A REPORT TO
THE BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

HOLYROOD THERMAL GENERATING STATION

REQUIREMENTS 2011 TO 2020

Newfoundland and Labrador Hydro

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a nalcor energy company

Holyrood Thermal Generating Station Requirements 2011 to 2020

The Holyrood Generating Station (Holyrood), which was initially commissioned in late 1970 (40 years ago), has been and continues to be an essential generating plant in Hydro's Island Interconnected electrical system. This is largely due to the major load growth and lack of other major hydraulic resources on the Avalon Peninsula. The plant's purpose is to supply power and energy as well as capacity support to the Avalon Peninsula due to transmission limitations to this part of the grid. The station provides 466 MW of net capacity and could be called upon to deliver up to 3 TWh of energy to the Island Interconnected system. The plant comprises of two 170 MW units (1970), one 150 MW unit (1981) and a 10 MW gas turbine. Unit 3 currently has the capability to operate as a synchronous condenser and does so during summer months when output from Holyrood is not required. The amount of time it operates in this mode depends on the loading needs, particularly on the Avalon Peninsula. Following a DC infeed, it has been established that units 1 and 2 will also need to have that ability which will require some modifications to the units, similar to that completed on unit 3 previously.

Hydro's hydraulic energy supply capability is subject to inflow conditions that can vary substantially from year to year. While Hydro plans to secure energy supply for a repeat of the firm hydrological sequence (1958-1961), it also responds to annual variation of inflows in its regular operational planning process. Optimized generation dispatch is based on the current situation with respect to reservoir storages, expected snow melt, projected rainfall and forecast customer requirements.

Hydro's projected requirements for Holyrood are based on the load forecast for its utility and industrial customers, as well as Hydro's direct Island Interconnected distribution system customers and internal needs (losses, station services).

The Muskrat Falls Generating Station and interconnection via the Labrador Island Link will displace the current power and energy needs from Holyrood and ultimately change Newfoundland and Labrador's electricity system. In addition, the second interconnection to Nova Scotia via the

Maritime Link will potentially provide options for a short term supply through reserve available outside of the province. First power is currently expected in late 2016 and work is ongoing to finalize sanction of the project(s) and prepare for the integration impacts on the power system.

In the unlikely event there are delays in power delivery, Hydro has a responsibility to take a prudent approach and ensure that Holyrood is available and continues to be a safe and reliable generation source during the transition period.

Prior to interconnection, the demands on Holyrood will increase to serve growing customer requirements. Over the past several years, industrial demand has declined from the closure of two paper mills and reduction at a third, however there is substantial growth occurring particularly on the Avalon Peninsula, which is expected to cause demand to climb back to historical levels and beyond.

Following the full commissioning of the DC interconnections, it is intended that Holyrood will remain operable as a generating station for a number of years before the thermal aspect of the station is decommissioned. At that time, the units will continue to operate as synchronous condensers. The final generation availability year is currently projected to be 2020.

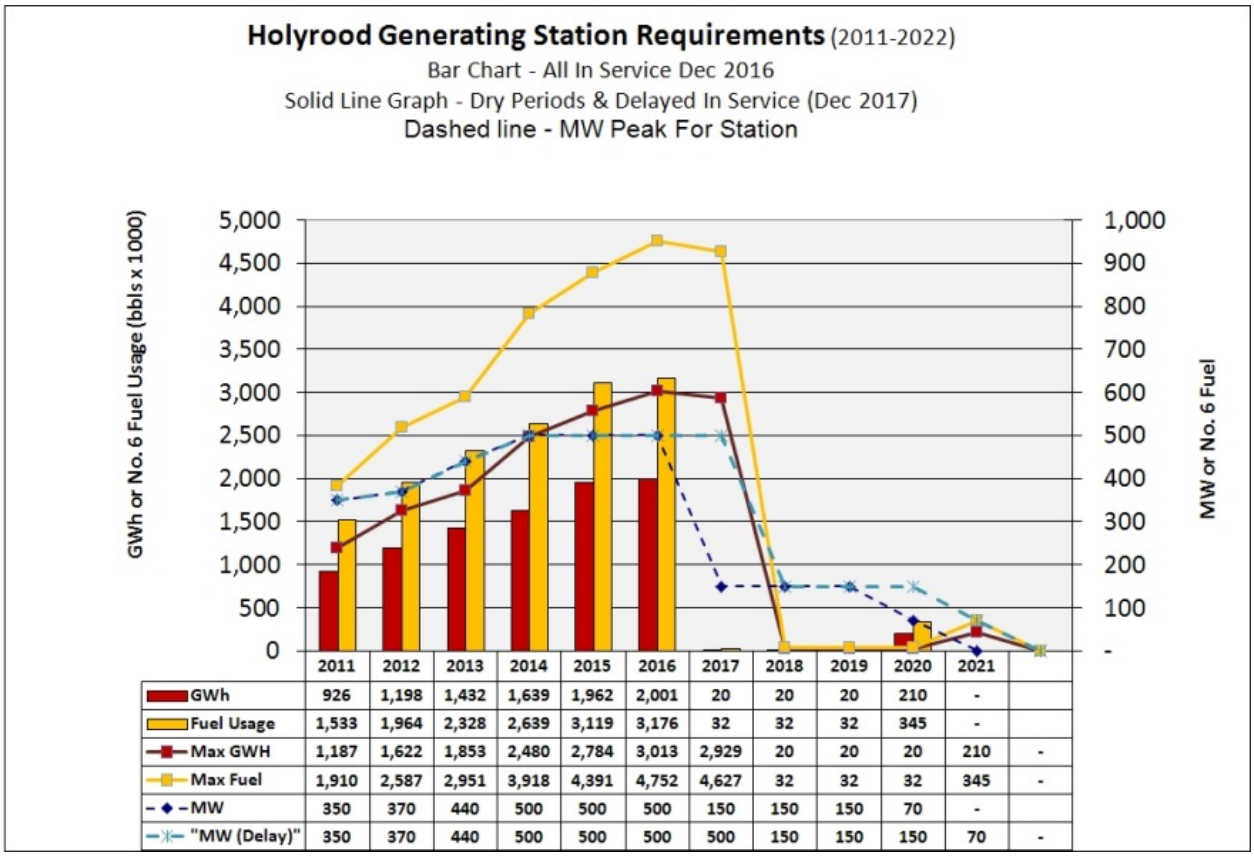
Hydro continues to plan for safe, reliable and least cost operation of the system as it moves towards and transitions to the new operating regime which will be established as a result of the DC infeed to the island. Accordingly, the Holyrood facility must continue to operate until final commissioning of the infeed, and conversion to a synchronous condenser plant. The plant will also be available for a period of time following interconnection as a fully functioning thermal plant as a backup generation source. For planning purposes, Hydro is using 2020 as the approximate year in which Holyrood will also be available for generation after which it will be available for synchronous condenser operation only. Beyond 2020, considerable further capital reinvestment at Holyrood will be required if it were to continue as a power generation source due to the age and condition of the asset.

The current base case is to operate as needed through 2016 and as a backup with minimal operation for 2017 to 2020 (32,000 bbls of oil per year versus three million during 2016). The plan is to operate each unit for a period of time to ensure they are fully operational, and to ensure that staff retains the skills required to keep the complex plant operational in the event there are sustained outages to the DC interconnections during commissioning and initially during operation. The minimum assumption is each unit would operate one week per year - two days at full load and five days at 100 MW to ensure availability. As well, consideration is being given to maintaining one unit in hot stand-by for the first winter season to ensure that unit is available within two hours. With the hot stand-by approach, the fuel use would increase by approximately 60,000 bbls from the minimum.

In 2016, the Holyrood plant will have been in operation for 45 years which is beyond the life of many similar plants. This assumes that carbon emissions from the plant are still tolerated up to that time, which for this limited period is a reasonable assumption. Beyond that period releasing CO_2 at levels necessary at full production may not be acceptable under environmental regulations as government regulations regarding greenhouse gas are likely to change.

The expected base scenario and a maximum Holyrood production scenario are shown in Chart 1.

Chart 1: Forecast Holyrood Generation Requirements



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
GWh	926	1,198	1,432	1,639	1,962	2,001	20	20	20	210	-	
Fuel Usage	1,533	1,964	2,328	2,639	3,119	3,176	32	32	32	345	-	
Max GWH	1,187	1,622	1,853	2,480	2,784	3,013	2,929	20	20	20	210	-
Max Fuel	1,910	2,587	2,951	3,918	4,391	4,752	4,627	32	32	32	345	-
MW	350	370	440	500	500	500	150	150	150	70	-	
"MW (Delay)"	350	370	440	500	500	500	500	150	150	150	70	-

The bar chart elements of the graph are based on average inflow conditions and indicate the energy output expected, as well as the fuel consumed. The dashed line indicates the maximum Holyrood production scenario, in which maximum gross MW output is required from Holyrood to meet customer requirements.

As indicated, the power and energy requirements from Holyrood will increase over the next 5-6 years due to increased industrial and utility demand as we approach the interconnection to Muskrat Falls.

During a poor inflow year, an annual output increase up to 900 GWh could occur. This is a major risk and one Hydro must plan to accommodate. The plant must be ready to produce that level of hydraulic production shortfall, or it could lead to a curtailment of customer load. During a repeat of the critical dry sequence, annual required production from Holyrood, prior to an infeed, would be

significant, up to 3TWh per year. This maximum Holyrood production scenario is represented as the line graphs in Chart 1 for "Max GWh" and "Max Fuel". The sensitivity case assumes a one year delay in the interconnections along with low inflow conditions.

Holyrood must be maintained in a safe, reliable and ready state throughout the build-up to, and transition to, the DC infeed. To continue to ensure the security of supply, capital investment will still be necessary throughout the period 2011 to 2020 to ensure Holyrood can provide the level of service required. Various types of investments and expenditures for the Holyrood facility are anticipated, including: fuel and offloading storage facilities, operator training, skills retention tools, and general plant infrastructure work. As well there will be some operational challenges with respect to ensuring competent employees are attracted, retained and trained for all aspects of operation and maintenance required for this complex plant, and all systems are available, and maintained to continue a reliable level of service.

In summary, the Holyrood Generating Station continues to be a critical asset that must be maintained in a reliable and cost effective state to meet customer demand.

In reviewing the capital needs of the plant, Hydro has considered the time lines discussed above and proposes to submit only those projects necessary for the safe, reliable operation of the plant as a generator up to the time of decommissioning. It is also expected that additional capital investments requirements will continue through to synchronous condenser operation and will be treated as all other capital needs of Hydro which reflect ongoing operational requirements.

Capital projects being put forward as part of this and upcoming budget submissions have been, and will continue to be, reviewed in light of the future plant requirements and are considered to be the minimum amount that is essential to fulfill Hydro's mandate to serve its customers and meet safety and environmental requirements.