Q. **Reference: Life Extension Application, Schedule 1, page 7, lines 9-11.**

"Hydro is proposing the next PM9 for Unit 7 in its 2026 Capital Budget Application; the scope of this work will be expanded to include short-term remediation work to address deficiencies identified during the 2023 Condition Assessment as being urgent and unable to delay until 2028."

Provide a list of the deficiencies identified during the 2023 Condition Assessment as being urgent and unable to delay until 2028 and also identify items that are not planned to be included in the PM9 work.

A. In the Life Extension Application,[1] Newfoundland and Labrador Hydro ("Hydro") provided a table which listed all deficiencies identified in the Bay d'Espoir Unit 7 Condition Assessment Condition Report completed by Hatch Ltd.[2] A similar table is provided as PUB-NLH-002, Attachment 1, with an additional column to identify items from the list that are planned to be addressed in the proposed PM9 work in 2026, including Hydro's planned action.

[1] "Life Extension Application – Bay d'Espoir Unit 7," Newfoundland and Labrador Hydro, June 20, 2025, sch. 1, app A.
[2] "Bay D'Espoir Unit 7 Condition Assessment Condition Report," Hatch Ltd., Rev B0, May 3, 2024.

Item No. (Hatch Report Appendix D)	Component/Topic	Status	Deficiency Description	Do-Nothing Consequence	Recommended Actions	Justification	References (Attachment 1)	Hydro Action (Life Extension Scope)	Hydro Action (2026 PM9 Scope)
1	Stator Core	Good	Slightly oval circularity on lower plane. Circularity of the stator core as measured on three planes is reported to be more oval on the plane close to the bottom of the unit, matching the profile of the embedded structures. However, it is still within CEATI tolerances.	Progression of oval circularity can influence.	Adjust circularity during stator rewind.	Necessary for maximum life extension.	Section 3.4.2	Circularity to be adjusted during stator rewind.	N/A
2	Stator Core	Good	Air guide seal bend is recorded to have approximately 30% of the rivets loose which potentially can damage insulation of the bars behind if take off.	Detachments of the rivets can damage the bar insulation behind the insulating band or end up in the airgap.	Rewind the stator armature winding.	Necessary for maximum life extension.	Section 3.4.3	Rewind Stator Armature Winding. Air guide is to be replaced during the stator rewind and rivetted connections are to be replaced with cap screw, or approved alternative.	N/A
3	Stator Core	Good	Slight inwards conical verticality at the top. Verticality of the stator core is reported to be 85% within CEATI tolerances with remaining 15% out of the CEATI tolerance in direction of the bore, suggesting that the core is leaning inwards towards a conical shape.	Progression of oval circularity can influence magnetic pull balance. Increase in vibration and loss efficiency of the generator.	Adjust verticality after core clamping during stator rewind.	Necessary for maximum life extension.	Section 3.4.2	Verticality to be adjusted during stator rewind.	N/A
4	Stator Core	Good	Loose Core	Progression of looseness	Adjust verticality after core clamping during stator rewind.	Necessary for maximum life extension.	Section 3.4.2	Verticality to be adjusted during stator rewind. Core clamping bolts to be tightened, as required.	N/A
5	Stator Frame	Good	Metallic debris in frame and bottom end caps.	Serious in-service failure with damage to equipment and forced outage.	Clean and inspect to prevent accumulation. Perform during next planned outage or available opportunity.	Life extension.	Section 3.4.1	Stator frame to be cleaned and inspected.	**Inspect end-winding caps at the bottom of the unit.**
6	Stator Armature Winding	Poor	Aged stator armature winding, including visual indications of localized high stress. Distributed cracks in the ground wall insulation close to the bar entrance to the cap and close to the lashing point which it is sign of movement and potentially vibration of the end-winding. End-winding caps at the bottom of the unit in slots from 194 to 200 have significant stress of ground wall insulation. It seems that a proper overlap of epoxy resin and cap compound (mixture of the mica powder and resin) was not achieved during installation. Online PD activity shows slot discharges that are not overt on offline tests. This suggests a potential looseness of the winding.	Serious in-service failure with damage to equipment and forced outage.	Rewind the stator armature winding.	An abnormal event (such as overspeed, single-phase trip, switching surge, etc.) striking an aged winding is more likely to drive it to electrical failure.	Section 3.4.3	Rewind stator armature winding.	N/A

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7	Stator Armature Winding	Poor	Significant bubbling of the paint over bars surface belonging to slot 196 in the area where the bar is going into the bottom cap is sign of possible cold joint of the two halves of the same coil being brazed inside the cap.	Serious in-service failure with damage to equipment and forced outage.	Monitor local temperature with thermal strips. See report for details.	Monitoring the development of the hot spot allows remedial action to be planned before an in-service failure happens.	Section 3.4.3	Recommendation Accepted. Area has been inspected annually since 2023 and no noted progression has occurred beyond what was identified in 2019. Another inspection is planned for 2025 and a detailed inspection will be completed during the 2026 PM9.	**Inspect end-winding caps at the bottom of the unit.**
8	Rotor Field Coils	Fair	Missing additional turn tape over several outermost pole coil assembly turns.	Progression of additional turn tape can create turn to turn short.	Reinsulating the rotor field winding.	Presently, risk of mechanical failure in case of overspeed.	Section 3.4.7	Reinsulating the rotor field winding.	N/A
9	Rotor Field Coils	Fair	Flaking pole collars.	Degradation of the collars can short the creepage path to ground fault.	Reinsulating the rotor field winding.	Not urgent, but component is fully degraded and needs replacement.	Section 3.4.7	Reinsulating the rotor field winding.	N/A
10	Rotor Field Coils	Fair	Overall coil insulation completely degraded.	Serious in-service failure with damage to equipment and forced outage.	Reinsulating the rotor field winding.	Not urgent, but component is fully degraded and needs replacement.	Section 3.4.7	Reinsulating the rotor field winding.	N/A
11	Rotor Field Coils	Fair	Voltage pole drop test did not pass.	Turn to turn short creating unbalanced magnetic pull.	Reinsulating the rotor field winding.	Developing of additional turn-to-turn shorts will cause increased vibration.	Section 3.4.7	Reinsulating the rotor field winding.	N/A
12	Rotor	Fair	V block not installed as per OEM drawings.	Update OEM drawing to as-built condition, not u	Verify proper installation method.	n/a	Section 3.4.7	To be checked during unit reassembly. Rotor poles are to be reinstalled as per OEM drawings and procedures following reinsulation.	N/A
13	Pole Connectors	Fair	Broken lock tab on U shape connector of Pole #1.	If detached can end up in airgap.	Repair lock tab and adjust torque.	n/a	Section 3.4.7	This was inspected in 2024 and was found to be a non-issue. Locking tab is not broken, is just slightly "crooked". No risk to operation and will be inspected again during maintenance outages.	N/A
14	Pole Connectors	Fair	Frayed insulation between U shape connectors.		Reinsulate the field winding.	Not urgent, but component is fully degraded and needs replacement.	Section 3.4.7	Reinsulating the rotor field winding.	N/A
15	Pole Bodies	Fair	Rusted pole faces.	Can affect natural interlaminar insulation, so can created short during the transient condition due to tooth ripple effect.	Repair during field winding reinsulation.	Not urgent, but needed for maximum life extension.	Section 3.4.7	To be repaired during field winding reinsulation.	N/A
16	Pole Bodies	Fair	Minor dents and melt of pole laminations.	Due the location of the dent is more cosmetic than necessary functional correction.	Repair during field winding rewind.	Not urgent, but needed for maximum life extension.	Section 3.4.7	To be repaired during field winding reinsulation.	N/A
17	Rotor Field Winding	Poor	Aged and degraded insulation.	In-service failure with damage to equipment and forced outage.	Reinsulate rotor field winding.	Not urgent, but component is fully degraded and needs replacement.	Section 3.4.7	Reinsulating the rotor field winding.	N/A

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18	Runner Seal Clearance	Poor	Runner seal clearance is changing over time. Data tracked from 2006 by NL Hydro shows trending. Voith re-machined the wearing rings in 2019, recorded the as found and as-left condition, and provided analysis for estimated remaining life. Hatch took independent readings in 2023 and found the A2 location on the upper seal is above the "Upper Intervention / Critical" limit according to the Voith 2019 report.	The seal clearances are already near or exceeding the intervention limit recommended by Voith from 2019. More severe out of tolerance issues can cause vibration issues and increase in hydraulic thrust. High thrust load can decrease service life of thrust bearing or thrust bearing failure. Thrust bearing temperatures will provide indication of overloading. Do nothing analysis assumes continued monitoring and yearly measurements as currently performed.	Embedded component machining to ensure bottom ring and head covers have well-established seating surfaces and supply new wearing rings (bushings) on the head cover, bottom ring, and runner.	AAR may continue to pose a risk to embedded components and runner seal clearance. Expected life based on need to replace wearing rings and risk posed by large seal clearance. Costs included in other line items.	Section 3.13.4	Embedded components to be machined, new wearing rings to be installed. Continued vibration monitoring.	N/A
					Continue monitoring vibration and temperature of bearings with yearly runner seal clearance measurements.	Reduce risk of unplanned outages and sudden failure or issues.			
19	Runner Cavitation	Poor	Cavitation damage at several locations on the runner. The runner has been weld repaired several times and the cavitation damage is an ongoing problem.	Cavitation will continue and may cause structural damage to the runner. Cavitation can also cause poor hydraulic performance. If no action is taken, the runner will continue to cavitate. Hatch estimates that if NL Hydro operates the units within the known cavitation limits and performs regular inspections of the runner, the estimated service life is 5-10 years. Voith recommended to replace the runner within 5 years of 2019 report.	Supply a new stainless-steel runner.	A stainless-steel runner can be more cavitation resistant and not require painting like the current carbon steel runner. A new hydraulic profile and design can provide increased efficiency and reduce the likelihood of cavitation. Runner replacement with estimated 2% increase in efficiency is optimal solution according to Hatch Uprate Report (H371822-0000-2A1-066-0002). It is possible to perform cavitation repairs on runners, but this cannot be performed indefinitely. There is risk to weld deformations causing hydraulic tolerance issues and structural issues with layered weld repairs. Hatch does not recommend additional weld repairs beyond the extent currently performed. As NL Hydro does not have blade templates, the likelihood of performing extensive weld repairs within the hydraulic tolerance is very low.	Section 3.13.1	Runner to be replaced. Efficiency testing will be part of the runner replacement work.	**Reweld runner cavitation to ensure reliable operation until runner replaced in 2028.**
					Perform an index test or an absolute efficiency test for a new runner (Dye Dilution Test).	Perform an index test or an absolute efficiency test for a new runner to ensure desired performance.			

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20	Runner Wearing Rings	Fair	Contact damage and minor cavitation. Contact damage believed to be from the 1970's based on inspection photos during that time.	There is little structural risk with the given damages as they are more of a consequence of other issues or events. However, significant cavitation or damage to the rings may cause an imbalanced seal that can lead to pulsing or vibrations. Cavitation damage likely to continue at an exponential rate if seal clearances continue to change.	Replace wearing rings along with new runner. Monitor turbine vibration and annual inspection of runner seal clearances.	Costs included with runner replacement. Reduce risk of unplanned outages and sudden failure or issues.	Section 3.13.2	Wearing rings to be replaced. Continued vibration monitoring and inspection.	N/A
21	Runner Cover Plate	Good	2019 outage found cracking and piece broken off the	There is a low risk of the cover plate failing again.	Replace Runner	Costs included with runner replacement. Risk of lead impact on environment is	Section 3.13.3	Runner to be replaced.	N/A
22	Wicket Gates	Good	Concentricity of trunnions were not verified during rehabilitation in 2019. Surface finish of gates stems above OEM tolerance. Wear and scoring on gate stems. Moderate scratches and dents on the gate leaves.	Out of concentricity tolerance can lead to binding of the wicket gates and pre-mature wear of the gate stem bushings. It can also impact the alignment of the wicket gate vertical seals when in the closed position. Scratches and scoring	Rehabilitate Existing Gates. FEA and Fatigue Life Calculation of existing gates.	Hatch recommends that the base scope of supply to be rehabilitation of the existing gates with the option of new gates. New gates would need to be justified by a manufacturer to prove sufficient performance increase or by an outage schedule savings. Ensure life extension based on cyclical loading of gates.	Section 3.9	Rehabilitation of existing wicket gates. Wicket gates may be replaced if replacement results in improved turbine efficiency - to be determined during runner design. Optional pricing and efficiency gain to be requested.	N/A
23	Turbine Shaft Seal Sleeve	Fair	2019 report by Voith showed wear of the shaft sleeve surface.	This seal surface will continue to wear. Increased wear will increase the leakage around the shaft seal. Too much leakage can cause water damage to other components in the turbine pit.	Replace shaft sleeve on turbine shaft and carbon seal rings. Inspect and rehabilitate the shaft seal housing assembly.	Cost of shaft sleeve included with turbine shaft recommendations. Cost of new carbon seals and rehabilitation shown in this row.	Section 3.7	Shaft sleeve to be replaced. Inspection and rehabilitation of shaft seal housing assembly.	N/A

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24	Turbine Shaft	Fair	There was no dimensional inspection or NDE performed in 2019. There was also no visual assessment of the turbine shaft coupling flange. The risk is associated with the unknown condition of the shaft and flanged connection to the runner. There were light scratches and dents on the turbine guide bearing journal reported in 2019.	If nothing is done, the expected shaft has an estimated remaining life of 10 years. Rough or damaged bearing journal surfaces can impact bearing life and operation. If a new runner is supplied, the shaft would require machining of the spigot and coupling bores to ensure a proper fit-up to the new runner.	Shaft should be taken to a rehabilitation facility, cleaned, NDE inspected, dimensionally inspected, and painted. A new shaft sleeve should be installed as well as new coupling hardware between the shaft and runner. Surface finishes not to OEM specifications should be addressed during the rehabilitation. An FEA and fatigue analysis should be performed in addition to the general rehabilitation and reconditioning of the shaft. To adapt a new runner, the runner end spigot and runner end coupling bores should be re-machined.	Necessary for service life of 25 years or longer. Hatch agrees with Voith's recommendation to rehabilitate the shaft. There is no evidence to justify a new shaft for the turbine. The only situation where a new shaft would be required is if the unit was uprated to a point that the current shaft is not suitable for static stresses, fatigue life, or shaft-line stability.	Section 3.9	Turbine shaft to be cleaned, inspected, rehabilitated, and painted. New shaft sleeve to be installed. FEA and fatigue analysis to be completed. An option to replace the existing oil filled turbine guide bearing with a water lubricated bearing will be investigated. If this option is selected the turbine shaft will need to be modified or replaced.	N/A
25	Generator Shaft	Fair	From visual inspection: Discoloration and scoring on the rotor coupling flange believed to be from the coupling hardware. There was no dimensional inspection or NDE performed in 2019. The risk is associated with the unknown condition of the shaft and flanged connection to the runner.	If nothing is done, the expected shaft has an estimated remaining life of 10 years.	Shaft should be taken to a rehabilitation facility, cleaned, NDE inspected, dimensionally inspected, and painted. Surface finishes not to OEM specifications should be addressed during the rehabilitation. An FEA and fatigue analysis should be performed in addition to the general rehabilitation and reconditioning of the shaft.	Necessary for service life of 25 years or longer. Hatch agrees with Voith's recommendation to rehabilitate the shaft. There is no evidence to justify a new generator shaft. The only situation where a new shaft would be required is if the unit was uprated to a point that the current shaft is not suitable for static stresses, fatigue life, or shaft-line stability.	Section 3.8	Generator shaft to be cleaned, inspected, rehabilitated, and painted. FEA and fatigue analysis to be completed.	N/A
26	Operating Ring and Bearings	Poor	Significant surface damage on the upper and lower operating ring bearing journal surfaces. Operating ring has deformed over time is now an oval shape. Issues with temporary bearing pads installed in 2019.	Bearing pads will continue to come out of place and cause damage to the operating ring and the head cover. Grease from the operating ring bearing is not contained and may contaminate turbine pit equipment. Sever damage may prevent gates from opening.	Inspection and Rehabilitation of Operating Ring and Supply of New Bearing Pads. As an option, a new operating ring with a split should be considered by NL Hydro as the bearing pads can be changed without major disassembly of the unit.	As the current bearing pads have already caused issues, regular maintenance and monitoring is required. Expected service life based on bearing pad life. Operating ring life expected to be 40 years.	Section 3.10.2	Based on the condition of the operating ring and its criticality in control of unit operation, it has been decided to replace the operating ring.	**Installation of temporary operating ring guide pads to ensure reliable operation until operating ring replaced in 2028.**
27	Gate Servomotor Scoring	Fair	NL Hydro believes that there was leaking in the servomotors prior to 2019. Scoring on the ID of the cylinder wall discover in 2019 and not addressed. Scoring on the piston.	Leakage around piston and loss of pressure.	Inspection, rehabilitation, and replace wear components. Recommend to complete work in parallel with operating ring.	Life extension.	Section 3.10.1.1	Inspection and rehabilitation of servomotor components. Replacement of wear components.	**Replacement of servomotor piston seals.**
28	Wicket Gate Link Pins	Fair	Pins dropping out could cause damage to arms and links in addition to losing control of a wicket gate.	Pins dropping out could cause damage to arms and links in addition to losing control of a wicket gate.	Replace link pins.	Expected service life is based on new bushings. New pins expected service life is 50+ years.	Section 3.10.3	Link pin replacement.	N/A

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29	Spiral Case Access Door Leakage	Poor	Water leakage around the spiral case access door.	It's not possible to provide a confident outlook if nothing is done. If the condition has been in existence for 30+ years as reported by NL Hydro, it could continue as is for another 15 or 20 years. Or it could become a more urgent issue if the leakage rate increases rapidly. Exact consequences are unclear as the root cause is not identified. The current leakage rate does not appear to be causing other significant issues. NL Hydro could continue to monitor the flow rate.	Hatch recommends monitoring and collect leakage data. If the average flow rate increases month over month for more than three (3) consecutive months, or if there is a sustained average flow rate over 3.0 L/s over a given month, that NL Hydro investigate the problem further and perform the following recommended repairs.	Reduce risk of unplanned outages and sudden failure or issues.	Section 3.11.4.1	Leaks will be investigated during dismantling of unit and action taken to reduce or eliminate them. Cleaning and coating the embedded parts is part of the life extension work.	**Grouting of scroll case to ensure reliable operation until 2028.**
					Seal weld stay ring flange to discharge ring. This will likely cause distortion of the discharge ring surface where the bottom ring mounts to. Therefore, field machining of embedded components is required. This field machining would be recommended in either situation as to ensure proper alignment of the bottom ring to head cover, ensure level mounting surfaces, and ensure the bottom ring flange with the Oring has a proper mounting surface to seal.	This will resolve the most likely source of the water source. Not guaranteed to prevent all water leakage around spiral case access door.			
					Lead abate, blast, clean, NDE, and paint the spiral case, stay ring, stay vanes, discharge ring, and draft tube liner down to the maintenance platform. Perform local repairs as necessary.	Improve water passage surfaces and provide life extension to the embedded components. May reduce leakage if holes are present.			
					Remove spiral case baffle plate, inspect, repair as needed, and re-install baffle plate.	Less likely source of leakage but may improve leakage around access door.			
					Pressure tests all embedded piping.	Ensure embedded piping doesn't have leaks. Likely not the main source of the access door leakage, but may be a contributing factor if an embedded component has leakage.			
30	Relief Valve Leakage	Poor	Water leakage round the Relief Valve discharge piping and concrete. Water filling up the diffuser and valve when dewatered.	As the condition inside the pipe is unknown, it's difficult to provide a proper assessment.	Borescopic examination of outlet pipe and diffuser, valve rehabilitation, unknown repairs based on inspections.	Life extension of the relief valve.	Section 3.11.4.2	Borescopic examination of outlet pipe and diffuser, valve rehabilitation, repairs based on inspections. Overhaul of outlet gate. Overhauling outlet gate is not part of	N/A
					Overhaul of outlet gate.	Life extension and prevent leakage into valve when dewatering.			
31	Head Cover and Bottom Ring Gate Stem Bores	Fair	Gate stem bore alignment.	Gate stem bore wear, binding of wicket gates, and higher loading of operating mechanism.	The head cover and bottom ring gate stem bores should be either line bored or machined using matching templates.	Ensure proper alignment of the gate stem bores between the components and save on the outage schedule as to not have to line bore in the field.	Section 3.12.3	Boring and/or machining of gate stem bores.	N/A

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32	Head Cover and Bottom Ring Facing Plates and Gate End Seals	Fair	Facing plates are scratched and scored. Damage to rubber gate end seals.	Wicket gate end clearances would require continued monitoring to ensure no further damage is done to the facing plates. Gate end seals expected life is 5 years.	Replace gate end seals and facing plates.	Expected service life of new facing plates is 40+ years. Expected service life of new gate end seals is 15 years.	Section 3.12.4	Replacement of gate end seals and facing plates.	N/A
33	Head Cover	Poor	Wearing ring cavitation, scoring, scratches, and deformed shape. Cracks in stiffeners connecting to the outer flange of the head cover. Upper gate stem bushing damage. Debris from runner found in head cover with possible unknown damage.	Wearing ring damage, crack propagation, and wicket gate bushing issues (i.e. binding).	Rehabilitate existing head cover. Clean, blast, NDE, repair indications, dimensional inspection, machining of wearing ring mounting surface, water passage surface, mounting flanges, installation of new wearing ring, installation of new facing plate (or weld overlay), supply of new hardware, and paint. Gate stem bores should be line bored with bottom ring or bored with a template. Supply and install new gate stem bushings.	An assessment of the schedule and outage cost should be analyzed by NL Hydro to determine if a new head cover is justified. The head cover rehabilitation would be on or near the critical path. Any unforeseen issues or delays could cause an extended outage. Expected service life of rehabilitated head cover is 25-40 years. Expected service life of a new head cover is 50+ years.	Section 3.12.2	Rehabilitation of head cover. Cleaning. Option to replace head cover will be obtained . Replacement may ensure schedule can be achieved.	N/A
34	Bottom Ring	Poor	Cavitation damage under wearing ring. Out of tolerance water passage surface levelness.	Runner seal clearance issues and wearing damage. Wicket gate bushing issues and potential binding.	Replace	Hatch believes that the bottom ring would be able to be rehabilitated but agrees with Voith's 2019 assessment that the schedule risk may be too significant. The bottom ring is the last component out of the unit for rehabilitation and the first component needed back at site. It's also a relatively simple component that can be supplied as a forged ring or fabricated from plate steel.	Section 3.12.1	Replacement of bottom ring.	N/A
35	Thrust Collar, Keys, and Runner	Good	Thrust collar has light fretting and corrosion. Light scoring on the journal surface possibly from contact with guide bearing pads or debris. Mating surface of thrust runner to thrust collar had light signs of fretting and corrosion. Thrust keys have light fretting and corrosion.	These components being reported in good condition could remain as is for another 25+ years if the dimensional and geometric tolerances are within OEM design.	Dimensional inspection and surface finish measurements of running surfaces. Clean, machine, and polish surfaces in a rehabilitation facility to correct any dimensional, geometric, and surface finish out of tolerance issues.	Life extension of thrust collar and thrust runner.	Section 3.5.1.1	Inspection, measurement, and cleaning of running surfaces.	N/A

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36	Combined Thrust and Guide Bearing Pads	Good	Light scoring and Babbitt surface indications.	This surface is a critical surface. Given the current condition, it may be acceptable without intervention for another 5-10 years. Thrust bearing failure can be catastrophic. There is also a risk to wiping the bearing and damaging the thrust runner.	NDE inspection of the bearing pads, re-babbitt, and supply new thrust bed springs.	This will also help mitigate vibration issues by restoring the bearings and journal surfaces back to OEM condition	Section 3.5.1.2	NDE inspection of the bearing pads, re-babbitt, and supply of new thrust bed springs. Additional spare thrust bearing pads to be procured as a full set is not presently held in storage.	N/A
37	Wicket Gate Squeeze	Fair	Wicket gate squeeze is currently 0.5 inch. OEM design gate squeeze is 0.375 inch.	If nothing is done, the bearing pad failures on the operating ring are likely to continue. However, the recommendations for the operating ring bearings, the gate stem bore alignment and the gate servomotors are more critical to the long-term life extension of the turbine. Increased squeeze could cause the bearing pad screws to shear, oval the operating ring, and damage journal surfaces.	Adjust servomotor and wicket gate setting to re-establish OEM squeeze. Install upthrust clips where the OEM lip seal was.	Life extension of gate operating mechanism.	Section 3.10.4	Adjustment of servomotor and gate settings.	N/A
38	Generator and Turbine Cooling Water Strainer Pressure	Poor	Maintenance record Check sheets show consistently low water pressure in the strainer from 2020 to 2022.	Can impact cooling performance for the generator and bearings. Overheating of bearings can cause damage to the operating unit and force and outage to rebabbitt the bearings. Generator overheating can cause damage to insulation and other generator equipment.	Monitor generator and bearing temperatures. Replace strainer at end of service life.	Life extension.	Section 3.19.1	Not in scope of life extension. Routine maintenance and monitoring will continue as part of normal operation.	N/A
39	Wicket Gate Closing Time	Poor	Maintenance record Check sheets show consistently slow closing time for wicket gates.	Unit may not respond as quickly to changes. No likely damage to equipment.	Monitor closing times and servomotor pressures. Issue can be corrected with gate servomotor rehabilitation and operating ring overhaul.	Monitoring can prevent unplanned outages.	Section 3.19.2	Unit will be commissioned as part of this work, closing times and operating pressures will be adjusted and recorded to form the basis of maintenance check sheets going forward.	N/A
N/A- Hydro Proposed	Governor Control System	Fair	Workforce knowledge of this legacy governor is dwindling over time. In addition, system response testing has determined that this governor is not able to provide a faster response as-is.	Risk to operation and reliability in future.	Upgrade the governor to a digital head that can utilize the existing HPU, oil system, and gate servomotors.	Improves operation.	Section 3.15	Modernize the existing mechanical governor to a digitally controlled governor.	N/A
N/A- Hydro Proposed	Excitation Control System	Obsolete	ABB Unitrol F Excitation controls are obsolete. This was noted in the Hatch report.	Support and spares are limited, risk of unnecessary downtime.	Upgrade excitation controls to ABB Unitrol 6000 platform to match what has been completed for Units 1-6.	Obsolesce and risk to reliability.	Section 3.16.2	Upgrade excitation controls.	N/A

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N/A- Hydro Proposed	Turbine Guide Bearing	Fair	Eliminate the use of oil in the bearing by replacing the existing bearing with a water lubricated bearing. This reduces the amount of oil used in the equipment and reduces the risk of a spill.	No effect on the operation.	Obtain a proposal for replacement of the bearing.	Reduce environmental risk.	N/A	Through detailed engineering assess the technical viability, lifecycle cost and reliability impacts of the water lubricated bearing. Installation will be dependent on the outcome of this analysis.	N/A
N/A- Hydro Proposed	Dust Collection System	Not Currently Installed	Carbon brush wear from collector assembly during normal operation results in contamination to stator and rotor windings. To prevent contamination, a specifically designed dust collection system can be provided that removes the carbon from the area via vacuum process.	New stator and rotor windings are subject to more contamination and require more frequent cleaning to ensure reliable operation.	Procure dust collection system for installation during outage.	Prevent contamination to ensure reliable operation and to reduce the need for partial disassembly to clean and remove contamination.	N/A	Install dust collection system.	N/A
N/A- Hydro Proposed	Turbine Pit Monorail and Hoist	Not Currently Installed	Conducting maintenance in the turbine pit with the rotor installed is difficult and introduces potential safety hazards.	Continue to perform limited maintenance with the rotor installed, using temporary lifting devices. This may result in costly and time consuming disassembly if work cannot be completed with the rotor in place.	Design and install a turbine pit monorail and hoist to facilitate more efficient and safer maintenance operation in the turbine pit.	Maintenance efficiency and safety improvements.	N/A	Design and install turbine pit monorail and hoist.	N/A
N/A- Hydro Proposed	Unit Control System	Obsolete	Hardwired controls are original and are obsolete.	Components will continue to age and obsolescence has potential to result in unplanned downtime.	Modernize control system to integrate with all other control systems and unit protection. Allow integration with existing asset monitoring systems and the potential BDE Unit 8 system.	Maintain reliability.	N/A	Modernize unit control system at the same time as major electro-mechanical work, governor and exciter upgrades to minimize future outage time and recommissioning activities.	N/A