August 19, 2025

BP-CORR-00531-06659

Ms. Candace Salmon
Commission Registrar
Canadian Nuclear Safety Commission
P.O. Box 1046
280 Slater Street
Ottawa, Ontario
K1P 5S9

Dear Ms. Salmon:

Bruce A and B:
Request Commission Approval of Change to Reactor Power Limits, Project 2030

The purpose of this letter is to provide notification and request Commission approval of a change in the reactor, channel, and bundle power limits at Bruce A and Bruce B Nuclear Generating Stations, pursuant to the Power Reactor Operating Licence PROL 18.04/2028, Licence Condition 3.1, and the Licence Conditions Handbook LCH-PR-18.04/ 2028-R005, Sections G.1 and G.2. As indicated in the LCH, the power limits outlined in Section 3.1 are safety and control measures. As such, changes to the limits require prior written approval from the Commission, per Sections G.1 and G.2.

Project 2030 is an initiative to support Ontario's climate change goals and future clean energy needs by targeting a site capability of 7,000 megawatts (MW) by the early 2030s. To fulfill these goals, Bruce Power entered into a protocol (Reference 1) with the CNSC for Project 2030 in June 2023, outlining the regulatory submissions, meetings, and interfaces required to support the requested changes to the power limits in Section 3.1 of the LCH and enable the recovery of reactor power up to 100% Full Power (FP).

In January 2024, Bruce Power clarified its proposal to recover the reactor, channel and bundle power limits (Reference 2), proposing a two-step process to demonstrate safety margins to operate up to 100%FP. In Step 1, Bruce Power has demonstrated that safety margins are effectively maintained for operation of the reactor units up to intermediate power levels (IPLs) (95.5%FP and 96%FP at Bruce A and Bruce B respectively). In Step 2, Bruce Power will demonstrate safety margins required to operate the Bruce A and B units up to 100%FP, at a future date.

Bruce Power is requesting Commission approval to increase the reactor, channel, and bundle power limits at Bruce A and Bruce B as part of the Step 1 implementation of Project 2030, as shown in the following table:

Maury Burton, Senior Director, Regulatory Affairs
177 Tie Rd, Tiverton ON N0G 2T0
Telephone 519-386-2394
maury.burton@brucepower.com

Bruce A		
	Inner Flow Zone	**Outer Flow Zone**
Total power generated in any one fuel bundle	Shall not exceed 1000 kilowatts under normal steady-state operating conditions	Shall not exceed 885 kilowatts under normal steady-state operating conditions
Total power generated in any one fuel channel	Shall not exceed 7.060 megawatts under normal steady-state operating conditions	Shall not exceed 6.450 megawatts under normal steady-state operating conditions
Total thermal power from the reactor fuel	Shall not exceed 2705 megawatts (95.5% full power) under normal steady-state operating conditions	
Bruce B		
	Inner Flow Zone	**Outer Flow Zone**
Total power generated in any one fuel bundle	Shall not exceed 864 kilowatts under normal steady-state operating conditions	
Total power generated in any one fuel channel	Shall not exceed 6.912 megawatts under normal steady-state operating conditions	Shall not exceed 6.432 megawatts under normal steady-state operating conditions
Total thermal power from the reactor fuel	Shall not exceed 2719 megawatts (96% full power) under normal steady-state operating conditions	

Attachment A provides an overview of Project 2030, summarizes impacts on each Safety and Control Area (SCA), and describes how governance within the licensing basis will implement these changes, if approved. The attachment is supported by documentation describing the impacts and required updates to SCA 9, Environmental Protection (Reference 3). Additional documentation is also provided on the updates to SCA 4, Safety Analysis, which are described in the Bruce A and B Integrated Safety Analysis Summary Reports (References 4 and 5). These documents will be submitted to the Commission separately.

As noted in Reference 6, Bruce Power is respectfully requesting approval by July 31, 2026, and a hearing date consistent with the Protocol in the Appendix C schedule that has been endorsed by the CNSC and Bruce Power signatories (Reference 1). Should approval be granted, Bruce Power plans to increase power up to the IPLs in the refurbished units, starting with Unit 6, following the planned 2027 outage (B2761).

If you require further information or have any questions regarding this submission, please contact Ms. Heather Kleb, Isotopes and Business Development, at (519)386-1671, or Heather.Kleb@brucepower.com.

Yours truly,

Digitally signed by
Maury Burton
Date: 2025.08.19
12:42:13 -04'00'

Maury Burton
Senior Director, Regulatory Affairs
Bruce Power

cc: CNSC Forms / Formulaires
Ms. Anupama Bulkan, CNSC - Ottawa
Dr. Alexandre Viktorov, CNSC - Ottawa

Attach.

References:

1. Letter, M. Burton to M. Hornof, “Bruce A and B: Bruce Power Protocol with the Canadian Nuclear Safety Commission for Project 2030”, June 19, 2023, BP-CORR-00531-04237.
2. Letter, M. Burton to K. Lun, “Bruce A and Bruce B: Strategy for Commission Interactions for Project 2030”, January 19, 2024, BP-CORR-00531-04929.
3. Letter, M. Burton to A. Bulkan, “Bruce A and B: Safety Control Area #9 Environmental Protection Gap Analysis, Project 2030”, December 19, 2024, BP-CORR-00531-05980.
4. Letter, M. Burton to A. Bulkan, “Bruce A: Integrated Safety Analysis Summary Report for the Intermediate Power Level, Project 2030”, January 30, 2025, BP-CORR-00531-05701.
5. Letter, M. Burton to A. Bulkan, “Bruce B: Integrated Safety Analysis Summary Report for the Intermediate Power Level, Project 2030”, August 2025, BP-CORR-00531-06202.
6. Letter, M. Burton to C. Salmon, “Bruce A and B: Notice of Intent to Seek Commission Approval”, April 24, 2025, BP-CORR-00531-06431.

Attachment A

Supporting Information for Power Recovery to Intermediate Power Levels

Attachment A:
Supporting Information for Power Recovery to Intermediate Power Levels

EXECUTIVE SUMMARY

This document serves as Bruce Power's formal notification to the Canadian Nuclear Safety Commission (CNSC), pursuant to Licence Condition G.2 of the Power Reactor Operating Licence PROL 18.04/2028 and the associated Licence Conditions Handbook (LCH), LCH PR 18.04/2028 R005, of a proposed change to operation. The submission seeks Commission approval pursuant to Licence Condition G.1 to recover the reactor, channel, and bundle power limits at the Bruce A and Bruce B Nuclear Generating Stations (NGS), as part of the staged implementation of Project 2030.

Project 2030 is a strategic initiative supporting Ontario's climate goals and future clean energy needs by targeting a site capability of 7,000 megawatts by the early 2030s. To achieve these objectives, Bruce Power entered into a Protocol with the CNSC that outlines the required regulatory submissions, meetings, and interfaces to support the proposed change in the power limits in Section 3.1 of the LCH, enabling the recovery of reactor power up to 100% full power (FP).

Although the original design bases for Bruce A and B support operation up to 100%FP, current power limits authorize Bruce A to operate up to 92.5%FP and Bruce B to operate up to 93%FP. Through this submission, Bruce Power proposes a two-step process to demonstrate safety margins for recovering reactor power up to 100%FP:

- Step 1: Bruce Power demonstrates the safety margins are effectively maintained for operation of the reactor units up to intermediate power levels (IPLs) (95.5%FP and 96%FP at Bruce A and B respectively).
- Step 2: Bruce Power demonstrates safety margins to operate the Bruce A and B units up to 100%FP, at a future date.

Bruce Power is currently requesting Commission approval to operate up to the IPLs. Any subsequent change toward the recovery of 100%FP, to align operations with those of other Canadian utilities, will be subject to a separate submission.

Project 2030 involves the installation of components that incorporate design and nuclear safety improvements to recover the design, operational, and safety margins. These efforts build on the foundation provided by programs such as the refurbishment of Units 1 and 2, Major Component Replacement (MCR) of Units 3 through 8, the Lifetime Asset Management Plan, and core conversion. While these programs will increase station and site generation capability, their primary purpose is the life extension of the units.

Accordingly, Project 2030 seeks to identify and recommend opportunities to safely maximize unit, station, and site generation capability, and to align station equipment requirements with the province's growing energy demands. These efforts are being pursued in three stages:

- Stage 1 focused on opportunities with strong potential to enhance generation capability, supported by preliminary safety analyses and conceptual engineering. This early work laid the foundation for further development and validation of recovered reactor power limits.
- Stage 2 advanced the opportunities identified in Stage 1, with continued conceptual engineering to address potential operating constraints at intermediate power levels (IPLs). Additional safety analyses were conducted to support Commission approval of these recovered limits.
- Stage 3 finalizes the safety analyses supporting IPL power recovery and transitions into implementation. Opportunities refined through conceptual engineering in Stage 2 are now being executed to realize the intended generation improvements.

Project 2030 is aligned with the programs, procedures, and expectations of all 15 Safety and Control Areas (SCAs) defined in the LCH. This submission highlights the SCAs requiring updates and notifications if the proposed changes to the power limits are approved, as follows:

- SCA 2, Human Performance Management: Simulator and training materials to be revised to reflect the IPLs prior to implementing the changes, through the Systematic Approach to Training (SAT).
- SCA 3, Operating Performance: Safe Operating Envelope updates and operational documentation to be revised to reflect the IPLs prior to implementing the changes. The Operational Safety Requirements and the Operating Policies and Principles are subject to written notifications in accordance with the LCH.
- SCA 4, Safety Analysis: Deterministic and probabilistic analysis and assessments have been completed to confirm the safety margins for operation up to IPLs.
- SCA 5, Physical Design: Numerous design changes will be installed prior to implementing the changes. The projects included in each of the three stages are listed in Sections 2.1.1, 2.1.2, and 2.1.3 below, and are being managed through the Engineering Change Control (ECC) process.
- SCA 9, Environmental Protection: Impacts on emissions and effluent management to be reassessed prior to implementing the changes and will be documented in the Predictive Environmental Risk Assessment (PERA) updates planned for submission in 2027.
- SCA 11, Waste Management: Bruce Power has concluded that there will be negligible increases in radioactive waste (used nuclear fuel) which will be managed in accordance with the current procedures.
- SCA 15, Isotope Production: Updates to cobalt-60 handling and lutetium-177 production procedures to be revised to reflect the IPLs prior to implementing the changes. These documents are subject to written notifications in accordance with the LCH.

Project 2030 updates have been communicated through Bruce Power's Public Information and Disclosure Program, in accordance with Condition G.5 of the Licence Conditions Handbook (LCH). Stakeholder and Indigenous engagement are ongoing, with regular updates provided since the project's announcement in 2021. Targeted outreach has been extended to the Saugeen Ojibway Nation, Historic Saugeen Métis, and the Métis Nation of Ontario (Region 7). Technical documentation and environmental analyses have been shared in response to specific requests.

Bruce Power confirms that the proposed changes in reactor power limits are within the existing reactor design bases, supported by comprehensive safety analyses and aligned with the CNSC's regulatory framework and LCH compliance requirements, including new methodologies and physical design improvements for nuclear safety per SCA 4, Safety Analysis, and SCA 5, Physical Design. The approval of the proposal outlined in this notification will enable Bruce Power to proceed with operations up to IPLs in accordance with established oversight, safety, and environmental protocols. LCH program and procedural documentation will be employed to ensure continuing compliance with Bruce Power's Power Reactor Operating Licence, PROL 18.04/2028.

1.0 INTRODUCTION

This document provides supporting information for the notification and request for Canadian Nuclear Safety Commission (CNSC) approval pursuant to the Power Reactor Operating Licence, PROL 18.04/2028 Licence Conditions G.1 and G.2, and the associated Licence Conditions Handbook (LCH), Sections G.1 and G.2.

Bruce Power is seeking Commission approval to recover the reactor, channel and bundle power limits at Bruce A and Bruce B, as outlined in the Bruce Power Protocol with the CNSC for Project 2030 (Reference A1) and further detailed in Reference **Error! Reference source not found.**. Project 2030 follows a two-step process to demonstrate safety margins for operating up to 100%FP. Although the reactor design bases for Bruce A and B were originally developed for 100%FP operation, the current licence authorizes Bruce A to operate up to 92.5%FP and Bruce B to operate up to 93%FP.

As a first step toward recovering power levels consistent with the design and licensing bases—and aligning operations with other Canadian utilities—Bruce Power has demonstrated that its reactor units can safely operate at intermediate power levels (IPLs) of 95.5%FP at Bruce A and 96%FP at Bruce B. The safety margins are effectively maintained at these levels. Bruce Power acknowledges that additional work is required before the power limits can be approved for operation up to 100%FP, as outlined in Reference **Error! Reference source not found.**.

The following information is provided in this document:

- a description of significant changes from the licensed activities at the Bruce A and B Nuclear Generating Stations (NGS) (Section 2.0); and
- a discussion of the programs and procedures that manage the licensed activities to be conducted at the NGS and any impacts to them (Section 3.0).

2.0 BACKGROUND

2.1 Licensing Basis (G.1)

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

(i) the regulatory requirements set out in the applicable laws and regulations;

(ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence;

(iii) the safety and control measures described in the licence application and the documents needed to support that licence application;

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (CNSC, hereinafter "the Commission").

As stated, this document provides supporting information for the request for Commission approval pursuant to the PROL 18.04/2028 Condition G.1, and LC 3.1.

Bruce Power's mission statement for Project 2030 is to identify, recommend, and implement safe and cost-effective power recovery opportunities to achieve 7,000MW from the Bruce Power site by the early 2030s. Bruce Power plans to achieve this by recovering power from its post-Major Component Replacement (MCR) units, beginning with Unit 6 in 2027. Project 2030, which involves the installation of components that incorporate design and nuclear safety improvements to recover the design, operating and safety margins, is enabled by programs such as the refurbishment of Units 1 and 2, MCR of Units 3 through 8, the Lifetime Asset Management Plan (LAMP) and core conversion.

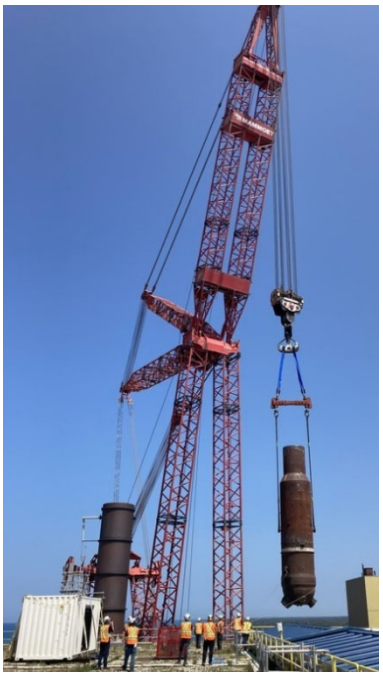

Figure 1: Steam Generator Replacement

The refurbishment of Bruce A Units 1 and 2, along with the MCR of Units 3 and 4, has enhanced the design, operating and safety margins, enabling operation of the reactor units up to 95.5%FP (Reference A3). Key components replaced include pressure tubes and steam generators. Units 1 and 2 underwent these replacements during refurbishments completed in 2012. The modified 37 element fuel bundle (37M) has been implemented at Bruce A, providing improved thermal-hydraulic performance, particularly in Critical Channel Power (CCP).

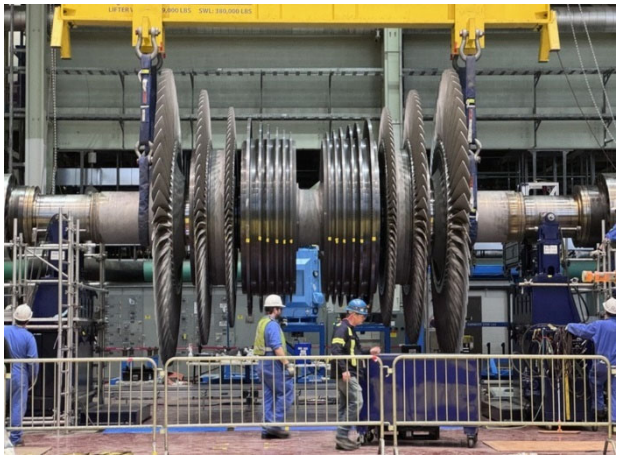

Figure 2: Turbine Replacements and Improvements

Similarly, the MCR of Bruce B Unit 6—and eventually 5 through 8—has improved design, operating, and safety margins, supporting operation up to 96%FP (Reference A4). The MCR program for Units 5 through 8 includes the replacement of pressure tubes, feeders, and steam generators. Bruce B units have adopted the 37M fuel bundle, contributing to improved thermal-hydraulic performance.

Station and site generation capability will continue to increase as MCR and LAMP program scopes are implemented; the successful completion of these programs alone cannot ensure that unit, station, and site generation capability are fully maximized. The primary purpose of these programs is to extend the life of the generating units.

The purpose of Project 2030 is to:

i) Identify and recommend opportunities to safely maximize unit, station and site generation capability; and

ii) Align station equipment needs with the province's need for additional output, given the reactor refurbishments underway at Bruce Power and Ontario Power Generation.

These opportunities and objectives are being pursued in three stages:

- Stage 1 focused on opportunities with a high degree of confidence in improving generation capability. During this phase, conceptual engineering was undertaken to support opportunities requiring further development and to conduct the safety analyses required to confirm the proposed recovery of reactor power limits.

- Stage 2 advanced capability improvement opportunities for which conceptual engineering was completed in Stage 1 and continued to refine them. This stage involved investigating ways to mitigate or eliminate potential limitations associated with operating at intermediate power levels (IPLs), while conducting additional safety analyses to support the Commission's approval.
- Stage 3 finalizes the safety analyses necessary for Commission approval of recovered IPL power limits. It marks the implementation of the opportunities developed through conceptual engineering in Stage 2.

2.1.1 Stage 1

Stage 1 project scopes that involve notable physical and process changes—whether completed, in progress, or planned—are listed in the table below. High-level summaries of these projects are provided in the Bruce A and B Normal Operations Reports (References A3 and A4).

Projects	Status
Bruce B High Pressure Feedwater Heat Exchanger Bypass	completed in 2024
Bruce A Unit 1 Generator Rotor - Stator Rewind	completed in 2021
Bruce A Unit 1 and 2 Main Output Transformer Replacement	completed in 2022
Bruce A Unit 1 and 2 Isolated Phase Bus Cooling Upgrades	completed in 2022
Bruce A Seal Oil System Performance Improvements	completed in 2022
Bruce A Current Transformers and High Voltage Bushings Replacement	planned for 2025-2027
Bruce A Preheater ID Cleaning	completed in 2022
Bruce A/Bruce B, Data Reconciliation/Measurement Uncertainty Recapture Implementation	completed in 2024

2.1.2 Stage 2

Stage 2 project scopes that involve notable physical and process changes—whether completed, in progress, or planned—are listed in the table below. High-level summaries of these projects are provided in References A3 and A4.

Projects	Status
Bruce A/Bruce B Moderator System Improvements	in progress, 2025+
Bruce A Unit 1 and 2 High Pressure Turbines Replacement (planned for 2028+)	planned for 2028+
Bruce A/Bruce B Condenser Tube Cleaning System Upgrades	planned for 2026+
Bruce A Unit 1 Ultrasonic Measurement for Heat Transport System Pump Flows	completed in 2024
Bruce A/Bruce B Safety System Test Frequency Optimization	program implementation completed in 2023; continuous

Projects	Status
	improvements ongoing
Bruce A/Bruce B 36 Month Outage Interval	in progress
Bruce A Hybrid Rod Based Guaranteed Shutdown State	in progress
Bruce A Unit 1 and 2 Condenser Cooling Water Pumps	completed Unit 2 in 2022, Unit 1 in 2024
Bruce A Unit 1 Power Discrepancy Resolution	completed in 2021
Bruce A/Bruce B Hydrogen Production via Excess Electrical Generation Capability Utilization	conceptual designs planned for 2025+
Bruce A/Bruce B Safety Analysis Integrated System Performance Assessment to Support Operation at up to 100% Reactor Power	planned for 2025
Bruce A/Bruce B Conceptual Engineering to Determine Maximum Flow Away from Bruce Complex	completed in 2024
Bruce A Moderator Heat Exchanger Replacement	planned for 2027+
Bruce A/Bruce B Circulating Water System Improvements	planned for 2027+
Bruce A/Bruce B Condenser System Improvements	planned for 2030+

2.1.3 Stage 3

Stage 3 scope is currently being evaluated as assessments, calculations, or operational limitations, based on the expectation that conceptual engineering is not required to determine how the specific components or systems affect operation at intermediate power levels (IPLs). The following project scopes—classified under Bruce A and B Systems Limitations—represent some of the systems under analysis for potential constraints and opportunities for improvement.

Projects	Status
Bruce A/Bruce B Main Generator System Improvements	planned for 2030+
Bruce A/Bruce B Turbine Extraction Steam System Improvements	in progress
Bruce A/Bruce B Main Boiler Feedwater System Improvements	in progress
Bruce A Steam Reject System Improvements	In progress
Bruce A/Bruce B Fuel Handling and Management Systems Improvements	in progress
Bruce A/Bruce B Feed and Bleed – Pressurizer Control Software Tuning	in progress
Bruce B Main Steam Supply System Improvements	in progress
Bruce A/Bruce B Condensate System Improvements	in progress
Bruce A Low Pressure Turbine Improvements	in progress

Projects	Status
Bruce A Neutron Overpower Protection (NOP) Detector Relocation	in progress
Bruce A/Bruce B Irradiated Fuel Port (IFP) Modification	in progress
Bruce B Large Break LOCA Shutdown System 1 Time Constant Modification	in progress
Bruce A/Bruce B Transition Break LOCA Shutdown System Modifications for Higher Reactor Power Operation	in progress

2.2 Notification of Changes (G.2)

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

As stated, this document provides supporting information for the request for approval made to the CNSC pursuant to the PROL 18.04/2028 Condition G.2, and the associated Licence Conditions Handbook, Section G.2.

2.3 Land Use and Occupation (G.3)

The licensee shall control the use and occupation of any land within the exclusion zone.

Project 2030 leverages projects and licensed activities that are being executed through MCR, LAMP and other ongoing improvement initiatives. The CNSC will therefore be independently notified of any associated changes to land use within the exclusion zone through the correspondence associated with these initiatives. For example, notifications have already been completed for MCR support buildings such as the Bruce B administrative building and Auxiliary Guardhouses at Bruce A and B.

2.4 Office for CNSC Onsite Inspectors (G.4)

The licensee shall provide, at the Bruce site and at no expense to the Commission, suitable office space for employees of the Commission who customarily carry out their functions on the premises of Bruce A and B (onsite Commission staff).

Project 2030 does not result in changes to the location of CNSC Onsite Inspectors.

2.5 Public Information and Disclosure (G.5)

The licensee shall implement and maintain a public information and disclosure program.

Project 2030 does not result in changes to the Public Information and Disclosure Program (PIDP). The PIDP is, however, used to ensure that both the local and Indigenous communities are informed of Project 2030 related updates.

2.5.1 Stakeholder Engagement

Project 2030 related information and updates have been circulated to members of the public; starting in October 2021 with the announcement of Bruce Power's goal of achieving a site capability of 7,000 MW in support of climate change targets and future clean energy needs.

2.5.2 Indigenous Engagement

Focused engagement with local Indigenous communities began in early 2023, with follow-up meetings and information provided upon request. Meetings were held with the Historic Saugeen Métis in mid- and late January 2025. The Métis Nation of Ontario requested copies of the associated presentations and technical documentation. General information was shared with the Saugeen Ojibway Nation in December 2024 as part of Bruce Power's annual Regulatory Look Ahead package. This was followed in January 2025 by a more detailed Project 2030 information package and a February 2025 discussion.

Enquiries were received in the areas of thermal output, water intake, and the associated impacts on fisheries, including impingement and entrainment. In response, Bruce Power provided the requested documentation and analyses, including:

- The Bruce A and B: Safety Control Area #9 Environmental Protection Gap Analysis (Reference A5)
- The Engineering Evaluation assessing Bruce A and B's compliance with Permits To Take Water (PTTW) and Environmental Compliance Approval temperature differential limits; and
- A briefing note outlining Bruce Power's collaboration with the Electric Power Research Institute (EPRI) on thermal innovations and low-grade energy recovery.

3.0 OPERATIONAL GOVERNANCE

The programs and procedures applied to the operation of the Bruce A and B units, at 92.5%FP and 93%FP respectively, will continue to be applied at IPLs, ensuring that the facilities are operated in accordance with the licence requirements. Compliance with the licence requirements is assured through the application of the programs and procedures that are cited in the LCH. The impacts of Project 2030 on these programs and procedures are discussed in detail below.

The following section reviews the Safety and Control Areas (SCAs) that are defined in the LCH and describes any changes required to support the recovery of reactor power up to IPLs. Where no changes are required, a statement to that effect is provided.

3.1 SCA 1 - Management System

Licence Condition 1.1: Management System

The licensee shall implement and maintain a management system.

All aspects of the Management System described in the LCH (LC 1) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the Management System as a result of the activities that will be conducted under Project 2030. This includes the implementation of the following documents:

Document Title	Document #
Management System Manual	BP-MSM-1
Conduct of Business	BP-PROG-16.01
Supply Chain	BP-PROG-05.01
Compliance Internal Audit	BP-PROG-15.01
Project Management and Construction	BP-PROG-14.01

Organization Structure Change	BP-PROC-00001
Quality Assurance Program	BP-PROG-17.01

Note: BP-PROG-14.01 now includes BP-PROG-14.02, Contractor Management, as discussed in BP-CORR-000531-06291 (Reference A7).

3.2 SCA 2 - Human Performance Management Program

Licence Condition 2.1: Human Performance Program

The licensee shall implement and maintain a human performance program.

All aspects of the Human Performance Management Program described in the LCH (LC 2.1) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the Human Performance Program as a result of the activities that will be conducted under Project 2030. This includes the implementation of the following documents:

Document Title	Document #
Limits to Hours of Work	BP-PROC-00005
Conduct of Business	BP-PROG-16.01
Human Resources Management	BP-PROG-02.01
Fitness for Duty	BP-PROC-00610
Fitness for Duty Considerations for Shift Complement Staff Held Over for More than 13 Hours	GRP-OPS-00055

Licence Condition 2.2: Minimum Shift Complement and Control Room Staffing

The licensee shall implement and maintain the minimum shift complement and control room staffing for Bruce A and B.

There are no impacts to station shift complement or control room staffing as a result of the recovery of reactor power up to 95.5%FP and 96%FP at Bruce A and Bruce B respectively. This includes the implementation of the following document:

Document Title	Document #
Bruce Power Shift Complement and Fitness for Duty Standard for any complement staff exceeding a 12-hour shift	BP-STND-00152

Licence Condition 2.3: Training Programs

The licensee shall implement and maintain training programs for workers.

Bruce Power's workers will continue to comply with Bruce Power's training requirements and standards. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the training programs as a result of the activities that will be conducted under Project 2030. This includes the implementation of the following documents:

Document Title	Document #
Worker Learning and Qualification	BP-PROG-02.02
Systematic Approach to Training Process	BP-PROC-01071

Licence Condition 2.4: Certification Programs

The licensee shall implement and maintain certification programs in accordance with CNSC regulatory document REGDOC-2.2.3, PERSONNEL CERTIFICATION, VOLUME III: CERTIFICATION OF REACTOR FACILITY WORKERS, VERSION 2...

Persons appointed to the following positions require certification:

(i) authorized health physicist;

(ii) authorized nuclear operator;

(iii) control room shift supervisor;

(iv) Unit 0 control room operator; and

(v) shift manager.

Bruce Power workers will continue to comply with Bruce Power's Certification Programs. It is acknowledged that changes will be required to the Training and Certification Program materials in support of the recovery of reactor power up to 95.5%FP and 96%FP at Bruce A and B respectively. In particular, there will be a need to update simulator training and course materials to ensure that Certified staff are aware of the power limit changes (LC 3.1). Readiness and competence of staff prior to implementing the IPL will be managed in accordance with the associated documents and standards from the LCH, including the following:

Document Title	Document #
Bruce Power Shift Operations Role Descriptions and Certification Maintenance Requirements for Licence Related Positions	BP-STND-00153
Certification Training – Development and Administration of Comprehensive Written Oral Examinations for Certification Training Programs	BP-STND-00092
Certification Training Examinations – Standards for Development and Administration of Closed Reference Multiple Choice Questions for Initial General Certification Written Examinations EG1	BP-STND-00038
Certification Testing & Examinations - Development and Administration of Comprehensive Simulator-Based Examinations for INITIAL Certification Training Programs	BP-STND-00093
Certifications Training Examinations - Standards for Initial Certification Comprehensive Simulator-Based Examinations (CTS, DTS, PCTS)	BP-STND-00085

1.1.1 Simulator-Based Training

Changes to simulator processes and standards will be subject to BP-PROC-01081, Engineering Change Control (ECC) (Section 3.5). Where applicable, the ECC process requires the completion of a Training Needs Analysis to determine what updates to training materials are required, in accordance with BP-PROC-01071, Systematic Approach to Training (SAT) Process (LC 2.3).

3.3 SCA 3 – Operating Performance

This overarching G.1 and G.2 notification of changes to the conduct of licensed activities, which documents the required changes to the LCH, will serve as a request for Commission approval of the proposed changes to the power limits. Associated Safe Operating Envelope (SOE) updates will be implemented prior to increasing power to IPLs and will require prior notification to CNSC staff for the documents identified as written notification documents.

Licence Condition 3.1: Operations Program

The licensee shall implement and maintain an operations program, which includes a set of operating limits.

All aspects of the Operating Performance programs and procedures described in the LCH (LC 3) apply to Project 2030. This includes the supporting documents that are listed in LC 3, as follows.

Document Title	Document #
Operating Policies and Principles – Bruce B	BP-OPP-00001
Operating Policies and Principles – Bruce A	BP-OPP-00002
Operating Policies and Principles – Central Maintenance and Laundry Facility	BP-OPP-00003
Conduct of Plant Operations	BP-PROG-12.01
Operational Safety Requirements for Bruce A Fuel and Reactor Physics	NK21-OSR-31000-00001
Operational Safety Requirements for Bruce A Moderator System	NK21-OSR-32000-00001
Bruce A NGS: Operational Safety Requirements for Heat Transport System	NK21-OSR-33000-00001
Operational Safety Requirements for Bruce A End Shield Cooling System	NK21-OSR-34110-00001
Operational Safety Requirements for Bruce A Containment System	NK21-OSR-34200-00001
Operational Safety Requirements for Bruce A Emergency Coolant Injection System	NK21-OSR-34340-00001
Operational Safety Requirements for Bruce A Powerhouse Emergency Venting System	NK21-OSR-34360-00001
Operational Safety Requirements for Bruce A Shutdown and Maintenance Cooling Systems	NK21-OSR-34700-00001

Document Title	Document #
Operational Safety Requirements for Bruce A Annulus Gas System	NK21-OSR-34980-00001
Operational Safety Requirements for Bruce A Fuel Handling	NK21-OSR-35000-00001
Operational Safety Requirements for Bruce A Main Steam Supply System	NK21-OSR-36100-00001
Operational Safety Requirements for Bruce A Confinement	NK21-OSR-38330/21175-00001
Operational Safety Requirements for Bruce A Feedwater and Condensate System	NK21-OSR-43200-00001
Operational Safety Requirements for Bruce A Electrical System	NK21-OSR-53000/55000-00001
Operational Safety Requirements for Bruce A Qualified Power Supply System	NK21-OSR-54400-00001
Operational Safety Requirements for Bruce A Critical Safety Parameter Monitoring	NK21-OSR-60060-00001
Operational Safety Requirements for Bruce A Control and Shutdown Systems	NK21-OSR-63700-00001
Operational Safety Requirements for Bruce A Service Water Systems	NK21-OSR-71310-00001
Operational Safety Requirements for Bruce A Emergency Boiler Cooling System	NK21-OSR-71910-00001
Operational Safety Requirements for Bruce B Fuel and Reactor Physics	NK29-OSR-31000-00001
Operational Safety Requirements for Bruce B Moderator System	NK29-OSR-32000-00001
Operational Safety Requirements for Bruce B Heat Transport System	NK29-OSR-33000-00001
Operational Safety Requirements for Bruce B End Shield Cooling System	NK29-OSR-34110-00001
Operational Safety Requirements for Bruce B Containment System	NK29-OSR-34200-00001
Operational Safety Requirements for Bruce B Emergency Coolant Injection System	NK29-OSR-34340-00001
Operational Safety Requirements for Bruce B Powerhouse Emergency Venting System	NK29-OSR-34360-00001
Operational Safety Requirements for Bruce B Shutdown and Maintenance Cooling Systems	NK29-OSR-34700-00001
Operational Safety Requirements for Bruce B Annulus Gas System	NK29-OSR-34980-00001

Document Title	Document #
Operational Safety Requirements for Bruce B Fuel Handling	NK29-OSR-35000-00001
Operational Safety Requirements for Bruce B Main Steam Supply System	NK29-OSR-36100-00001
Operational Safety Requirements for Bruce B Confinement	NK29-OSR-38330-21190-00001
Condensate System	NK29-OSR-43200-00001
Operational Safety Requirements for Bruce B Electrical System	NK29-OSR-53000/55000-00001
Operational Safety Requirements for Bruce B Emergency Power Supply System	NK29-OSR-54300-00001
Operational Safety Requirements for Bruce B Critical Safety Parameter Monitoring	NK29-OSR-60060-00001
Operational Safety Requirements for Bruce B Control and Shutdown Systems	NK29-OSR-63700-00001
Operational Safety Requirements for Bruce B Service Water Systems	NK29-OSR-71310-00001
Operational Safety Requirements for Bruce B Emergency Water System	NK29-OSR-71380-00001
Bruce Power Safeguards Site Plan 2015	NK37-CORR-00531-02784

Note: Recent changes to the above documents include:

NK21-OSR-33100-00001 was superseded by NK21-OSR-33000-00001 per BP-CORR-00531-05240 (Reference A8).

NK21-OSR-34200-00004 was superseded by NK21-OSR-34200-00001 per BP-PROC-00531-05240 (Reference A8).

NK21-OSR-34340-00003 was superseded by NK21-OSR-34340-00001 per BP-CORR-00531-06213 (Reference A9).

Several of the Operational Safety Requirements documents have been replaced with new documents per BP-CORR-00531-06573 (Reference A10)

Power Limits

Bruce Power's LCH provides a table of limits for bundle, channel and reactor thermal power in LC 3.1 based on safety analysis limits. The current table provides limits for the operation of Bruce A and B up to 92.5%FP and 93%FP respectively. Bruce Power is requesting Commission approval to change the power limits and is specifically proposing that the limits be updated for power recovery and operation up to 95.5%FP and 96%FP at Bruce A and B respectively, based on the safety analysis limits established by Project 2030, and communicated by means of this G.1 and G.2 notification to the CNSC.

The proposed power limits table is provided below.

Bruce A		
	Inner Flow Zone	**Outer Flow Zone**
Total power generated in any one fuel bundle	Shall not exceed 1000 kilowatts under normal steady-state operating conditions	Shall not exceed 885 kilowatts under normal steady-state operating conditions
Total power generated in any one fuel channel	Shall not exceed 7.060 megawatts under normal steady-state operating conditions	Shall not exceed 6.450 megawatts under normal steady-state operating conditions
Total thermal power from the reactor fuel	Shall not exceed 2705 megawatts (95.5% full power) under normal steady-state operating conditions	
Bruce B		
	Inner Flow Zone	**Outer Flow Zone**
Total power generated in any one fuel bundle	Shall not exceed 864 kilowatts under normal steady-state operating conditions	
Total power generated in any one fuel channel	Shall not exceed 6.912 megawatts under normal steady-state operating conditions	Shall not exceed 6.432 megawatts under normal steady-state operating conditions
Total thermal power from the reactor fuel	Shall not exceed 2719 megawatts (96% full power) under normal steady-state operating conditions	

The changes to the power limits will require updates to the Operating Policies and Principles (OP&Ps), Operational Safety Requirements (OSRs) and other documents supporting the SOE (e.g., updates to shutoff rod drop times). The required safety analyses are being carried out to support the Engineering Change Control process, governed by BP-PROG-10.01, Configuration Management.

Licence Condition 3.2: Approval to Restart after a Serious Process Failure

The licensee shall not restart a reactor after a serious process failure without the prior written approval of the Commission, or the prior written consent of a person authorized by the Commission.

This Licence Condition will not be impacted by Project 2030. Bruce Power will continue to use the existing processes to evaluate whether a serious failure occurred, and if required, request Commission approval once the unit is ready to resume safe operation. This includes the processes in the following documents.

Document Title	**Document #**
Operating Policies and Principles – Bruce B	BP-OPP-00001
Operating Policies and Principles – Bruce A	BP-OPP-00002
Station Transient Operations	BP-STND-00222
Operational Decision Making	BP-PROC-01139
Engineering Evaluation	DIV-ENG-00004

Licence Condition 3.3: Reporting Requirements

The licensee shall notify and report in accordance with CNSC regulatory document REGDOC-3.1.1, Reporting Requirements for Nuclear Power Plants.

This Licence Condition will not be impacted by Project 2030, including the following program document. However, the quarterly report on Safety Performance Indicators (a scheduled report sent to the CNSC per REGDOC-3.1.1, Reporting Requirements for Nuclear Power Plants) will need to account for the changes in power limits when calculating the Unit Capability Factor, Unplanned Capability Loss Factor, and Forced Loss Rate as these calculations are based on a reference energy generation value. This change will be implemented for the first reporting period after a Unit has increased to IPL.

Document Title	Document #
Nuclear Regulatory Affairs	BP-PROG-06.01

3.4 SCA 4 - Safety Analysis

The CNSC requires prior written notification of the changes to the Bruce A and B Safety Reports, including those changes that would be made in support of the recovery of reactor power up to IPLs. A systematic review of the safety analyses in Part 3 of the Safety Reports, and Analysis of Record, was used to define and document a comprehensive and detailed safety analysis scope (Reference A11). A review of past regulatory items related to Deterministic Safety Analysis was performed to support the safety analysis scope.

The Bruce A and B Safety Analysis Impact Reports (SAIRs) identify the safety analyses and assessments required to support operation up to 100%FP. Bruce Power is following a two-step process (Reference **Error! Reference source not found.**) for demonstrating safety margins to operate up to 100%FP, as follows.

- Step 1, Bruce Power demonstrates the safety margins are effectively maintained for operation of the reactor units up to intermediate power levels (IPLs) (95.5%FP and 96%FP at Bruce A and B respectively).

- Step 2, Bruce Power demonstrates safety margins to operate the Bruce A and B units up to 100%FP, at a future date.

While the majority of the safety analyses and assessments were performed at 100%FP, demonstrating safety margins for operation up to IPLs, the LBLOCA and Neutron Overpower Protection (NOP) analyses were specifically performed at IPLs, using the same installed NOP trip setpoint (Reference A12).

Licence Condition 4.1: Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

All aspects of the Safety Analysis programs and procedures described in the LCH (LC 4.1) apply to Project 2030. Impacts to the following documents are discussed further below.

Document Title	Document #
Bruce A Safety Report Part 2: Plant Components and Systems	NK21-SR-01320-00002, Part 2
Bruce B Safety Report Part 2: Plant Components and Systems	NK29-SR-01320-00001, Part 2

Document Title	Document #
Bruce A Safety Report Part 3: Safety Analysis	NK21-SR-01320-00003, Part 3
Bruce B Safety Report Part 3: Safety Analysis	NK29-SR-01320-00002, Part 3
Severe Accident Management	BP-PROC-00659

Safety analysis is performed in accordance with CSA N286.7, REGDOC-2.4.1, Deterministic Safety Analysis (DSA), the LCH guidelines and REGDOC-2.4.2, Probabilistic Safety Assessment (PSA) for Nuclear Power Plants, to confirm that regulatory requirements are met, assist in defining the SOE, and verify that special safety systems and safety-related systems can perform their mitigating role for design basis accidents. Bruce Power's DSA and PSA ensure nuclear safety requirements are defined for issues that may impact the station's design basis or safety analysis basis.

The DSA and PSA are updated every five years, with the next DSA to be submitted to the CNSC in 2027 and the next PSA to be submitted to the CNSC in 2029. These revisions will document the work, described in more detail below, which has been performed by P2030.

Deterministic Safety Analysis and Probabilistic Safety Assessment

An impact assessment of the changes to the Bruce A and B power limits was performed through a systematic review of the Bruce A and B Safety Reports, supported by specific assessments to demonstrate that there is no material change in accident analysis results or event progression. The assessment and analyses reports demonstrated the impact of the changes on the Bruce A and B Safety Reports and proposed design improvements, which are being implemented through SCA 5, Physical Design. The results of the DSA and PSA, as summarized in the Bruce A: Integrated Safety Analysis Summary Report for the Intermediate Power Level, Project 2030 (Reference A13) and Bruce B: Integrated Safety Analysis Summary Report for the Intermediate Power Level, Project 2030 (Reference A14), that were provided to the CNSC demonstrate that from the perspective of SCA 4, Safety Analysis, it is safe to raise power and operate at IPLs. The most recent Bruce A and B Integrated Summary Reports will be included among Bruce Power's Commission Member Documents.

3.5 SCA 5 – Physical Design

Licence Condition 5.1: Design Program

The licensee shall implement and maintain a design program.

All aspects of the Physical Design Program, procedures and standards described in the LCH (LC 5) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the Physical Design Program as a result of the activities that will be conducted under Project 2030. There are no anticipated changes to the following Engineering Change Control (ECC) and Configuration Management programs and procedural documents resulting from Project 2030.

Document Title	Document #
Configuration Management	BP-PROG-10.01
Engineering Change Control	BP-PROC-01081

These programs and procedures are applied across all Stages and projects identified as part of Project 2030. A licensing screening form is prepared for Engineering Changes (EC) in accordance with the ECC process. This evaluates the ECs against the licensing basis to determine if any interactions with the CNSC are required prior to implementing the change. These interactions commonly include a notification in accordance with LC G.2 or a specific expectation elsewhere in the LCH, and notifications or permissives in accordance with Bruce Power governance or a REGDOC or CSA standard listed in the LCH.

Recognizing the need to track the recovery of reactor power from 92.5%FP and 93%FP to 95.5%FP and 96%FP at Bruce A and B respectively in a holistic manner, Bruce Power is preparing an overarching EC that integrates the impacts of individual projects. A design change package (DCP) is being prepared to manage power recovery at each of Bruce A and B. DCPs are also prepared during the unit outages supporting unit-by-unit Project 2030 improvements. These DCPs will serve as the master framework for associated, separate (project-specific) sub-engineering changes that have been created under each top-level DCP. Each EC will undergo licensing impact screening and be subjected to an Environmental Impact Workflow (EIW) where applicable.

Licence Condition 5.2: Pressure Boundary Program

The licensee shall implement and maintain a pressure boundary program and have in place a formal agreement with an Authorized Inspection Agency.

All aspects of Bruce Power's Pressure Boundary Program apply to Project 2030. There are no anticipated changes to the following Pressure Boundary programs and Pressure Boundary Quality Assurance Manual including procedural documents resulting from Project 2030.

Document Title	**Document #**
Pressure Boundary Quality Assurance (PBQA) Manual	BP-QMAN-00002
Index to Pressure Boundary Program Elements (CSA N285.0-12 Table N.1)	B-LIST-01900-00001
System and Item Classification	DIV-ENG-00017
Design Registration and Reconciliation	DIV-ENG-00018

Licence Condition 5.3: Equipment and Structure Qualification Program

The licensee shall implement and maintain an equipment and structure qualification program.

All aspects of Bruce Power's Equipment and Structure Qualification Program apply to Project 2030 activities. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the following standard as a result of the activities that will be conducted under Project 2030.

Document Title	**Document #**
Environmental Qualification Program Requirements	BP-STND-00126

3.6 SCA 6 – Fitness for Service

Licence Condition 6.1: Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

All aspects of the Fitness for Service program described in the LCH (LC 6.1) apply to the Project 2030 activities. There is no change from the previous Licence Renewal Application or impact to the Fitness for Service Program as a result of the activities that will be conducted under Project 2030 (Reference A6). This includes the implementation of the following documents:

Document Title	Document #
Plant Maintenance	BP-PROG-11.04
Equipment Reliability	BP-PROG-11.01
CSA N287.7-08 Periodic Inspection Program for Bruce NGS A Concrete Containment Structures and Appurtenances (Excluding Vacuum Building)	NK21-PIP-21100-00001
CSA N287.7-08 Periodic Inspection Program for Bruce NGS A Vacuum Building	NK21-PIP-25100-00001
CSA N287.7-08 Periodic Inspection Program for Bruce NGS B Concrete Containment Structures and Appurtenances (Excluding Vacuum Building)	NK29-PIP-21100-00001
CSA N287.7-08 Periodic Inspection Program for Bruce NGS B Vacuum Building	NK29-PIP-25100-00001
Visual Inspection of Containment Boundary Components	BP-STND-00249
Bruce A Periodic Inspection Plan Units 1, 2, 3 and 4	NK21-PIP-03641.2-00001
Bruce B Periodic Inspection Plan Units 5, 6, 7 and 8	NK29-PIP-03641.2-00001
Bruce Nuclear Generating Station Fuel Channel Periodic Inspection Program	B-PIP-31100-00002
Bruce A NGS N285.5 Periodic Inspection Plan for Unit 0 and Units 1 to 4 Containment Components	NK21-PIP-03642-00001
Bruce B Periodic Inspection Plan for Unit 0 and Units 5 to 8 Containment Components	NK29-PIP-03642-00001
Life Cycle Management Plan for Safety Related Civil Structures	B-LCM-20000-00001
Fuel Channel Life Cycle Management Plan	B-LCM-31100-00001
Steam Generator and Preheater Periodic Inspection Plan	B-PIP-33110-00001
PHT Feeder Piping Periodic Inspection Plan	B-PIP-33126-00001
On-Line Work Management Program	BP-PROG-11.02
Outage Work Management	BP-PROG-11.03
Chemistry Management	BP-PROG-12.02

Document Title	Document #
Evaluation Process of Pressure Tube Fitness-for-Service Using CSA N285.8	B-REP-31100-00010

Note: BP-PROC-00815 was superseded by BP-STND-00249 per BP-CORR-00531-06374 (Reference A15).

There are no significant impacts to the program and procedural documents in the Fitness for Service section (LC 6) of the LCH that would result from Project 2030 and the recovery of reactor power up to IPLs from a Major Component aging perspective. If approved, changes to the power limits will be reflected in future document revisions as needed and will be submitted to CNSC staff in accordance with the associated CSA standard.

As per the LCH, Bruce Power will be required to implement a Periodic Inspection Program which is compliant with CSA N285.7 in 2028. The scope of this program is limited to secondary/balance-of-plant systems and will be updated to include any modifications or changes made to plant equipment under Project 2030.

3.7 SCA 7 – Radiation Protection

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

All aspects of the Radiation Protection Program apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the Radiation Protection Program and associated documents as a result of the activities that will be conducted under Project 2030. This includes the implementation of the following documents:

Document Title	Document #
Radiation Protection Program	BP-PROG-12.05
ALARA Program	BP-RPP-00044
Dosimetry Requirements	BP-PROC-00280
Dose Limits and Exposure Control	BP-RPP-00009

3.8 SCA 8 – Conventional Health and Safety

The licensee shall implement and maintain a conventional health and safety program.

All aspects of the Conventional Health and Safety Program described in the LCH (LC 8.1) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the Health and Safety Management Program resulting from the activities that will be conducted under Project 2030. This includes the implementation of the following document:

Document Title	Document #
Health and Safety Management	BP-PROG-00.06

3.9 SCA 9 – Environmental Protection

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

All aspects of the Environmental Protection Program described in the LCH (LC 9.1) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the Environmental Protection Program resulting from the activities that will be conducted under Project 2030. This includes the implementation of the following documents:

Document Title	Document #
Environmental Management	BP-PROG-00.02
Derived Release Limits and Environmental Action Levels for Bruce Nuclear Generating Station A	NK21-REP-03482-00002
Derived Release Limits and Environmental Action Levels for Bruce Nuclear Generating Station B	NK29-REP-03482-00003
Radiological Emissions & Effluent	BP-STND-00049
Conventional Water Effluent Monitoring	BP-STND-00051
Conventional Air emissions Monitoring	BP-STND-00056

Nuclear Substances - Derived Release Limits (DRLs) and Environmental Action Levels (EALs)

No new radionuclides and no changes to DRLs and EALs are anticipated due to the change in power limits (Reference A5).

Environmental Risk Assessment

Bruce Power prepared an environmental protection gap analysis for the Predictive Environmental Risk Assessment (or PERA) of activities completed and planned for the execution of Project 2030 from 2021 - 2026 (Reference A6). Project 2030 activities that are in the early stages of design or that are beyond these dates will be assessed in the next full update to the ERA and PERA. The gap analysis will feed into the analysis supporting the next iteration of the PERA (scheduled to be submitted in 2027), which will include predictive impacts for the period from 2027 - 2031.

As indicated in Section 3.5, project engineers will continue to capture the design and operational changes with the potential to impact the environment in Environmental Impact Workflows (EIWs), as many Stage 2 projects are conceptual in nature or at the early stages of the engineering design process and the Stage 3 projects may not have selected an option or approach. Project 2030 impacts will continue to be identified and assessed throughout the lifecycle of the projects through the ECC process (Section 3.5), with mitigation measures implemented as required. The ERA is submitted in 5-year intervals which includes the evaluation of environmental effects.

Assessments for potential noise impacts from steam reject system changes, potential changes to chemical management, potential changes to (ion exchange resin) IX usage and detritiation will all be completed prior to submitting the 2027 ERA. Thermal effluent assessments will be refined including recovery of reactor power up to 100%FP as a bounding scenario for the 2027 ERA.

Impingement and Entrainment

Entrainment losses are not expected to increase due to the conservative assumptions used in previous calculations (assumed mortality of all entrained fish eggs and larvae). An entrainment pilot is planned to start in 2025 with the entrainment study to run for a minimum of 12 months, with new methods from what was completed in past years. A comparison of this data against the data obtained in the 2013/2014 entrainment study will be completed and if there is a significant difference, an additional 12 months of sampling will be performed. To date, there has not been a discernable increase, and minimal increases are expected, compared to historical values as the change may be masked by annual variability in lake conditions and outages; impingement data is collected at station pumphouses and is monitored for trends. Condenser Cooling Water (CCW) pumps have been replaced from 2018-2024 as part of normal asset management and have not resulted in increasing trends in impingement.

Bruce Power completed a gap analysis to investigate the population level effects of the high impingement of Gizzard Shad in the winter of 2025 (Reference A16).

Thermal Effluent and Environmental Compliance Approvals (ECAs)

While not specifically required by the LCH, Bruce Power routinely reports the results of the conventional effluent monitoring program to the Ministry of Environment, Conservation, and Parks (MECP) in accordance with regulatory requirements (e.g., Environmental Compliance Approvals, Permit To Take Water (PTTW)). Project 2030 thermal effluent scenarios were included in the 2023 application for an extension to the thermal flexibility for the Bruce A discharge (Reference 0). The thermal flexibility was approved for a 5-year extension out to 2028.

Assessments were completed for the power limit change to 95.5%FP and 96%FP for Bruce A and B respectively, taking into account flow improvements from pump replacements, which demonstrated no challenges with PTTW limits or ECA cooling water effluent temperature limits. Flows and temperatures are routinely monitored and validated to ensure compliance with the PTTW and ECA limits.

For the 2027 ERA, thermal effluent assessments will continue to be refined, including the recovery of reactor power. Bruce A/Bruce B Circulating Water System Improvements projects (see Section 2.1.2) will specifically evaluate improvements to the circulating water systems, including potential mitigation measures.

3.10 SCA 10 – Emergency Management and Fire Protection

Licence Condition 10.1: Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

All aspects of the Emergency Preparedness Program described in the LCH (LC 10.1) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the Emergency Preparedness Program as a result of the activities that will be conducted under Project 2030. This includes the implementation of the following documents:

Document Title	Document #
Bruce Power Nuclear Emergency Response Plan	BP-STND-00001
Radioactive Material Transportation Emergency Response Plan	BP-PLAN-15000
Emergency Management and Fire Protection	BP-PROG-08.01

Document Title	Document #

Note: BP-PLAN-00005 was superseded by BP-PROC-15000 per BP-CORR-00531-06385 (Reference **Error! Reference source not found.**).

Licence Condition 10.2: Fire Protection Program

The licensee shall implement and maintain a fire protection program.

All aspects of the Fire Protection Program described in the LCH (LC 10.2) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the Fire Protection Program as a result of Project 2030. This includes the implementation of the following documents:

Document Title	Document #
Fire Safety Plan	BP-STND-00166
Conventional Emergency Plan	BP-STND-00136

Note: The title of BP-STND-00166 was recently changed per BP-CORR-00531-06305 (Reference **Error! Reference source not found.**).

3.11 SCA 11 - Waste Management

Licence Condition 11.1: Waste Management Program

The licensee shall implement and maintain a waste management program.

All aspects of the Waste Management program described in the LCH (LC 11.1) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the Waste Management program that will result from the activities that will be conducted under Project 2030. This includes the implementation of the following documents:

Document Title	Document #
Nuclear Fuel Management	BP-PROG-12.03
Radiation Protection Program	BP-PROG-12.05

Licence Condition 11.2: Decommissioning and Financial Guarantees

The licensee shall notify the Commission of any changes regarding the obligations of decommissioning and financial guarantees under the Lease Agreement with Ontario Power Generation Inc. as described in 15.1.

All aspects of the decommissioning and financial guarantees described in the LCH apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the decommissioning and financial guarantees that will result from the activities that will be conducted under Project 2030.

The Waste Management Program documents, including the Nuclear Fuel Management Program and Radiation Protection Program documents, are not expected to change as a result of Project 2030. However, there will be increased fuel consumption, a need to stockpile more fuel onsite, and manage larger volumes of used nuclear fuel. This information will be updated through the annual projections that are routinely provided to Ontario Power Generation.

The additional fueling and radioactive waste associated with the recovery of reactor power up to 95.5%FP and 96%FP at Bruce A and B respectively will result in a 3% increase in radioactive waste (used nuclear fuel). Operating at IPLs will shorten the run-time of the units proportionally, causing a negligible impact in the long-term. Project 2030 Initiative impacts to decommissioning and financial guarantees will be communicated to Ontario Power Generation through standing processes.

3.12 SCA 12 – Security

Licence Condition 12.1: Nuclear Security Program

The licensee shall implement and maintain a security program.

All aspects of the Nuclear Security Program described in the LCH (LC 12.1) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the nuclear security program as a result of the activities that will be conducted under Project 2030. This includes the implementation of the following documents:

Document Title	Document #
Nuclear Security	BP-PROG-08.02
Cyber Security	BP-PROC-00784
Site Security Plan	B-REP-08160-00001
Tactical Response Plan	SECRET

3.13 SCA 13 – Safeguards and Non-Proliferation

Licence Condition 13.1: Safeguards Program

The licensee shall implement and maintain a safeguards program.

All aspects of the Safeguards Program described in the LCH (LC 13.1) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the safeguards program as a result of the activities that will be conducted under Project 2030. This includes the implementation of the following documents:

Document Title	Document #
Safeguards Operating Manual (Bruce A) U0 F/H	NK21-OM-35370
Safeguards Operating Manual (Bruce B) U0 F/H	NK29-OM-35370

3.14 SCA 14 – Packaging and Transport

Licence Condition 14.1: Packaging and Transport Program

The licensee shall implement and maintain a packaging and transport program.

All aspects of the Packaging and Transport Program described in the LCH (LC 14.1) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to packaging and transport as a result of the activities that will be conducted under Project 2030. This includes the implementation of the following document:

Document Title	Document #
Radioactive Material Transportation	BP-RPP-00188

3.15 SCA 15 – Nuclear Facility-Specific

All aspects of the Nuclear Facility-Specific information described in the LCH (LC 15) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the following Licence Conditions as a result of the activities that will be carried out under Project 2030.

Licence Condition 15.1: Lease Agreement

The licensee shall inform the Commission in writing of any amendments to the Amended and Restated Lease Agreement between Ontario Power Generation Inc., Bruce Power L.P., OPG-Huron A Inc./OPG-Huron B Inc./OPG-Huron Common Facilities Inc., British Energy PLC, Cameco Corporation, TransCanada Pipelines Limited, BPC Generation Infrastructure Trust and Ontario Municipal Employees Retirement Board dated February 14, 2003.

There will be no impacts to the Lease Agreement as a result of the recovery of reactor power up to IPLs.

Licence Condition 15.2: Integrated Implementation Plan

The licensee shall implement the Integrated Implementation Plan.

There will be no impacts to the Integrated Implementation Plan as a result of the recovery of reactor power up to IPLs.

Licence Condition 15.3: Pressure Tube Fracture Toughness

Removed from LCH.

Licence Condition 15.4: Return-to-Service Plan

The licensee shall implement a return-to-service plan for Major Component Replacement.

There will be no impacts to the MCR Return-to-Service Plan as a result of the recovery of reactor power up to IPLs. It is expected that some units will go straight to 95.5%FP and 96%FP at Bruce A and B respectively as part of the Return-To-Service process.

Licence Condition 15.5: Regulatory Hold Points for Return to Service and Continued Operation

The licensee shall obtain the approval of the Commission, or consent of a person authorized by the Commission, prior to the removal of established regulatory hold points.

There will be no impacts to the MCR regulatory hold points as a result of the recovery of reactor power up to IPLs.

Licence Condition 15.6: Periodic Safety Review

The licensee shall conduct and implement a periodic safety review.

There are no impacts to the Periodic Safety Review as a result of the recovery of reactor power up to IPLs.

Licence Condition 15.7: End of Commercial Operations

The licensee shall inform the Commission of any reactor to be removed from commercial operation at Bruce A and B, and shall provide a plan describing the activities and timeline for transitioning from operations to safe storage.

There will be no impacts to plans to remove Bruce A and B units from commercial operation as a result of the recovery of reactor power up to IPLs.

Licence Condition 15.8: Booster Fuel

The licensee shall store and manage booster fuel assemblies at Bruce A in a manner that ensures their physical security.

There will be no impacts to the storage and management of booster fuel assemblies at Bruce A as a result of the recovery of reactor power up to IPLs.

Licence Condition 15.9: Criticality Program

The licensee shall implement and maintain a nuclear criticality safety program.

All aspects of the Criticality Program described in the LCH (LC 15.9) apply to Project 2030. There is no change from the previous Licence Renewal Application (Reference A6) or impact to the Criticality Program as a result of the activities that will be conducted under Project 2030. This includes the implementation of the following document:

Document Title	Document #
Nuclear Criticality Safety Management	BP-PROC-00324

Licence Condition 15.10: Cobalt-60 and Lutetium-177

The licensee shall implement and maintain a program for the production of the nuclear substances Cobalt-60 and Lutetium-177.

All aspects of the program for the production of the nuclear substances (cobalt-60 and lutetium-177) described in the LCH (LC 15.10) apply to Project 2030. Any impacts to the programs and associated procedural documents resulting from the activities that will be conducted under Project 2030 will be addressed through separate notifications.

Document Title	Document #
Cobalt Handling	BP-PROC-00003

Document Title	Document #
Irradiation Services	BP-PROG-18.01
Management of Lutetium-177 Production	BP-PROC-01120

The recovery of reactor power up to IPLs has the potential to impact the harvest of cobalt-60 and the production of lutetium-177. Any resulting changes will be reflected in BP-PROC-00003, Cobalt Handling and BP-PROC-01120, Management of Lutetium-177 Production respectively, both of which require written notification to the CNSC.

1.1.1 Future Cobalt-60 Harvests and Lutetium-177 Production

As noted in Section 2.1.2 above, the 36 Month Outage Interval project is progressing, including the analysis of the potential impacts of extended irradiation periods (~36-38 months) on adjuster absorber design and safety analysis bases. Any resulting changes to BP-PROC-00003, Cobalt Handling are expected to be administrative in nature and will be addressed through a separate notification to the CNSC.

Bruce Power is confirming the potential impacts of the recovery of reactor power on Isotope Production System operation in Unit 7. The resulting CNSC submissions will include the written notification of any resulting changes to BP-PROC-01120, Management of Lutetium-177 Production, which are anticipated to be administrative in nature. With respect to future IPS installations, in additional units, the ECC process would be applied, the necessary licensing screen would be completed, and any required CNSC staff approvals would be pursued.

Licence Condition 15.11: Class II Nuclear Facility

The licensee shall implement and maintain a program for the operation of the Class II nuclear facility.

There are no changes to the program for the operation of the Class II nuclear facility as a result of the recovery of reactor power up to IPLs.

Licence Condition 15.12: Nuclear Substances and Prescribed Equipment

The licensee shall implement and maintain a program for nuclear substances and prescribed equipment.

This licence condition focuses on the types of nuclear substances and prescribed equipment listed in B-LIST-67874-00001 and B-LIST-67874-00002, which will not be impacted by the recovery of reactor power up to IPLs.

Document Title	Document #
Management of Nuclear Substances and Radiation Generating Equipment	BP-RPP-00043
Hopewell Designs BX-3-Box Calibrator Pre-Use Operational and Safety Interlock Checks	NK21-CMP-67870-00002
Hopewell Designs Inc. Model BX3 Gamma Irradiator Operations & Maintenance Manual (Version 1)	N/A

Document Title	Document #
Hopewell Designs, Inc. Stand-Alone Irradiator Calibrator 3347-R2 User Manual	N/A
Instructions for the Removal/Replacement of Kinectrics KIN-FLS400 Sealed Source Assembly	N/A
Conduct of Radiography	BP-PROC-00036
Radiography Emergency Procedures	BP-PROC-00798
Leak Testing	BP-PROC-00143
Nuclear Substances and Prescribed Equipment List	B-LIST-67874-00001
Security Protected Nuclear Substances and Prescribed Equipment List	B-LIST-67874-00002

4.0 References:

A1. Letter, M. Burton to M. Hornof, “Bruce A and B: Bruce Power Protocol with the Canadian Nuclear Safety Commission for Project 2030”, June 19, 2023, BP-CORR-00531-04237.
A2. Letter, M. Burton to K. Lun, “Bruce A and Bruce B: Strategy for Commission Interactions for Project 2030”, January 19, 2024, BP-CORR-00531-04929.
A3. Letter, M. Burton to A. Bulkan, “Bruce A: Normal Operation Report, Project 2030”, December 2, 2024, BP-CORR-00531-05822.
A4. Letter, M. Burton to A. Bulkan, “Bruce B: Normal Operation Report, Project 2030”, March 21, 2025, BP-CORR-00531-06205.
A5. Letter, M. Burton to A. Bulkan, “Bruce A and B: Safety Control Area #9 Environmental Protection Gap Analysis, Project 2030”, December 19, 2024, BP-CORR-00531-05980.
A6. Letter, M. Burton to M. Leblanc, “Application for the renewal of the Power Reactor Operating Licence”, June 30, 2017, NK21-CORR-00531-13493/NK29-CORR-00531-14085/NK37-CORR-00531-02768.
A7. Email, J. Thompson to A. Bulkan, “Notification of Superseding an LCH Document: Revision 007 of BP-PROG-14.01, Contractor Management”, February 26, 2025, BP-CORR-00531-06291.
A8. Email, J. Thompson to K. Lun, “Notification of Revision to LCH Documents: Bruce A and B Operational Safety Requirements”, March 18, 2024, BP-CORR-00531-05240.
A9. Email, J. Thompson to A. Bulkan, “Notification of a Revision to LCH Documents: Bruce A and Bruce B Operational Safety Requirements”, January 28, 2025, BP-CORR-00531-06213.
A10. Email, J. Thompson to A. Bulkan, “Notification of Revision to LCH Documents: Bruce A and B Operational Safety Requirements”, July 31, 2025, BP-CORR-00531-06573.
A11. Letter, M. Burton to M. Hornof, “Bruce A and B: Safety Analysis Impact Reports and Planned Safety and Control Area 4 Submissions List, Project 2030”, February 13, 2023, BP-CORR-00531-03750.
A12. Letter, M. Burton to A. Bulkan, “Bruce A: Large Break and Transition Break Loss of Coolant Accident Analysis at the Intermediate Power Level, Project 2030”, July 18, 2025, BP-CORR-00531-06718.
A13. Letter, M. Burton to A. Bulkan, “Bruce A: Integrated Safety Analysis Summary Report for the Intermediate Power Level, Project 2030”, July 2025, BP-CORR-00531-05701.
A14. Letter, M. Burton to A. Bulkan, “Bruce B: Integrated Summary Report for P2030 Safety Analysis up to 96% FP”, August 2025, BP-CORR-00531-06202.
A15. Email, J. Thompson to A. Bulkan, “Notification of a Revision to an LCH Document: Revision 000 of BP-STND-00249, Visual Inspection of Containment Boundary Components (superseding BP-PROC-00815)”, March 31, 2025, BP-CORR-00531-06374.
A16. Letter, M. Burton to A. Bulkan, “Bruce A: Environmental Impact of Fish Impingement Event, Action Item 2025-07-36805”, August 1, 2025, BP-CORR-00531-36805.
Gaudreau K, Fietsch C-L, Reid L. Thermal Risk Assessment for Environmental Compliance Approval Application. Tiverton, ON, Canada: Bruce Power; 2023 Report No.: B-REP-07221-30JUN2023.

5.0 GLOSSARY

CCP	Critical Channel Power
CNSC	Canadian Nuclear Safety Commission
DCP	Design Change Package
DPRR	Directorate of Power Reactor Regulation
DRL	Derived Release Limits
DSA	Deterministic Safety Analysis
EAL	Environmental Action Level
ECA	Environmental Compliance Approval
EC	Engineering Change
ECC	Engineering Change Control
EFPH	Effective Full Power Hour
EIW	Environmental Impact Workflow
EPRI	Electric Power Research Institute
ERA	Environmental Risk Assessment
FP	Full Power
IFP	Irradiated Fuel Port
IPL	Intermediate Power Level
IX	Ion Exchange
LAMP	Lifetime Asset Management Plan
LBLOCA	Large Break Loss of Cooling Accident
LC	Licence Condition
LCH	Licence Conditions Handbook
37M	37 element fuel bundle
MCR	Major Component Replacement
MECP	Ministry of the Environment, Conservation and Parks
MW	megawatt
NGS	Nuclear Generating Stations
NOP	Neutron Overpower Protection
OP&Ps	Operating Policies and Principles
OSRs	Operational Safety Requirements
PBQA	Pressure Boundary Quality Assurance
PERA	Predictive Environmental Risk Assessment
PHT	Primary Heat Transport
PROL	Power Reactor Operating Licence
PSA	Probabilistic Safety Assessment
PIDP	Public Information and Disclosure Program
PTTW	Permits to Take Water
SAIR	Safety Analysis Impact Report
SAT	Systematic Approach to Training
SCA	Safety and Control Area
SOE	Safe Operating Envelope
SON	Saugeen Ojibway Nation