

1 Q. Further to the response to PUB-NLH-223, which states that with all maintenance
2 complete the system can operate with all synchronous condensers in service to
3 provide maximum security, please provide details of the anticipated operation of
4 the synchronous condensers at Holyrood and Soldiers Pond during the peak season.
5 Please state the minimum requirements for operation and if the remaining
6 synchronous condensers will be available offline or synchronized to the system.

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9 A. The total synchronous condenser package associated with the Labrador – Island
10 HVdc Link (LIL) includes three 175 MVAR high inertia synchronous condensers at
11 Soldiers Pond, Holyrood Unit 3 operating as a synchronous condenser and another
12 nominal 120 MVAR synchronous condenser. System studies to date with the LIL in
13 operation have determined that prior to a fault, there must be a minimum of two
14 high inertia synchronous condensers on line at Soldiers Pond and the two other
15 synchronous condensers on line to ensure stable system response following a
16 230 kV fault and loss of one high inertia synchronous condenser. Two high inertia
17 synchronous condensers are also required to be on line to maintain acceptable
18 system frequency and recovery during a temporary bipole outage of the LIL,
19 particularly when the LIL is operating at high loads.

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21 During low load periods on the Island Interconnected System (i.e., spring, summer
22 and fall) annual synchronous condenser maintenance will be performed
23 sequentially such that all synchronous condensers are available for operation prior
24 to the winter peak load season. For example, assuming a two-week annual
25 maintenance period per synchronous condenser, the maintenance schedule would
26 begin in early May with Holyrood Unit 3, followed by the other nominal 120 MVAR
27 unit. June and July would be used for annual maintenance of the Soldiers Pond

1 synchronous condensers. This leaves the months of August and September for
2 synchronous condenser major overhauls which are anticipated to take
3 approximately six weeks every five to six years. In the longer term it is expected
4 that the annual maintenance schedule will include four annual maintenance periods
5 for four synchronous condensers and one major overhaul period for one
6 synchronous condenser. The major overhaul is expected to rotate through the
7 machines sequentially on a five or six year basis depending upon manufacturers
8 recommendations. Holyrood Unit 3 generator and related auxiliaries currently
9 receives a major overhaul every six years.

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11 With all synchronous condenser maintenance completed during the off peak load
12 periods when the LIL load will be low and there are sufficient hydro-electric
13 resources on the Island Interconnected System to supply Island load, all
14 synchronous condensers will be available for the peak load period. It is anticipated
15 that all synchronous condensers will be in operation throughout the daily peaks
16 during the winter peak load season. At night when the LIL, Island Interconnected
17 System and Maritime Link loads are reduced, it is anticipated that one of the five
18 synchronous condensers will be removed from service to reduce system losses.

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20 Detailed operational studies necessary to develop complete operating guidelines
21 for the Labrador-Island HVdc Link, including the number of on line synchronous
22 condensers for varying LIL output, will be completed in the 2015-2016 timeframe
23 following completion of the HVdc converter design and final PSS®E and PSCAD™
24 model development by the vendor.