Q. **Re: AMEC Report**

Provide a list of the AMEC recommendations that relate to the continued operation of the Holyrood Plant as a generator and not a synchronous condenser.

A. The following highlights the recommendation items from the AMEC Report Section 15 that relate to generation only. Where changes have been made to section references to be more specific, these portions are highlighted in bold. As is evident, much of the recommended items are related to generation only – primarily as it relates to the boiler, the steam and feedwater high pressure parts for safety reasons, and to the normal steam turbine overhaul requirements in the period up to 2021.

The following are recommended to keep the units at the HTGS running safely and reliably in generation mode through 2021:

<u>Overall and Station Wide</u>

1. Implement the recommended Level 1 and 2 condition assessment tasks identified in Chapters 8 to 11 **(For generation only - in Sections 8.2, 9.2, 10.2, 11.2)** and summarized in Chapter 12, including augmented steam turbine and generator overhauls at their next normal overhaul date to the extent economically practical.

2. Retain the nine year major inspection/overhaul interval and minor three year valve outage timing for the steam turbines, subject to any unexpected changes in conditions found at their inspection/overhauls and, in particular, at their next inspection/overhaul. Undertake the steam turbine pre-outage actions identified in Chapters 8 to 10 **(Sections 8.2.9, 9.2.9, 10.2.9).**

3. In 2011 and 2012, carry out a detailed condition assessment of high pressure and temperature feedwater and steam lines on all units as a very high priority safety and reliability due diligence task. Plan and implement an extensive high pressure and temperature pipe hanger inspection program as part of the plant's PM, safety, and reliability due diligence programs.

4. Carry out Level 2 inspections and testing in 2012, 2013, and 2014 for Units 1, 2, and 3 respectively on boiler components identified in Chapters 8 to 10 **(Sections 8.2.1, 9.2.1, 10.2.1).**

5. Carry out Level 2 inspections and testing in 2012, 2013, and 2014 for Units 1, 2, and 3 respectively on high pressure heater components identified in Chapters 8 to 10 **(Sections 8.2.2, 9.2.2, 10.2.2).**

6. Carry out Level 2 inspections and testing in 2012, 2013, and 2014 for Units 1, 2, and 3 respectively on deaerator components identified in Chapters 8 to 10 **(Sections 8.2.3, 9.2.3, 10.2.3).**

7. Carry out Level 2 inspections and testing on low pressure heaters in 2011 for Units 1, 2, and 3 **(Sections 8.2.4, 9.2.4, 10.2.4).**

8. Maintain existing programs for major equipment, pumps, and motor inspection scheduling and overall PM process.

9. Procure one spare 4 kV motor for each of the boiler feedwater pumps, the forced draft fans, condensate extraction pumps, and the cooling water pumps – primarily designed for Units 1 and 2, but with plans on how to use them with Unit 3 as necessary.

10. Inspect all condensate polishers in 2011. Replace Units 1 and 2 remaining enunciator panels (Unit 3 enunciator panel was replaced in 2007). Assess the cost-benefit of replacing polisher control panels on all units considered obsolete in light of generation end of service timeline.

Common Facilities

1. Replace the electric heat tracing for the heavy fuel oil transfer pipe line from the off loading dock to the main storage tanks in 2010 or early 2011.

2. Internally inspect the heavy oil day tank in 2011 for regulatory purposes.

3. Perform underwater inspections on circulating water intake and discharge structures and piping in 2011. Perform walk down or remote integrity inspections of the large concrete pipes from the pump houses to the condensers and to the discharge siphon pits and inspect the stop log structure in 2011.

4. Develop a program to assess the condition of underground services (raw water, fire water, grounding, waste water piping, and lighting) as the current condition is not clear.

5. Undertake Level 2 integrity inspections of single contingency failure candidates including the dam at Quarry Brook, the raw water supply line from the dam site to the Stage 1 pumphouse, and the original water treatment plant clarifier, sand filters, and clearwell.

6. Improve, refurbish or replace CEM systems, waste water basin discharge treatment systems, oil filled exciter transformers (if and when new PCB regulations are implemented), and the oily water separator and pipes.

7. Replace the Stage 2 diesel generator in or about 2014.

8. Replace the Stage 1 air compressors that are near their end of life in 2014 and 2015.

Unit 1

1. Undertake a generator stator rewind as part of the 2012 generator overhaul. Initiate planning early in 2011. Undertake the generator actions list in 2010 and 2011.

2. Address issues and action with steam turbine, including work on main and intercept valve issues, stud bolt issues, and turning gear issues as per section **8.2.9 of the report.**

3. Refurbish stack breeching per current plans.
   Where economically feasible, assess and implement those efficiency improvement options for the facility which have short term economic benefits, e.g.:
   a) Addition of reheat boiler tubes to improve reheat steam conditions and cycle efficiency.
   b) Repair of previously damaged (but not fully repaired) steam turbine elements or upgrading existing elements with more efficient designs.

Unit 2

1. Undertake a generator stator rewind as part of 2014 generator overhaul. Initiate pre-work early in 2013. Undertake early generator actions list in 2011.

2. Address issues and actions with steam turbine, including work on main and intercept valve issues, stud bolt issues, and turning gear issues as per section **9.2.9 of the report.**

3. Refurbish stack breeching per current plans.

Where economically feasible, assess and implement those efficiency improvement options for the facility which have short term economic benefits, e.g.:

a) Addition of reheat boiler tubes to improve reheat steam conditions and cycle efficiency.

b) Repair of previously damaged (but not fully repaired) steam turbine elements or upgrading existing elements with more efficient designs.

Unit 3

1. Undertake a generator rotor rewind at the next generator overhaul in 2016 or, with some additional reliability risk, between 2020 and 2022 subject to the findings of the 2016 inspection.

2. Address issues and actions with the steam turbine, including work on main and intercept valve issues, and stud bolt issues as per section **10.2.9 of the report.**

3. Assess the cost-benefit of replacing the existing steam turbine mechanical governor system in 2011 for implementation during the 2013 minor valve outage.

4. Refurbish stack breeching per current plans.

5. For safety reasons, replace the Unit 3 control room relay panels as soon as practical to accommodate the current and required wiring.