

1 **Q.** In the report “Rose Blanche Hydro Plant Turbine No. 1 Refurbishment”, in
2 Schedule C, Section 1.2, page 1, it is written “On December 14, 2016, maintenance
3 personnel were dispatched to the Plant to reset the unit following a trip due to high
4 bearing temperature. The high bearing temperature resulted from the oil pump
5 operating in DC mode as opposed to the normal AC mode.” Footnote 3 to this
6 statement notes “The DC mode is a backup mode in the event of failure of the AC
7 power supply. It preserves oil flow to the bearings to prevent damage, and the lower
8 than normal oil flow triggers a unit shutdown when the bearing temperature rises as a
9 result.”

10
11 **Is it known what caused the failure of the AC system that resulted in the unit**
12 **running on the DC pump? Why doesn’t the unit trip off line when the ac pump fails**
13 **in order to prevent overheating, instead of waiting for the system to overheat before**
14 **tripping?**

15
16 A. The power supply to the AC pump failed as a result of a tripped breaker. The cause of
17 the tripped breaker is not known. Following normal checks, personnel closed the breaker
18 and the AC pump operated normally.

19
20 An automatic trip of the unit on the loss of the AC pump is not necessary to prevent
21 bearing damage because the DC pump provides sufficient lubrication to protect the
22 bearings when the AC pump is not operating. However, the DC pump is not designed to
23 provide sufficient bearing lubrication for continuous operation of the unit. The unit is
24 designed to trip off before the bearing temperature approaches unacceptable levels. This
25 protection system operated as intended on December 14, 2016.¹

26
27 The purpose of the DC pump is to provide a backup for the AC pump whenever AC
28 power is not available. This occurs whenever the power supply from the grid is lost
29 while the Rose Blanche hydroelectric plant (the “Plant”) is in operation, and whenever
30 the Plant is started during an outage condition (a “blackstart”).

31
32 If a power outage occurs while the Plant is operating, the DC pump provides sufficient
33 lubrication to protect the bearings while the Plant is being shut down.²

34
35 During a blackstart of the Plant, power is not available from the grid to supply the AC
36 pump. The lubrication provided by the DC pump is sufficient to protect the bearings
37 until the unit is online and providing power to the AC pump.

38
39 To avoid extended operation of the DC pump in future, Newfoundland Power intends to
40 modify the control system to provide an alarm to the System Control Centre whenever
41 lubricating oil flow is transferred to the DC pump.

¹ Although it is believed the failure of the turbine runner occurred at the time the unit tripped off, the failure was not related to the bearing temperature.

² With the loss of load occasioned by a power outage, a shutdown is necessary to protect the generator.