

1 Q. In the San Onofre technical paper referred to in PR-PUB-NLH-178 it is noted that the
2 authors cited the surprisingly large number of lube oil system failures in large
3 turbine-generators. For example, they report that five such failures were reported
4 in fossil-fueled stations in the first half of 2001 alone. As this would lead plant
5 owners to think their exposure to lube oil failure was greater than previously
6 thought, please advise if Hydro took any action when it received this information.
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9 A. Prior to the issue with the lube oil system on Unit 1 in 2013, Hydro continued to
10 follow the OEM recommended test procedure and recognized the expertise that
11 supported its use. Hydro had no reason to suspect there was an issue with the test
12 procedure or the equipment itself. Hydro partners with OEMs like GE in support of
13 maintenance program execution, also leveraging knowledge and experience they
14 share from the broader fleets they service and associated lessons learned.
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16 The magazine article describing a lube oil failure at the San Onofre nuclear station
17 was only discovered by Hydro during the TapRoot investigation after the failure in
18 question. It was subsequently referenced to support Hydro's claim that there was a
19 design defect in the system test procedure on the DC lube oil pump as specified by
20 the OEM and that Hydro's experience was not unlike that of another facility. At the
21 time of discovering this information, Hydro completed a TapRoot investigation for
22 confirmation of cause. Subsequently, Hydro modified the presentation of pump
23 performance data. By trending the pressure data and making it visible during pump
24 testing, an increase in pressure can be observed when the DC lube oil pump is
25 started, indicating proper operation. Conversely, if no pressure increase is
26 observed, then pump maintenance is required.

1 Hydro's approach to managing its assets, in this case the Holyrood assets, includes
2 proactively looking for information and opportunities to improve our maintenance
3 and operational activities. Given the amount of available information, across many
4 varied types of assets and operations, from many different sources, Hydro
5 leverages its partnerships with OEMs to help focus our efforts in a cost effective
6 and efficient manner. The OEM knowledge of failures and improvements on their
7 broader in-service fleets of similar assets, enables them to filter and make focused
8 recommendations to Hydro. The same is true in the way Hydro leverages its
9 relationship with its insurer, FM Global (a significant insurer of electrical generation
10 facilities with extensive technical expertise available to them), and their access to
11 broader issues, failures and improvements information.

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13 Hydro uses this information, executing activities to continuously manage Hydro's
14 risk profile and using external oversight from FM Global inspections, along with its
15 own internal programs, to ensure appropriate actions are taken. Bulletins and
16 recommendations received from these sources are reviewed and compared against
17 Hydro's current practices, with opportunities to improve maintenance, inspections,
18 etc. being incorporated into our programs where appropriate. Primary
19 accountability for this lies with the Long Term Asset Planning function, with
20 oversight by the defined asset owner. Furthermore, Hydro employs focused
21 condition assessments such as the EPRI level I and II condition assessments
22 performed at Holyrood by AMEC in 2011 and 2012. Also in 2011, Hydro completed
23 implementation of a comprehensive Asset Maintenance Review project that
24 compared Hydro's maintenance practices externally across North America. Tactics
25 were compared with differences being investigated and identified improvements
26 adopted where value was demonstrated. The evaluations included technical
27 personnel and front line maintainers and operators and considered Hydro's specific
28 operational and environmental context. Hydro uses its partnerships and contacts

- 1 to access and filter a large pool of equipment and operational data, turning it into
- 2 valuable information, which Hydro believes is the prudent approach.