

1 Q. **Governance**

2 Provide the current Hydro risk register.

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5 A. Please see PUB-NLH-420 Attachment 1, which is Hydro's current risk register.

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7 Please also refer to Hydro's response to PUB-NLH-417 for the description and status

8 of Nalcor's enterprise risk management policy and framework and Hydro's

9 responses to PUB-NLH-418 and PUB-NLH-419 in relation to the composition and

10 terms of reference of Nalcor's Enterprise Risk Management Committee.

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12 PUB-NLH-420 Attachment 1 contains a limited amount of redacted information due

13 to either: (i) security concerns as to critical components of the electrical system; or

14 (ii) as the information is commercially sensitive and the release of it could

15 negatively impact Hydro in its commercial dealings. The unredacted version of this

16 document will be made available to parties upon request and upon execution of an

17 appropriate non-disclosure agreement.

Newfoundland and Labrador Hydro
Risk Register

A1 = Avoid
M = Mitigate
T = Transfer
A2 = Accept

Risk #	Risk Description	Primary Risk Owner	LOB Manager or Corporate Rep Responsible	Risk Rating	Risk Strategy				Description of Risk Strategy	Residual Risk Following Implementation of Mitigation Strategy	Residual Risk Likelihood 1 to 5	Residual Risk Impact 1 to 5	Residual Risk Rating
					A1	M	T	A2					
1	If there were insufficient policy, procedures, standards, fraudulent activities may occur which could lead to local and possibly national media coverage .	VP HR & OE	Hydro HR Rep.	Medium					1. Establish a regular audit schedule for policies, procedures and standards affecting employee conduct and business operations. 2. Continue to coach employees to corporate values and goals, in particular on <i>Honesty and Trust</i> . 3. Regularly review policy and procedures and update.		1	4	Low
2	If there was a major fire or fuel system loss at isolated diesel site, particularly where no year round road or ship access, service may have to be curtailed or community evacuated due to loss of supply of power.	VP NLH	GM TRO	High					Engineering review of overall diesel plant design strategy. Include fire suppression system review containment options as well as plant layout (example separate building for control room and two or more for gensets). Hatch completed a Diesel Plant Fire Protection Review in 2011/2012 and submitted its final report in March of 2012. The report provided Hydro with recommended fire protection solutions as well as a risk ranking for all of its plants. Based upon this risk ranking Hydro is currently installing fire protection in Hopedale (expected to be completed in Dec 2014) and plans to install fire protection in Nain 2015, and Lanse Au Loup in 2016. The plan is then to continue to do one plant per year , utilizing the risk ranking tool. Other actions that have helped reduce the risk in deisel plants include: design criteria for fuel lines updated, curtains installed between units when operating, all wood removed from diesel plant, and better house keeping practices.	Risk and potential loss reduced.	3	3	Medium
3	If there were insufficient policy, procedures, standards, fraudulent activities may occur which could lead to permanent or long term damage to Business Excellence Goal .	VP HR & OE	Hydro HR Rep.	Medium					1. Establish a regular audit schedule for policies, procedures and standards affecting employee conduct and business operations. 2. Continue to coach employees to corporate values and goals. 3. Regularly review policy and procedures and update.		1	4	Low
4	If there were insufficient control and monitoring , fraudulent/illegal activities may occur which could lead to some unfavourable media coverage .	VP NLH	All Managers	Medium					Increase financial controls by increasing the frequency of checks of credit cards purchases, invoices, timesheets, PHH card transactions, and cell phone transactions. Implement additional restrictions on internet usage and access.	Risk and potential loss reduced.	4	2	Medium
5	If there were insufficient control and monitoring, fraudulent/illegal activities may occur which could lead to inability to complete >70% of scheduled work plan .	VP NLH	All Managers	Medium					Increase financial controls by increasing the frequency of checks of credit cards purchases, invoices, timesheets, PHH card transactions, and cell phone transactions. Implement additional restrictions on internet usage and access.	Risk and potential loss reduced.	4	2	Medium
6	If there were inadequate staff resources, repeated missing of annual performance targets may occur which could lead to inability to complete >70% of scheduled work plan .	VP HR & OE	All Managers	Medium					Continue to monitor effectiveness in completing yearly work plans. Justify additional internal resources (or contractors) where required. Hire staff from local areas to reduce turnover. Monitor EOS results. Succession plan for key positions (eg. P&C Techs). Recruitment and retention plan for rural and remote locations. Review opportunities within Apprenticeship programs including the number and type of apprentice positions required, methods of selection, etc. Implement an agreed upon front-line process for coaching and assessment of training needs of our in-scope employees.	Risk and potential loss reduced.	2	4	Medium

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7	If there were inadequate staff resources, repeated missing of annual performance targets may occur which could lead to employee's being unsatisfied and significant recruitment and retention problems.	VP HR & OE	All Managers	Medium					Continue to monitor effectiveness in completing yearly work plans. Justify additional internal resources (or contractors) where required. Hire staff from local areas to reduce turnover. Monitor EOS results. Succession plan for key positions (eg. P&C Techs). Recruitment and retention plan for rural and remote locations. Review opportunities within Apprenticeship programs including the number and type of apprentice positions required, methods of selection, etc. Implement an agreed upon front-line process for coaching and assessment of training needs of our in-scope employees.	Risk and potential loss reduced.	2	4	Medium
8	If there were employees failing to recognize and manage a hazard, an accident may occur which could lead to the death or serious injury of an employee.	VP HR & OE	All Managers	Medium					Continue education and emphasis on safety reporting, safety culture, safety controls and procedures. Culture vs structure. Relentlessly drive importance of safety performance.	Reduced Likelihood of death or serious injury	2	4	Medium
9	If there was high plant output for an extended period of time due to low water levels, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to the Provincial Department of Environment & Conservation removes permit to operate causing the plant to be shutdown.	VP NLH	Manager SO & IS	Medium					Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against annual volume and intensity projections for low water scenarios. Report to Dept. E&C regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low
10	If there was high plant output for an extended period of time due to low water levels, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to A loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt.	VP NLH	Manager SO & IS	Medium					Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to area stakeholders regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low
11	If there was high plant output for an extended period of time due to low water levels, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to the Provincial Department of Environment & Conservation removes permit to operate causing the plant to be shutdown and Repair time > Maximum Acceptable Downtime.	VP NLH	Manager SO & IS	Low					Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to Dept. E&C regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low

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12	If there was high plant output for an extended period of time due to an extended transmission line failure due to a severe ice storm, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to Regulatory non-compliance with stop work order issued.	VP NLH	Manager SO & IS	Medium				Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to Dept. E&C regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low
13	If there was high plant output for an extended period of time due to an extended transmission line failure due to a severe ice storm, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to) A loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt.	VP NLH	Manager SO & IS	Medium				Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to area stakeholders regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low
14	If there was high plant output for an extended period of time due to an extended transmission line failure due to a severe ice storm, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to the Provincial Department of Environment & Conservation removes permit to operate causing the plant to be shutdown and Repair time > Maximum Acceptable Downtime .	VP NLH	Manager SO & IS	Low				Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to Dept. E&C regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low
15	If there was high plant output for an extended period of time due to an extended transmission line failure due to a severe wind storm, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to Regulatory non-compliance with stop work order issued.	VP NLH	Manager SO & IS	Low				Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to area stakeholders regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low
16	If there was high plant output for an extended period of time due to an extended transmission line failure due to a severe wind storm, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to A loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt	VP NLH	Manager SO & IS	Low				Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to area stakeholders regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low
17	If there was high plant output for an extended period of time due to an extended transmission line failure due to a severe wind storm, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to the Provincial Department of Environment & Conservation removes permit to operate causing the plant to be shutdown and Repair time > Maximum Acceptable Downtime.	VP NLH	Manager SO & IS	Low				Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to Dept. E&C regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low

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21	If there was high plant output for an extended period of time due to an extended transmission line failure due to an earthquake, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to Regulatory non-compliance with stop work order issued.	VP NLH	Manager SO & IS	Low					Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to area stakeholders regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low
22	If there was high plant output for an extended period of time due to an extended transmission line failure due to an earthquake, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to A loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt .	VP NLH	Manager SO & IS	Low					Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to area stakeholders regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low
23	If there was high plant output for an extended period of time due to an extended transmission line failure due to an earthquake, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to the Provincial Department of Environment & Conservation removes permit to operate causing the plant to be shutdown and Repair time > Maximum Acceptable Downtime.	VP NLH	Manager SO & IS	Low					Carry out stack testing for high output levels to assess emission compliance. Implement the least cost option to ensure all contaminants meet regulatory compliance levels at high output levels. Monitor regulations and assess against volume and intensity projections for low water scenarios. Report to Dept. E&C regularly.	Stack testing of the 0.7% sulphur has been completed. When the report on emission modelling has been completed recommendations to correct for any potential regulatory exceedance issues will be implemented.	1	4	Low

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24	If there were improper operating controls, a major fuel spill into the environment at an off-loading or storage facility may occur which could lead to regulatory non-compliance with stop work order issued with extended clean-up effort required .	VP NLH	Manager SO & IS	Medium					Continued compliancy with ISO 14001 supplemented with improved in-house environmental response capability. Maintain communication with federal/provincial and contracted environmental response agencies. Conduct annual Oil Spill Emergency Plan Exercises with federal and provincial response agencies. Develop and implement Marine Terminal Guidelines to provide safety regs/terminal facilities conditions and services available to Tanker Captains prior to discharging fuel oil. Develop and implement spill response procedures specific to fuel transfers to tankers at HTGS. Adhere to recommended preventative maintenance for HTGS terminal equipment, and operational procedures	Continued training/education and enhanced spill response qualifications for HTGS personnel responsible for off-loading and storage of fuel. Multi-jurisdictional (HTGS, CCG, ECRC) spill response exercises conducted in 2011 and annual exercises planned. Marine Terminal Guidelines document/manual developed and implemented at HTGS in 2011. Oil Spill Response Training provided in 2012 with additional courses planned for 2013. Oil Pollution Emergency Plan updated and forwarded to Transport Canada for review in 2013.	2	4	Medium
25	If there were improper operating controls, a major fuel spill into the environment at an off-loading or storage facility may occur which could lead to A loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt .	VP NLH	Manager SO & IS	Medium					Continued compliancy with ISO 14001 supplemented with improved in-house environmental response capability. Maintain communication with federal/provincial and contracted environmental response agencies. Conduct annual Oil Spill Emergency Plan Exercises with federal and provincial response agencies. Develop and implement Marine Terminal Guidelines to provide safety regs/terminal facilities conditions and services available to Tanker Captains prior to discharging fuel oil. Develop and implement spill response procedures specific to fuel transfers to tankers at HTGS. Adhere to recommended preventative maintenance for HTGS terminal equipment and review the tank farm drainage design to seek improvements through consultants.	Continued training/education and enhanced spill response qualifications for HTGS personnel responsible for off-loading and storage of fuel. Multi-jurisdictional (HTGS, CCG, ECRC) spill response exercises conducted in 2011 with annual exercises planned. Marine Terminal Guidelines document/manual developed and implemented at HTGS in 2011. Oil Spill Response Training provided in 2012 with additional courses planned for 2013. Oil Pollution Emergency Plan updated and forwarded to Transport Canada for review in 2013.	2	4	Medium
26	If there were improper operating controls, a major fuel spill into the environment at an off-loading or storage facility may occur which could lead to an extended shutdown of the Holyrood TGS and Repair time > Maximum Acceptable Downtime.	VP NLH	Manager SO & IS	Medium					Continued compliancy with ISO 14001 supplemented with improved in-house environmental response capability. Maintain communication with federal/provincial and contracted environmental response agencies. Conduct annual Oil Spill Emergency Plan Exercises with federal and provincial response agencies. Develop and implement Marine Terminal Guidelines to provide safety regs/terminal facilities conditions and services available to Tanker Captains prior to discharging fuel oil. Develop and implement spill response procedures specific to fuel transfers to tankers at HTGS. Adhere to recommended preventative maintenance for HTGS terminal equipment.	Continued training/education and enhanced spill response qualifications for HTGS personnel responsible for off-loading and storage of fuel. Multi-jurisdictional (HTGS, CCG, ECRC) spill response exercises conducted in 2011 with annual exercises planned. Marine Terminal Guidelines document/manual developed and implemented at HTGS in 2011.	1	4	Low
28	If there was rapid Industrial Growth, very high generation costs in the province may occur which could lead to a loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt .	VP SO&P	Manager SO & IS	Low							1	4	Low

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31	If there was a fire in the ECC, loss of control of the power system by the ECC may occur which could lead to Loss of a physical asset that causes a significant disruption in delivery of essential services .	VP SO&P	Manager SO & IS	Low					Backup Control Centre in place.	Risk likelihood reduced.	1	4	Low
32	If there was a fire in the ECC, loss of control of the power system by the ECC may occur which could lead to A loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt .	VP SO&P	Manager SO & IS	Low					Backup Control Centre in place.	Risk likelihood reduced.	1	4	Low
35	If there was a loss of power to the ECC, loss of control of the power system by the ECC may occur which could lead to Loss of a physical asset that causes a significant disruption in delivery of essential services .	VP SO&P	Hydro Controller	Low					Redundant back-up supplies are in place along with a Back-up ECC. Systems being maintained with regular testing of back-up.		1	4	Low

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36	If there was a loss of power to the ECC, loss of control of the power system by the ECC may occur which could lead to a loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt .	VP SO&P	Hydro Controller	Low					Redundant back-up supplies are in place along with a Back-up ECC. Systems being maintained with regular testing of back-up.		1	4	Low
37	If there were insufficient resources deployed, Environmental Management System failures may occur which could lead to destruction of Environmental Leadership Goal due to failure to meet public commitments .	VP HR & OE	All Managers	Medium					Continued investment of required resources to maintain and develop environmental protection policy thereby meeting leadership goals and public commitment. Continue to monitor the effectiveness of the environment management program (ISO 14001). Justify additional internal resources (or contractors) where required. Adjust level of expectations for environmental programs to meet department resource capability. More careful assessment of commitment required to satisfactorily complete programs/initiatives.	Maintenance of EMS through auditing and continued improvement.	1	4	Low
38	If there were insufficient resources deployed , Environmental Management System failures may occur which could lead to a loss in stakeholder trust/commitment that is doubtful it can be rebuilt due to public concern of lack of commitment .	VP HR & OE	All Managers	Medium					Continued investment of required resources to maintain and develop environmental protection policy thereby meeting leadership goals and public commitment. Continue to monitor the effectiveness of the environment management program (ISO 14001). Justify additional internal resources (or contractors) where required. Adjust level of expectations for environmental programs to meet department resource capability. More careful assessment of commitment required to satisfactorily complete programs/initiatives.	Maintenance of EMS through auditing and continued improvement.	1	4	Low
39	If there was a severe rain fall, a dam failure may occur which could lead to Loss of all generation capability from a critical hydroelectric Generating Station.	VP NLH	Manager Hydro Generation	Low					All Hydro Generation Dams are designed to handle maximum flood conditions. Precipitation and Reservoir Water Elevations are monitored daily by ECC Personnel to ensure proper actions are taken to maintain proper water elevations.	Monitoring of Precipitation and Reservoir Water Elevations performed daily by ECC Hydrology Personnel.	1	4	Low

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40	If there was inadequate maintenance of structures, a dam failure may occur which could lead to damage to natural habitat, people or property resulting in local and possibly national media coverage. (2.140)	VP NLH	Manager SO & IS, Manager Hydro Generation	Low					1. Review of Dams/Dykes by Dyke Board of Consultants on annual basis. 2. Review and action on underwater diving inspections. 3. Review and action on Dam Safety Reviews conducted by external consultants. 4. Review and action on Regular Dam/Dyke Surveillance Data. 5. Review and action on outstanding corrective maintenance work orders	All Risk Strategies have been implemented.	1	4	Low
41	If there were inadequate operating controls, a dam failure may occur which could lead to damage to natural habitat, people or property resulting in local and possibly national media coverage. (2.140)	VP NLH	Manager SO & IS, Manager Hydro Generation	Medium					Develop strict operating procedures for ECC staff when no direction available from engineering staff. Enhance training of ECC staff to include regular review of reservoir operating limits and flood control procedures. Include documented testing with pass levels established.	As the frontline to control action, the ECC shift has full and clear responsibility to enact flood control action unless otherwise directed by authorized engineering staff.	1	4	Low
42	If there were inadequate maintenance of structures a dam failure may occur which could lead to damage to natural habitat, people or property resulting in extended clean-up effort required. (2.140)	VP NLH	Manager SO & IS, Manager Hydro Generation	Low					1. Review of Dams/Dykes by Dyke Board of Consultants on annual basis. 2. Review and action on underwater diving inspections. 3. Review and action on Dam Safety Reviews conducted by external consultants. 4. Review and action on Regular Dam/Dyke Surveillance Data. 5. Review and action on outstanding corrective maintenance work orders	All Risk Strategies have been implemented risk should be reduced as a result.	1	4	Low
43	If there were inadequate operating controls, a dam failure may occur which could lead to damage to natural habitat, people or property resulting in extended clean-up effort required. (2.140)	VP NLH	Manager SO & IS, Manager Hydro Generation	Medium					Develop strict operating procedures for ECC staff when no direction available from engineering staff. Enhance training of ECC staff to include regular review of reservoir operating limits and flood control procedures. Include documented testing with pass levels established.	As the frontline to control action, the ECC shift has full and clear responsibility to enact flood control action unless otherwise directed by authorized engineering staff.	1	4	Low

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44	If there was a failure to perform adequate preventive or corrective maintenance, a dam failure may occur which could lead to Loss of all generation capability from a critical hydroelectric Generating Station.	VP NLH	Manager SO & IS, Manager Hydro Generation	Low					1. Review of Dams/Dykes by Dyke Board of Consultants on annual basis. 2. Review and action on underwater diving inspections. 3. Review and action on Dam Safety Reviews conducted by external consultants. 4. Review and action on Regular Dam/Dyke Surveillance Data. 5. Review and action on outstanding corrective maintenance work orders	All Risk Strategies have been implemented and a result risk should be reduced	1	4	Low
45	If there were inadequate operating controls, a dam failure may occur which could lead to Loss of all generation capability from a critical hydroelectric Generating Station.	VP NLH	Manager SO & IS, Manager Hydro Generation	Medium					Develop strict operating procedures for ECC staff when no direction available from engineering staff. Enhance training of ECC staff to include regular review of reservoir operating limits and flood control procedures. Include documented testing with pass levels established.	As the frontline to control action, the ECC shift has full and clear responsibility to enact flood control action unless otherwise directed by authorized engineering staff.	1	4	Low
47	If there was a lack of an asset management strategy for key assets, failure of physical assets may occur which could lead to a major facility being unable to operate.	VP PETS	All Managers	Medium					Develop and implement an Asset Management Framework and modified organization structure with clear accountabilities for asset maintenance, critical spares, establishing corporate performance measures and well documented financial requirements to meet performance objectives.	Implemented Framework. The financial resources will align much better with performance objectives thus reducing the likelihood of a failure. Adequate resources to achieve this vision an important factor to achieve success.	1	4	Low

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48	If there was a cooling water piping or spherical valve control failure, flooding of the Bay d'Espoir plant may occur which could lead to the Bay d'Espoir Plant being unable to operate .	VP NLH	Manager Hydro Generation	Medium					Spherical Valves and spherical Valve Control Piping is set up in a pm program and checked on a an annual basis. Follow procedure which has been developed to handle a penstock rupture.	PM Program and Emergency Procedure to deal with penstock rupture will reduce risk	1	4	Low
49	If there was a a penstock rupture due to heavy equipment operating on it, flooding of the Bay d'Espoir plant may occur which could lead to the Bay d'Espoir Plant being unable to operate .	VP NLH	Manager Hydro Generation	Medium					1. Inspect bridges annually 2. Post Speed Limit Signs 3. Technical Services has been requested to provide load capacities for the bridges. When this info is made available, Load Capacity Signs will be posted as well.	Bridges are inspected annually as part of that particular road inspection. Speed Limit signs have been posted as well. Those strategies will reduce risk.	1	3	Low

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50	If there was a fire in the Bay d'Espoir plant, damage to the units may occur which could lead to the plant being unable to operate .	VP NLH	Manager Hydro Generation	Medium					1. Check Fire Panels and Inergen Systems on Annual Basis using a certified inspector. 2. Conduct regular Fire Equipment Inspections in Plant 3. Check Flow Capacity of Fire Water System on Annual Basis 4. Test Transformer Deluge Systems Annually. 5. Test Generator Deluge Systems Annually 6. Recommend automating generator deluge systems on Bde units #1-#7	1. Inspection of Fire Panels and Inergen Systems by a certified inspector began 2009. Fire Equipment Inspections are conducted regularly by Plant Personnel and also by FM Global People. Flow Capacity is checked and recorded annually by FM during their annual inspections of all Hydro Plants. Capital Proposals in 20 Year Plan to Automate or Semi Automate the Generator Deluge Systems. Those strategies will reduce risk.	2	3	Medium

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					A1	M	T	AZ					
51	If there was a fire in the Holyrood plant, damage to the units may occur which could lead to the plant being unable to operate .	VP NLH	Manager Thermal Generation	Medium					Adopt FM Global approved hot work permit system that puts enhanced controls around contractor activities. Development of Emergency Shut-down Procedures (fire-related) for Turbine/Generator Units and associated equipment. These shut-down procedures describe the most suitable course of action for protecting assets and reducing downtime in case of a fire. Procedures with HTGS Operations staff commenced in 2012.	Risk and potential loss reduced.	2	4	Medium
52	If there was a failure of hydrogen supplier, the Holyrood plant may run out of hydrogen resulting in the plant being down for more than the maximum acceptable down time.	VP NLH	Manager Thermal Generation	High					Put in place in house capability to produce hydrogen. Capital Project to upgrade the hydrogen gas storage and control system. Work includes installing a new electrolyzer for on-site production of hydrogen. Control panels, pipes and valves will be replaced and automatic vent valves installed, thus eliminating the requirement for the transportation of bulk pack hydrogen.	Capital plan will eliminate the risk by replacing the high pressure bulk packs with an electrolyzer for on-site production of hydrogen gas. This project will also reduce the exposure of the valve stations to vibration by relocating them farther away from the generating units, thus reducing the risk of leaks. Installation of remote control hydrogen vents, reduces the risk to personnel who may have to release the gas in the event of an emergency.	2	4	Medium
53	If there was severe weather (ice storm, snow storm, wind storm, etc.), damage to physical assets may occur which could lead to a major facility being unable to operate .	VP NLH	All Managers	Medium					Continue CM and PM programs and implement / revise asset management strategies. 11 Jan 2013 incident at HTGS has highlighted the necessity to re-visit current risk strategy for the switchyard. Issues were related to breaker insulation breakdown due to salt and wet snow. Replacement and application of coatings on insulators implemented along with breaker replacements with higher insulating properties. Implemented enhanced storm preparation protocols to prepare for potential trouble areas including dispatching staff for improved response time.	Risk and potential loss reduced.	1	3	Low

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54	If there was non-adherence with proper internal control, fraudulent activity may occur, resulting in loss of assets.	VP NLH	All Managers	Low					Increase financial controls by increasing the frequency checks of credit card purchases, invoices, timesheets, PHH card transactions, and cellphone transactions. Implement additional restrictions on internet access and usage. Ensure call out for intruder alarms are promptly addressed.	Risk and potential loss reduced.	4	1	Low
55	If there was collusion fraudulent activity may occur leading to/resulting in loss of assets.	VP NLH	All Managers	Low					Increase financial controls by increasing frequency of checks of credit card purchases, invoices, timesheets, PHH card transactions, and cell phone transactions. Implement additional internet access and usage restrictions.	Risk and potential loss reduced.	3	1	Low
56	If there were significant replacement costs for failed assets due to aging infrastructure, Hydro's ability to operate in a commercially viable manner is negatively impacted, which could lead to the temporary shut down of a facility or line of business.	VP NLH	All Managers	Low					Twenty Year Capital Plan and Five Year Operating Plan	Those two plans will reduce the likelihood of having to shut down a facility as a result of significant replacement costs due to aging infrastructure.	1	4	Low
58	If there was insufficient allocation of financial resources, repeated missing of annual performance targets may occur which could lead to loss of a physical asset that causes a disruption in performance without suspending operations.	CFO	All Managers, Hydro Controller	Medium					Asset Management Framework developed with clear accountabilities for establishing corporate performance measures and well documented financial requirements to meet performance objectives. Tools available with reporting processes to enable timely analysis for decision making.	Risk reduced.	1	4	Low
59	If there was insufficient allocation of financial resources, repeated missing of annual performance targets may occur which could lead to employee's being unsatisfied and significant recruitment and retention problems.	CFO	All Managers, Hydro Controller	Medium					Develop better budget justifications based on operational requirements. Work with HR&OE to continually improve the recruitment and retention strategy. Mentor appropriate staff.	Align Senior staff with identified junior employees to develop required skill set over long term.	2	3	Medium
60	If there was information shared across lines of business, conflicts of interest may occur which could lead to a loss of stakeholder trust/commitment that is doubtful whether it can be rebuilt.	CEO	Hydro HR Rep.	Medium					Monitor for lines of business changes to determine appropriate strategies.	Risk reduced.	1	4	Low
61	If there was a report of respiratory death in region of plant, high public concern for the level of emissions from the Holyrood TGS may occur which could lead to Destruction of Environmental Leadership Goal due to public perception.	VP NLH	Manager Thermal Generation	Medium					Continued compliance with regulatory limits and open communication through CLC meetings is key to demonstrating environmental leadership and avoiding poor public perception. Plant production reducing in 2017/8 and being retired in 2020/21.	Reiteration of past health risk studies and plant emission performance at the CLC level or if necessary establish public meeting to present past health risk studies with the help of professional consultation.	1	4	Low

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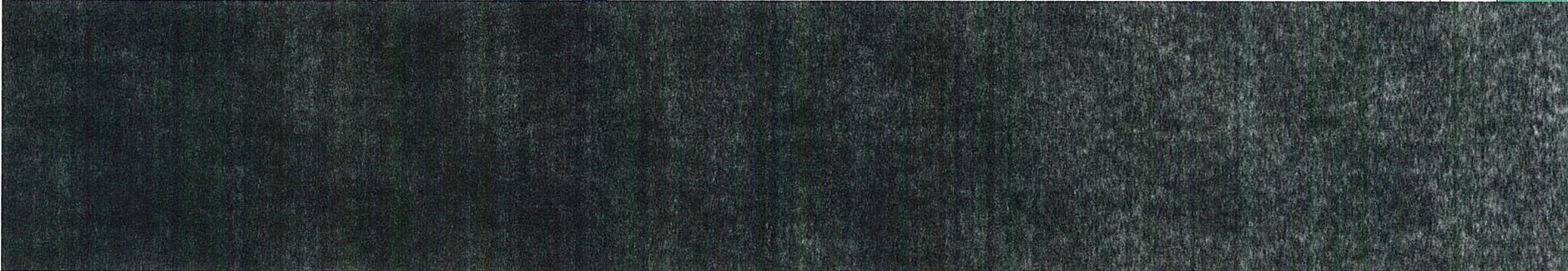
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62	If there was a report of respiratory death in region of plant, high public concern for the level of emissions from the Holyrood TGS may occur which could lead to a loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt.	VP NLH	Manager Thermal Generation	Medium					Continued compliance with regulatory limits and open communication through CLC meetings is key to demonstrating environmental leadership and avoiding poor public perception. Plant production reducing in 2017/8 and being retired in 2020/21.	Reiteration of past health risk studies and plant emission performance at the CLC level or if necessary establish public meeting to present past health risk studies with the help of professional consultation.	1	4	Low
63	If there was a report that the Holyrood plant's emission controls are behind the standard at other similar plants in North America, high public concern for the level of emissions from the Holyrood TGS may occur which could lead to Destruction of Environmental Leadership Goal due to public perception.	VP NLH	Manager Thermal Generation	Medium					Utilize the industry standard CEMS system to monitor emissions in conjunction with dispersion modeling to predict future impacts to assess possibility fuel improvements such as sulfur reduction. Continue open communications with CLC with respect to emission control efforts.	Review and implement new emission controls where possible and communicate with CLC.	1	4	Low
64	If there was a report that the plant's emission controls are behind the standard at other similar plants in North America, high public concern for the level of emissions from the Holyrood TGS may occur which could lead to a loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt.	VP NLH	Manager Thermal Generation	Medium					Utilize the industry standard CEMS system to monitor emissions in conjunction with dispersion modeling to predict future impacts to assess possibility fuel improvements such as sulfur reduction. Continue open communications with CLC with respect to emission control efforts.	Review and implement new emission controls where possible and communicate with CLC.	1	4	Low
65	If there was a new large industrial load prior to HVDC, production increases at Holyrood TGS with very high emission amounts may occur which could lead to destruction of Environmental Leadership Goal due to failure to meet public commitment to reductions .	VP SO&P	Manager System Planning	Medium					The probability of a new large load materializing prior to the HVDC is low but in that event, Hydro would alter its expansion plans accordingly any increase in Holyrood emissions would only be temporary	in the event a new load materializes initiate a public relations blitz to inform the public of the impact on Holyrood production and emission and insure them the impact is only temporary	2	2	Low
66	If there was a new large industrial load prior to HVDC, production increases at Holyrood TGS with very high emission amounts may occur which could lead to a loss in stakeholder trust/commitment that is doubtful it can be rebuilt due to public concern of level.	VP SO&P	Manager System Planning	Medium					The probability of a new large load materializing prior to the HVDC is low but in that event, Hydro would alter its expansion plans accordingly any increase in Holyrood emissions would only be temporary	in the event a new load materializes initiate a public relations blitz to inform the public of the impact on Holyrood production and emission and insure them the impact is only temporary	2	2	Low
67	If there was climate change impacting hydrology, production increases at Holyrood TGS with very high emission amounts may occur which could lead to destruction of Environmental Leadership Goal due to failure to meet public commitment to reductions.	VP SO&P	Manager System Planning	Medium					As this is an accepted mode of operation during low water conditions and the fact that emissions at Holyrood will return to normal levels once water levels recover there is no requirement for a mitigation strategy other than to inform the public the situation is temporary	In the event a low water condition occurs initiate a public relations blitz to inform the public of the situation and assure them it is temporary in nature	2	2	Low
68	If there was climate change impacting hydrology, production increases at Holyrood TGS with very high emission amounts may occur which could lead to a loss in stakeholder trust/commitment that is doubtful it can be rebuilt due to public concern of level .	VP NLH	Manager System Planning	Medium					As this is an accepted mode of operation during low water conditions and the fact that emissions at Holyrood will return to normal levels once water levels recover there is no requirement for a mitigation strategy other than to inform the public the situation is temporary	In the event a low water condition occurs initiate a public relations blitz to inform the public of the situation and assure them it is temporary in nature	2	2	Low

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69	If there was an epidemic affecting ECC staff, loss of control of the power system by the ECC may occur which could lead to repair time > maximum acceptable downtime.	VP HR & OE	Manager SO & IS	Medium				Monitor pandemic reports from health agencies. A plan was developed due to the concern of the H1N1 pandemic. The plan may not reduce the probability to "extremely unlikely", due to the necessary close quarters in the ECC where a one day exposure may impact 5 of 11 staff.		2	4	Medium
70	If there was an epidemic affecting ECC staff, loss of control of the power system by the ECC may occur which could lead to a loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt.	VP HR & OE	Manager SO & IS	Medium				Monitor pandemic reports from health agencies. A plan was developed due to the concern of the H1N1 pandemic. The plan may not reduce the probability to "extremely unlikely", due to the necessary close quarters in the ECC where a one day exposure may impact 5 of 11 staff. Staff also socialize with each other.		2	4	Medium
71	If there was an epidemic affecting Holyrood staff, loss of control of Holyrood may occur which could lead to loss of the use of physical asset that causes a significant disruption in delivery of essential services.	VP NLH	Manager Thermal Generation	Low				Monitor pandemic reports from health agencies. Highlight essential personnel and critical tasks to maintain safe operation of HTGS in event of pandemic. Follow industry best practice for this risk. Staffing criticality reviewed, installation of hand sanitizers and supporting corporate plan.		1	3	Low
72	If there was an epidemic affecting Holyrood staff, loss of control of Holyrood may occur which could lead to a loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt.	VP NLH	Manager Thermal Generation	Low				Monitor pandemic reports from health agencies. Highlight essential personnel and critical tasks to maintain safe operation of HTGS in event of pandemic. Follow industry best practice for this risk. Staffing criticality reviewed, installation of hand sanitizers and supporting corporate plan.		1	3	Low
73	If there was an epidemic affecting Holyrood staff, loss of Holyrood may occur which could lead to an extended loss of the Holyrood GS.	VP HR & OE	Manager Thermal Generation	Low				Monitor pandemic reports from health agencies. Highlight essential personnel and critical tasks to maintain safe operation of HTGS in event of pandemic. Follow industry best practice for this risk. Staffing criticality reviewed, installation of hand sanitizers and supporting corporate plan.		1	3	Low



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76	If there was climate change driven drought, low water inflows to reservoirs may occur which could lead to the hydroelectric facilities being unable to produce sufficient energy for the Province.	VP SO&P	Manager System Planning	Medium				The System Operation department as part of the regular hydrological review confirm the firm energy capability of the system. Any variations in firm energy should be communicated to the System Planning department to be incorporated in the long term planning exercise	Once a permanent reduction in firm energy capability has been identified System Planning will modify expansion plan accordingly to compensate for change	2	2	Low
77	If there was a regulated rate increases, regulated operations may suffer a loss of credibility, leading to/resulting in reduced reputation and support within the community	VP NLH	Hydro Controller	Medium				Increase communication within community. Hold scheduled meetings with target audience to explain regulatory cost of service and dollars.		2	2	Low
78	If there was excessive down time (i.e. ice storm), regulated operations may suffer a loss of credibility, leading to/resulting in reduced reputation and support within community	VP NLH	All Managers	Medium				Accurate communication on current status of repairs and expected restoration.	Risk and potential loss reduced.	2	3	Medium
79	If there were unfulfilled commitments, regulated operations may suffer a loss of credibility, leading to/resulting in reduced reputation and support within the community	VP NLH	All Managers	Medium				Accurate communication as to what can realistically be achieved.	Risk and potential loss reduced.	2	3	Medium
80	If there was a severe rain fall, a dam failure may occur which could lead to damage to natural habitat, people or property resulting in extended clean-up effort required.	VP NLH	Manager Hydro Generation	Low				1. Review of Dams/Dykes by Dyke Board of Consultants on annual basis. 2. Review and action on underwater diving inspections. 3. Review and action on Dam Safety Reviews conducted by external consultants. 4. Review and action on Regular Dam/Dyke Surveillance Data. 5. Review and action on outstanding corrective maintenance work orders	All Risk Strategies have been implemented.	1	4	Low

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81	If there was a severe rain fall, a dam failure may occur which could lead to damage to natural habitat, people or property resulting in local and possibly national media coverage.	VP NLH	Manager Hydro Generation	Low					1. Review of Dams/Dykes by Dyke Board of Consultants on annual basis. 2. Review and action on underwater diving inspections. 3. Review and action on Dam Safety Reviews conducted by external consultants. 4. Review and action on Regular Dam/Dyke Surveillance Data. 5. Review and action on outstanding corrective maintenance work orders	All Risk Strategies have been implemented.	1	4	Low
82	If there was a lack of measured oversight and feedback systems, Environmental Management System failures may occur which could lead to destruction of Environmental Leadership Goal due to failure to meet public commitments.	VP HR & OE	Hydro HR Rep.	Low							1	4	Low
83	If there was a lack of measured oversight and feedback systems, Environmental Management System failures may occur which could lead to a loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt due to public concern of lack of commitment .	VP HR & OE	Hydro HR Rep.	Low							1	4	Low
84	If there was a climate change driven drought, very high generation costs in the province may occur which could lead to a greater than 60% rate increase.	VP NLH	Hydro Controller	Low							1	4	Low
85	If there was a change in Federal regulations, Holyrood TGS emissions exceeding regulatory compliance levels may occur.	VP SO&P	Manager System Planning	Medium					Hydro is actively involved in discussions with the Federal Govt. and other stake holders involved with establishing new emission reg. All indications are that changes will be phased in and utilities will be given ample time to become compliant with the new regs. Plant production reducing in 2017/8 and being retired in 2020/21.		2	2	Low
86	If there was a change in Federal regulations, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to a loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt.	VP SO&P	Manager System Planning	Medium					Hydro is actively involved in discussions with the Federal Govt. and other stake holders involved with establishing new emission reg. All indications are that changes will be phased in and utilities will be given ample time to become compliant with the new regs. Plant production reducing in 2017/8 and being retired in 2020/21.		2	2	Low

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87	If there was a change in Federal regulations, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to the Provincial Department of Environment & Conservation removes permit to operate causing the plant to be shutdown.	VP NLH	Manager Thermal Generation	Low					Continue to communicate with federal DOE and provincial DOE and implement required changes prior to promulgation of regulations. Expediently implement changes. Plant production reducing in 2017/8 and being retired in 2020/21.	1	4	Low	
88	If there was a change in regulations by Provincial Government, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to failure to be compliant.	VP NLH	Manager Thermal Generation	Low					Continue to communicate with NDOEC and implement required changes prior to promulgation of regulations. Expediently implement changes. Plant production reducing in 2017/8 and being retired in 2020/21.	1	4	Low	
89	If there was a change in regulations by Provincial Government, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to a loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt.	VP NLH	Manager Thermal Generation	Low					Continue to communicate with NDOEC and implement required changes prior to promulgation of regulations. Expediently implement changes. Plant production reducing in 2017/8 and being retired in 2020/21.	1	4	Low	
90	If there was a change in regulations by Provincial Government, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to the Provincial Department of Environment & Conservation removes permit to operate causing the plant to be shutdown.	VP NLH	Manager Thermal Generation	Low					Continue to communicate with NDOEC and implement required changes prior to promulgation of regulations. Expediently implement changes. Plant production reducing in 2017/8 and being retired in 2020/21.	1	4	Low	
91	If there was an improper combustion caused by equipment failure or human error at the plant, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to failure to be compliant.	VP NLH	Manager Thermal Generation	Medium					A QC and PM program is established for the CEMS to ensure data integrity.	2	3	Medium	
92	If there was an improper combustion caused by equipment failure or human error at the plant, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to local media coverage only.	VP NLH	Manager Thermal Generation	Medium					A QC and PM program is established for the CEMS to ensure data integrity.	2	3	Medium	
93	If there was an improper combustion caused by something in the plant, Holyrood TGS emissions exceeding regulatory compliance levels may occur which could lead to the Provincial Department of Environment & Conservation removes permit to operate causing the plant to be shutdown.	VP NLH	Manager Thermal Generation	Medium					A QC and PM program is established for the CEMS to ensure data integrity.	1	4	Low	

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94	If there was a change in Federal Regulations, very high generation costs in the province may occur which could lead to a greater than 60% rate increase.	VP NLH	Hydro Controller	Low						1	4	Low	
95	If there was a fire in a 230 kV Terminal Station, protection and control equipment could be destroyed that could lead to an extensive power outage to a large number of customers	VP NLH	GM TRO	Medium				Engineering review 230 kV terminal station control room design to determine the requirement for fire protection or detection systems .	The implementation of the outcome will reduce the impact .	2	3	Medium	
96	If there was an epidemic affecting TRO staff, inability to respond to power outages may occur which could lead to loss of a physical asset that causes a disruption in performance without suspending operations	VP NLH	GM TRO	Low				Monitor pandemic reports from health agencies. A plan was developed due to the concern of the H1N1 pandemic.		1	3	Low	
97	If there was an epidemic affecting TRO staff, inability to respond to power outages may occur which could lead to Local media coverage only.	VP NLH	GM TRO	Low				Monitor pandemic reports from health agencies. A plan was developed due to the concern of the H1N1 pandemic .		1	3	Low	
100	If there was a loss of Administration computer room equipment by a fire or flood administration systems would not be unavailable	VP Finance	Manager of Information Systems	Medium				Have disaster recovery plan in place to replace Admin Computer room at an offsite location giving access to systems to a limited amount of users.	Risk and potential loss reduced.	2	2	Low	
101	If there was a loss of energy management computer room and equipment by a fire or flood energy management system unavailable	VP SO&P	Manager of Information Systems	Medium				Have backup control centre.	Risk and potential loss reduced.	3	2	Low	
102	If there was no clear record of accountability of the corporation's regulatory or contractual reporting and notification obligations, a nonconformance to regulatory or contractual obligations may occur resulting in cost increases through fines, legal costs or other increased operating costs.	VP Legal	Senior Legal Counsel	Medium				A review will be done to evaluate a process and procedure and potential tool to allow recording of all dated reporting, notification or renewal and expiration dates, likely in a corporate wide database and action tool.	Risk and potential loss reduced in that notification will be initiated to the party responsible or at least management for consideration and action.	3	2	Low	

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104	If there was a failure of the Raw Water Line at Holyrood, water supply may be interrupted which may result in the Plant being shutdown for more than the acceptable maximum downtime.	VP NLH	Manager Thermal Generation	Medium					Capital Project implemented for emergency water pumping capability from dam to fire water distribution system at HTGS. This allows water to be piped above ground in the event of a rupture of the main water line at Quarry Brook Dam. Develop procedure and train personnel to operate equipment.	Risk and potential loss reduced.	1	4	Low
105	If as a result of Holyrood's Gas Turbine unavailability, power supply may be interrupted which may result in the Plant being shutdown for more than the acceptable maximum downtime	VP NLH	Manager Thermal Generation	Medium					Utilizing Hardwoods GT and 2 separate lines, black start can be provided. Risk Strategy is for new C/T planned now for late 2014 installation. Implemented black start diesel units strategy late in 2013.	Likelihood reduced	1	4	Low
106	If there was a fire and subsequent rupture in the 16" Fuel Oil line in Holyrood, fuel supply may be interrupted which may result in the Plant being shutdown for more than the acceptable maximum downtime	VP NLH	Manager Thermal Generation	Medium					Capital Project Proposal to supply and install manual /remote emergency shut off valves on the inside fuel supply line to the boilers and from main tanks outside the powerhouse. Supply and install fire-proofing on all hangars that support the 16" fuel line in the Powerhouse.	Risk and potential loss reduced	2	3	Medium

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108	If there was poor fuel quality, component failure throughout the HTGS fuel system may occur which may result in the Thermal Operation being shutdown for more than the acceptable maximum downtime	VP NLH	Manager Thermal Generation	Medium					Supplier notified and has adjusted the fuel supplied to prevent the problems experienced in 2013. Engage external expert to determine fuel specification which will result in further reduction in fuel quality related fuel system damage. Shipments are monitored at load port for silicon and aluminium to allow for action to be taken. Purchase a replacement pumping and heating set heat exchanger for Stage I (and ultimately Stage II) to be retained in inventory as a critical spare. Search all non-destructive examination techniques available to determine P&H Set heat exchanger life cycle condition.	Risk impact reduced.	2	2	Low
109	If there was poor boiler water quality, component failure throughout the HTGS steam system may occur which may result in the Thermal Operation being shutdown for more than the acceptable maximum downtime	VP NLH	Manager Thermal Generation	Medium					Rigorous control of water chemistry according to EPRI standards and regular tube samples to determine deposit loading will reduce the risk of failure. A scheduled boiler acid wash will also reduce deposit loading and further reduce failure risk.	Likelihood reduction.	1	4	Low
110	If there was poor fuel quality, component failure may occur which may result in a spill or release of Bunker C into the environment, which could lead to regulatory non-compliance with stop work order issued with extended clean-up effort required .	VP NLH	Manager Thermal Generation	Medium					Supplier notified and has adjusted the fuel supplied to prevent the problems experienced in 2013. Engage external expert to determine fuel specification which will result in further reduction in fuel quality related fuel system damage. Shipments are monitored at load port for silicon and aluminium to allow for action to be taken. Review and implement recommendations from consultant's (Hatch) redesign of Tank Farm Drainage System. Additional vigilance on monitoring drainage system for oil deposits prior to releasing water from system into the environment. Re-route steam condensate lines from drainage system. Improve Work Methods and enhance PM program on Fuel Oil Heaters.	Likelihood of the loss reduced	2	4	Medium

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111	If there was poor fuel quality, component failure may occur which may result in a spill or release of Bunker C into the environment, which could lead to a loss in stakeholder trust/commitment that is doubtful whether it can be rebuilt due to public concern of lack of commitment .	VP NLH	Manager Thermal Generation	Medium					Supplier notified and has adjusted the fuel supplied to prevent the problems experienced in 2013. Engage external expert to determine fuel specification which will result in further reduction in fuel quality related fuel system damage. Shipments are monitored at load port for silicon and aluminium to allow for action to be taken. Review and implement recommendations from consultant's (Hatch) redesign of Tank Farm Drainage System. Additional vigilance on monitoring drainage system for oil deposits prior to releasing water from system into the environment. Re-route steam condensate lines from drainage system. Improve Work Methods and enhance PM program on Fuel Oil Heaters.	Likelihood of the loss reduced	2	4	Medium