviewed.*