ONTARIOPOWER GENERATION

Records File Information:
Send to Records

OPG Proprietary

N-FORM-10958-R009*

Modification Outline

Facility: DND ☒ PND-A ☐ PND-B ☐ IMS ☐ Other: _____		**EC Number:** 88528	**EC Rev. No.:** 000
Project # 16-31555	**ECR #** 5258	**USI/SCI:** 38000	**Unit(s):** 0
Title: 0-38000-MASTER- NEW HEAVY WATER STORAGE FACILITY (PROJECT # 16-31555)			
Temporary Modification (TMOD) ☐	**TCR #** (if known) _____ once TCR# known, enter it into the TMOD EC Ref Docs panel, with type: LIST		
Generic Modification (GMOD) ☐			

Problem Statement: 1700 m3 of D2O storage space is required to facilitate execution of the Darlington Refurbishment Project. This quantity is the expected volume of heavy water resulting from a drain of the Moderator (700 m3) and PHT systems (800 m3) of two operating units, as well as an expected volume of 200 m3 of downgraded D2O for decontamination activities throughout the Refurbishment Project.

Storage capacity of the existing D2O Supply and Inventory (S&I) system (SCI 38110) is limited to roughly 800 m3, which is required for ongoing operation of the Darlington Station, a requirement that will be sustained during refurbishment outages. Based on both usage and capacity needs, the S&I system is ill-equipped to store additional heavy water during the Refurbishment Project.

To ensure timely execution of the Refurbishment Project, the necessary heavy water storage space must be available for service (AFS) 6 months ahead of the earliest outage start date.

Additionally, operation of the current HWMB/TRF threatens OPG's ability to meet detritiation objectives, during and after Refurbishment. Specifically, the HWMB/TRF deficiencies include (N-PCH-09701-10001):

1) Disconnect between TRF demand and availability due to insufficient feed and product storage space.

2) HWMB/TRF design is complex with multiple single point vulnerabilities and lengthy maintenance outages; therefore, availability of the systems is limited resulting in the lack of ability to accept water from external customers (lost revenue).

3) Drum inventory across the nuclear fleet (PNGS and DNGS) retains 3500 drums that require cleaning or disposal.

4) Current non-standard office locations such as the transformer room, waste handling areas, laundry room, trailers, etc reduce efficiency of HWMB/TRF operations.

To correct these deficiencies, OPG has established a need for 600 m3 of additional TRF D2O storage, a drum handling facility capable of testing, cleaning and disposing of 200 L drums, and the modification of office space to ensure sufficient resources for current and future needs for efficient operation and maintenance of the TRF.

Of the 600 m3 and 1700 m3 storage capacities required for the TRF and Refurbishment, respectively, 200 m3 of each volume will be used for storing Downgraded D2O, and can be considered available for both business needs. As a result, a total of 2100 m3 of additional storage space is required.

Proposed Solution (should be in sufficient detail to allow assessment of risk)**:** A review of the design alternatives for the Heavy Water Management Building West Annex has identified recommended options supporting the project charter and preliminary design requirements contained in N-PCH-09701-10001, Refurbishment, Operational Improvements and Long Term D2O Storage and NK38-DR-38000-10001, Preliminary Design Requirements for the Darlington Heavy Water Management Building West Annex. For a full description of the preferred solution refer to NK38-REP-38000-10002, "Conceptual Design Report for the Heavy Water Management Building West Annex".

An attached building is recommended for the West Annex as this will provide maximum flexibility during detailed design, would facilitate storage of all new Heavy Water tank(s) on the 87.000m elevation within a seismically qualified dike, and would best facilitate operations and maintenance based on the improved accessibility. An operational volume of 2100 m3 of Heavy Water storage space should be stored in a combination of 100 m3, 50 m3 and 25 m3 tanks. With the exception of tanks designated for storage of Heavy Water with a tritium concentration less than 2 Ci/kg, all tanks should be classified as Nuclear Class 3. Tanks with tritium concentrations less than 2 Ci/kg should be classified as Nuclear Class 6, as this provides considerable cost savings. The electrical power supply for the West Annex should be fed from the municipality of Clarington through the DN Electrical Distribution Upgrade Project, #10-73821. A backup power source and an uninterruptable power source should also be installed to meet minimum abnormal operating requirements during a loss of municipal power. For high risk interfacing systems connections to existing systems should be installed to support the West Annex for all but the following systems: Effluent Stack and Radioactivity Monitoring (SCI 73690 and SCI 67989), Heating (SCI 73680) for office space only, Ventilation (SCI 73690) and Air Conditioning (SCI 73870). For connections to existing systems, additional major equipment such as pumps, piping, controls, etc is still required, but termination would be provided at the existing system rather than a closed loop independent process.

PART 1. RISK ASSESSMENT

The modification process is based on the risk assessment of the modification. Unless otherwise noted, risk rating tables should be evaluated based upon **BOTH** the risk while doing the modification **AND** the risk during all phases of operations and maintenance. The highest risk level (that is, the lowest number) defined at any point in this cycle is used. Credit may be taken for pre-existing controls (for example, training, procedures) to reduce risk, and if done so, the document number should be referenced with, if necessary, an explanation of how that document controls the issue.

Rate all Part 1 risks and provide justification for each rating.

1.1 **Employee Safety Risk**. Any risk to workers at OPG facilities, both conventional and radiological, (including due to equipment failure).

(A) Initial High Risk Assessment

Any "yes" answer means the Risk Level is "1"	**Evaluation**	
Is any new conventional safety risk (that is, new to that system) being introduced?	Yes ☒ (Risk = 1)	No ☐
Is work being done in a Radiological High Hazard Work (RHHW) environment (refer to N-PROC-RA-0027, Radioactive Work Planning, Execution and Close Out)?	Yes ☐ (Risk = 1)	No ☒

Only if **every** Initial High Risk Assessment question above was answered "**No**" proceed to the Incident Assessment ([B] below) to determine Risk Level.

(B) Incident Assessment

If all answers in (A) were "No", choose the one row in the following table that describes the incident with the highest expected most reasonable potential for harm, and then choose the probability.

The following are probability guidelines only:

- **High:** Employee is exposed to multiple hazards over a wide variety of non-routine tasks.
- **Medium:** Employee is exposed to contact with a single hazard for a wide variety of tasks or to multiple hazards for routine tasks.
- **Low:** Employee is exposed for a single hazard for routine tasks.

	Rating Probability		
Incident	**High**	**Medium**	**Low**
Fatality or permanent disabling injury OR Regulatory Dose Limit Exceeded	1☐	2☒	3☐
Temporary Disability or Lost Time OR Administrative Dose Limit Exceeded	2☐	3☐	4☐
Medical Aid Injury or Minor Disability OR Exposure Control Level exceeded	3☐	4☐	5☐
Not Applicable	N/A☐		

Justification: The new drum handling/testing/cleaning facility will present new risks in the way drums are currently handled. Under normal conditions in the HWMB, according to N-PROC-RA-0027, work is expected to be in a Radioactive Work with whole body dose rate less than 500 mrem/hr, and air borne tritium oxide less than 1000 MPCa.

Most work involves multiple routine construction activities and hazards. For conservatism, a medium risk of fatality or disabling injury is selected because of the scale of the construction project and the use of cranes, shoring, use of excavation equipment, and working at hieghts.

1.2 **Environmental Risk**. Any risk to the environment, both conventional and radiological (including due to equipment failure).

To determine the Risk Level, choose the one row in the table that describes the incident with the highest expected most reasonable potential for environmental harm, and then choose the probability.

The following are probability guidelines only (including incidents due to human error):

- **High:** Incident is expected during routine or ongoing activity, **or** is known to have occurred on a routine basis in the past, **or** impacts associated with the incident are likely to emerge soon, **or** impacts are unknown.
- **Medium:** Incident is expected to occur once or twice a year **or** impacts are likely to occur within 1 year.
- **Low:** Incident is expected to very infrequently, for example once every several years.

Incident	**Probability**		
	High	**Medium**	**Low**
Direct impact to Certificate of Approval or environmental non-compliance (for example, unapproved release, spill of contaminant, unapproved waste, physical change to lands or waterways, contamination release to public areas).	1☐	2☐	3☒
Corporate impact (for example, affects environment policy, performance, ISO 14001 registration, public image, due diligence, contamination in Zone 1).	2☐	3☐	4☐
Eliminating/eroding or not implementing a good industry practice (for example, contamination in Zone 2).	3☐	4☐	5☐
Administrative impact (for example, increased reporting, minor change to existing approval, contamination in Zone 3).	4☐	5☐	5☐
Not Applicable	N/A☐		

Justification:

Environmental concerns:

- The modifications may require a change to the current CofA's for air and water.

- The new chiller unit must comply with Federal Halocarbon Regulations for type of refrigerant, storage and handling.

- The project location is within identifed contaminated land (tritium from IWST spill). Control meaures must be in place to manage the work.

- A waste management plan will be necessary to dispose/discharge of water and soil wastes including dewatering activities

- Protection of water resources for erosion/sediment /silt control during site prep and construction

- Spill prevention measures during site prep and construction including spill containment, refuelling, equipment condition, etc.

-Design should incorporate, spill prevention, best available technology to reduce tritium/air emissions, energy efficiency (lights, water use, etc) as well as consideration for bird friendly design to avoid bird strikes.

1.3 **Nuclear Safety Risk.** Failure of modification could impact our ability to control, cool, and contain the fuel (including due to equipment failure). Includes impact on containment penetrations.

For listing of Special Safety and S-98 systems:

For Pickering A, refer to NA44-REP-03611-00004, Pickering A Systems Important to Safety.

For Pickering B, refer to NK30-INS-03611-00001, Pickering B Reactor Safety Reliability Program.

For Darlington, refer to NK38-CORR-01600-0159261, Recommendation for S-98 System Important to Safety.

For listing of Safety Related systems:

For Pickering, refer to P-PROC-MP-0006, List of Safety Related Systems

For Darlington, refer to NK38-LIST-06937-10001, List of Safety Related Systems and Functions

To determine the Risk Level, choose the one row in the table that describes the system involved in the modification with the highest nuclear safety significance, and then choose the impact.

The following are impact guidelines only:

- **High Impact:** Failure of modified system, structure, or component (SSC) means system or structure is unable to perform its credited safety function.
- **Medium Impact:** Failure of modified SSC means ability of system or structure to perform its credited safety function is degraded.
- **Low Impact:** Failure of modified SSC means redundancy of a system or structure to perform its credited safety function is reduced.
- **Very Low Impact:** Failure of modified SSC does not have negative impact on the capability to meet design requirements **AND** does not impact the Safety Analysis.

System Nuclear Safety Significance	**Impact**			
	High	**Medium**	**Low**	**Very Low**
Special Safety & S-98, including systems that support such systems. (Requires update of the Issue Tracking File. See [a] below.)	1☐	2☐	3☐	4☐ (Requires Reactor Safety concurrence. See [b] below.)
Safety Related	2☐	3☒	4☐	5☐
Non-Safety	N/A☐			

(a) **Any work on a Special Safety or S-98 system requires update of the issue tracking file to require consultation with Station Reactor Safety during the Detailed Design Phase** to determine (1) whether the station Probabilistic Risk Assessment (PRA) requires update, and (2) if yes, who will perform the update, by when (see 3.11 below).

(b) If risk level is 4 on a Special Safety or S-98 system (including systems that support such a system), Station Reactor Safety should be contacted for concurrence with the risk level evaluation, and Station Reactor Safety should sign for their concurrence in Part 2.

Justification: The proposed modification excludes a direct connection between the new storage and process systems and the existing Moderator System (SCI 32100) and PHT D2O Transfer System (SCI 33850). Rather, a connection between the new storage and process systems and the existing D2O Supply and Inventory System (SCI 38110) is proposed.

According to NK38-LIST-06937-10001, SCI 38110 is a safety related system as it protects and supports other safety related systems. The proposed connection could impact the credited response of the S&I system to supply heavy water to the unit's D2O storage tank, to maintain the heat sink of a shutdown unit by topping up inventory requirements, or during typical moderator on-line transfers. A leak or rupture in the new storage volume could draw water from the existing S&I system.

The impact is rated at medium because the existing S&I system is credited to fulfill the safety related functions, and appropriate isolation with the new storage volumes is part of this modification to mitigate the risk discussed above.

1.4 **Equipment Risk**. Any risk to OPG facilities or equipment.

Consider risk to equipment being installed and to interfacing systems. This is **only** the cost of replacing the damaged equipment (including approximate estimated labour costs), and does not include employee safety, environmental, production losses, or reactor safety impacts. That is, the employee safety, environmental, production, or reactor safety risk due to losing the equipment is incorporated in the other risk categories.

Evaluate risk based upon both **periodic** and **one-time** loss potential, including common mode failures. In tables (A) and (B), pick the one row that best categorizes the cost, and then, if applicable, determine frequency. **The higher of the two risks is the one assigned.**

(A) Periodic Loss Potential:

Estimated Periodic Damage Cost	FREQUENCY OF PERIODIC EQUIPMENT LOSS		
	Once a year	Once every 2 years	Once every 10 years
≥ $1,000,000	1☐	2☐	3☐
≥ $100,000	2☐	3☐	4☐
≥ $10,000	3☐	4☒	5☐
< $10,000	N/A☐		

(B) One-time Loss Potential:

Risk Level 1	> $6,000,000□00	☐
Risk Level 2	$2,000,000.01 to $6,000,000.□0	☐
Risk Le□el 3	$200,000.01 to $2,000,000.00	☒
Risk Level 4	$50,000.01 to $200,000.00	☐
Risk Level 5	$10,000.01 to $50,000.00	☐
Risk Level N/A	$10,000.00 or less	☐

Highest Risk Level Rating from (A) or (B): 3

Justification: Of greatest consequence for periodic loss potential is pump maintenance during the refurbishment outages. Improperly modifying the D2O Transfer pumps (0-38110-P1/26/7/8/9 or the downgraded D2O Transfer pumps (X-38110-P1/P2) could result in cyclical maintenance.

Assuming irreparable damage to ¼ of the D2O storage tanks and 1 of the 4 new transfer pumps, a one-time loss of roughly $500,000 is possible.

1.5 **Production Risk**. Risk of revenue loss due to loss of electricity generation, tritium removal facility production, cobalt-60 production, or other revenue methods (including due to equipment failure) **during change implementation** (installation and commissioning) and **during operation for production**.

Production risk excludes the economic justification for performing the modification, and therefore excludes the probable consequences of **not** implementing the modification. The revenue risk should be inherent in the modification package and **not** the consequence of inadvertent human error.

Evaluate risk based upon one-time revenue loss potential, including common mode failures, for:
(a) If one unit is forced to discontinue production due to modification failure.
(b) If the modification fails during implementation in one unit.
Note that unlike many other risks, there is no periodic loss potential.

In both of tables (A) and (B), pick the one row that best categorizes the cost. **The higher of the two risks is the one assigned.**
For electricity production, use an assumed rate to sell electricity of $53.00 per MWh x # MWh lost (rate reference: OEB report EB-2007-0905 "in the manner of an application by Ontario Power Generation Inc., Payment Amounts for Prescribed Facilities, Decisions with reasons 3 Nov 2008").

(A) One-time Revenue Loss Potential, during one unit's operation for production:

Risk Level 1	> $10,000,000.00	☐
Risk Level 2	$4,000,000.□1 to $10,000,000.00	☒
Risk Level 3	$1,000,000.01 to $4,000,000.00	☐
Risk Level 4	$200,000.01 to $1,000,000.00	☐
Risk Level 5	< $200,000.00	☐
Risk Level N/A	None (zero dollars)	☐

(B) One-time Revenue Loss Potential, during implementation for one unit:

Risk Level 1	> $10,000,000.00	☒
Risk Level 2	$4,000,000.□1 to $10,000,000.00	☐
Risk Level 3	$1,000,000.01 to $4,000,000.00	☐
Risk Level 4	$200,000.01 to $1,000,000.00	☐
Risk Level 5	< $200,000.00	☐
Risk Level N/A	None (zero dollars)	☐

Highest Risk Level Rating from (A) or (B): A

Justification: During operation, the worst case scenario regarding failure of this modification is losing the ability to return heavy water to the unit at completion of the outage. This would extend the unit outage and result in lost operating capacity. An estimated 168 hours for full repair results in lost revenue of $8.0M. Note that at any time during refurbishment, 2 units may be shutdown, with an expected gap of 18 months between shutdowns and start ups. A failure in one unit would allow 18 months for correction until the second unit would require heavy water for start-up. As well, moderator water from a unit being shutdown can be transferred to a refurbished unit should the need arise.

Should implementation of the modification be delayed, a regulatory requirement to shut down Unit 2 in 2015 based on fuel channel life cycle management commitments may result in an undetermined amount of production loss. At the established rates, a delay of roughly 9 days or more would lead to a loss of $10.0M, which is plausible for this modification.

Also during implementation, modifications to building support systems; mainly the ventilation or electrical power systems, could result in lost revenue at the TRF. Shutdown of the building ventilation

limits the operations of the HWMB/TRF as no radiological work can be conducted. No TRF outages are scheduled during the construction of this facility, and at a HWMB/TRF combined revenue loss rate of $800,000 per day, and an expected shutdown time of 14 days, OPGN would expect to lose over $11M.

1.6 **Security Risk.** Any risk to security barriers or systems. Includes, but is not limited to, obstructing fields of view of security equipment or work within 5 metres of a security barrier or building.

Any changes to security systems are rated based on the impact of change.

The following are guidelines only:

- **High Impact:** Implementing significant changes or temporarily impacting multiple systems.
- **Medium Impact:** Implementing significant changes or temporarily impacting a single system, or a straightforward change or temporarily impacting multiple systems.
- **Medium-Low:** Straight forward change or temporarily impacting a single system involving more than one installation work group.
- **Low:** Straight forward change or temporarily impacting a single system involving a single installation work group.

System	IMPACT OF CHANGE				
	High	Medium	Medium-Low	Low	Not Applicable
Any Security System(s)	1☐	2☐	3☒	4☐	N/A☐

NOTE: Unless risk level is N (not applicable), Security should be contacted to become involved in the design process. This contact and the results should be documented in the following justification for the risk level.

Justification: This modification will impact two security systems. In constructing a new building and attaching/connecting it to the existing HWMB/TRF, evaluation of security features such as doors and monitoring for the existing HWMB/TRF must be included in this modification. The building will be greater than 5 m from a security barrier, but may impede sight lines and access.

As well, security cameras located on the West face of the current HWMB/TRF would require relocation, which could impact proper surveillance of the site. Approximately two cameras currently monitor an area including the standby generator oil storage tanks, standby generator buildings and roadways.

1.7 **Safe Operating Envelope (SOE) Margin**. Level of impact on the station SOE margin by a successful installation of the modification (for example, change in set-points or parameters, change in availability). Consider normal operating limits, safe operating limits, and design limits.

The following are guidelines only:

- **High Impact:** Successful installation of the modification reduces an SOE margin by 20% or more.
- **Medium Impact:** Successful installation of the modification reduces an SOE margin by 5% to under 20%.
- **Low Impact:** Successful installation of the modification reduces an SOE margin by less than 5% or increases the SOE margin.
- **Not Applicable:** Has no impact on SOE margin.

SOE Margin	IMPACT			
	High	Medium	Low	Not Applicable
Impact on SOE margin.	1☐	2☐	3☒	N/A☐

Justification: The modification proposes no connections to the existing moderator and PHT systems; rather, tie-ins to process systems at the HWMB/TRF are required to limit the impact on the station SOE margin. Connections to the existing S&I system would increase the margins as more water would be available for use in other operating units, but failures of the new equipment could impact the credited ability of the S&I system to send water to the D2O storage tank of each unit (NK38-OSR-08131.02-10015).

1.8 **System Impact.** Level of impact on a station system(s).

The following are guidelines only:

- **High Impact:** Modification requires installation of a new station system(s).
- **Medium-high Impact:** Modification requires installation of a new station sub-system(s).
- **Medium Impact:** Modification requires significant changes to an existing station system(s).
- **Low Impact:** Modification requires minor changes to an existing station system(s).
- **Not Applicable:** Modification only requires changes to components or structures, and has no impact on operating parameters.

System	**IMPACT OF CHANGE**				
	High	**Medium-High**	**Medium**	**Low**	**Not Applicable**
Any Station System(s)	1☒	2☐	3☐	4☐	N/A☐

Justification: This modification proposes the addition of a new independent D2O storage system and a new drum handling system, as well as extensive changes to existing systems. Mainly, a D2O storage system focussed on the safe storage of tritiated heavy water and the ability to transfer this water to/from D2O process systems such as S&I (SCI 38110), D2O Transfer (SCI 38500), D2O Clean up (SCI 38410), TRF Feed and Product (SCI 39300) and Station Upgrader (SCI 38430). The new D2O storage system will be designed as an independent system comprised of major equipment such as tanks, pumps, ion exchangers, valves, and fans that can be completely isolated from the existing process systems as required.

Major modifications to existing process and interfacing/supporting systems are required for safe operation of the new facility. These tie-ins will be numerous, and include the following systems among others: Heavy Water Management Building (SCI 23800), Electrical Power (SCI 50340 and 50320), Inactive and Active Drainage (SCI 79710 and 79110) and Fire Detection and Fire Protection (SCI 67870 and 78100).

1.9 **Operations or Maintenance (Ops or Mtce) Documentation Impact.** Level of impact on Ops or Mtce documents, such as manuals or procedures, whose revision or creation is controlled by any of:

- N-PROC-AS-0028, Development, Review, and Approval of Technical Procedures
- N-INS-09100-10000, Processing Maintenance Procedures Using Curator Workflow.
- N-INS-09100-10004, Processing Non-Intent Changes To Operating Procedures Using Curator Workflow
- N-INS-09100-10006, Processing Intent Changes to Abnormal Incident Manual/ Operating Procedures Using Curator Workflow

To determine the Risk Level, choose the one row in the table that describes the system involved in the modification with the highest nuclear safety significance, and then choose the impact.

The following are impact guidelines only:

- **High Impact:** Modification requires new Ops or Mtce document for an Infrequently Performed Test or Evolution (IPTE)
- **Medium-high Impact:** Modification requires intent changes to existing Ops or Mtce IPTE document **or** creation of new Ops or Mtce document that is **not** for an IPTE.
- **Medium Impact:** Modification requires intent changes to Ops or Mtce non-IPTE document.
- **Low Impact:** Non-intent (administrative) changes to existing Ops or Mtce document, or for only Cat ID or make/model changes to existing Ops or Mtce document.
- **Not Applicable:** Modification does not require changes to Ops or Mtce documentation.

System	IMPACT OF CHANGE				
	High	**Medium-High**	**Medium**	**Low**	**Not Applicable**
Special Safety & S-98, including systems that support such systems.	1☐	2☐	3☐	4☐	N/A☐
Safety Related or Non-Safety	2☐	3☒	4☐	5☐	

Justification: The system of greatest significance that is affected by this modification is D2O S&I (SCI 38110).

Currently, draining a moderator to the existing S&I system is considered an IPTE according to NK38-OM-32100 and N-LIST-09110-10001. Revision to the existing IPTE to allow for moderator draining to and filling from the new storage tanks is required.

Numerous other documents to facilitate operation and maintenance of the new systems and facility are required in this modification. Operating Manuals, Ops and Maintenance Procedures, Calibration Sheets and Training Documentation among others, are the types of new documents that will be needed.

1.10 **Complexity** – the level of difficulty in the design and implementation of the modification.

1.10.1 **Level of Design Complexity**

To be considered minimal and simple:

(a) The modification can be approved by one Engineering Section Manager, with additional disciplines (that is, designers working for a different Section Manager) only providing support if required.

(b) Any code application is direct; interpretation is not required (that is, a 'cookbook' design)

(c) If calculations are required to demonstrate code requirements can be met, the calculations should be performed by hand calculations or established software. If analysis is required to reduce conservatism so that an acceptable result can be obtained (for example, modeling), then the modification complexity cannot be classified as simple.

Is the design effort minimal and simple?	Yes ☐	No ☒

Justification: There are multiple disciplines involved in this modification including civil, mechanical, electrical and I&C, and different Design ECs will have to be approved by Design Section Managers of different disciplines.

1.10.2 **OPEX and Design Maturity**

The design cannot use new technology (that is, not previously installed in OPGN) or unproven methodology.

Has OPEX been considered **AND** is the design based on a proven design or a combination of proven design elements?	Yes ☒	No ☐

Justification: OPEX from Pickering, Bruce, Point Lepreau and Wolsong D2O storage projects has been considered. Most lessons learned focus on project and contract management with design agencies, but relevant major technical OPEX includes:

Over pressure protection and PB reconciliation - RV58 at Bruce, which DNGS also has, challenged the PB registration of the new storage tank systems because it did not satisfy the over pressure protection requirement for the system. At DNGS, MEC 113987 is underway to correct the legacy PB issue related to a reducer on the outlet piping of RV58, which violates ASME Sec III requirements (NK38-CORR-38110-0373409).

Tank Classification - Bruce used NC3 for all tank classification, which simplified the design and operability, but increased the cost. A similar approach will be used with the new tanks at Darlington, and appropriate connections to the existing PHT S&I tanks (SCI 38110) shall be included in this modification.

Portable IX columns used at Pickering and the Bruce simplified operations of the facility. This modification will use this approach as well.

Spent Resin Storage Tanks (SRST) - Wolsong uses a separated D2O S&I system that a central set of 4 tanks at 70 m3 each and two local tanks designated for sharing between U1/2 and U3/4. For refurbishment, Wolsong modified the 190 m3 SRST tanks by connecting the PHT transfer line to the tanks for a full PHT drain. Point Lepreau also used this approach as they stored moderator water for refurbishment in the S&I tanks, but stored PHT water in the SRSTs. Again, a connection to the PHT transfer system and disconnection from the spent resin system had to be made. This solution is not feasible for this modification at DNGS as the SRSTs comprise 2 x 28.5 m3 tanks, this would produce high radiation fields during the modification installation, and classification of the tanks is at risk based on tritium levels in the moderator system.

In addition to the external site OPEX, a review of DNGS identified a major issue with the electrical power supply. SCRs D-2006-01602 and D-2008-08265 identify deficiencies in the Class II Power system at the HWMB/TRF. There are limitations related to Class II Power; therefore, this modification will Supply Class II loads with Class IV power and provide an interruptible power supply (UPS) to ensure Class II reliability and safety requirements are met. Similarly, BU92 and BU94 in the HWMB/TRF are not expected to be able to support all of the Class IV loads in the new facility. Therefore, coordination with Project 10-73821, DN Electrical Distribution System Upgrade, has been achieved to secure a source of power to satisfy the requirements of this modification.

1.10.3 **Fabrication and Installation**

Fabrication and installation can require more than one trade but should only require simple processes (that is, skill of the craft). If work plans or customized procedures are required to execute the modification, then the fabrication and installation complexity is **not** simple **unless** the customized procedure is only required to document the installation and removal of a design-approved recurring temporary alteration (RTA) (that is, would the procedure be required if it was not an RTA?).

Note: For some installations (for example, software changes) work plans or procedures are routinely used even if the change is very simple. In such cases, justify whether use of such work plan(s) or procedure(s) can be considered simple, or not.

Will the fabrication and installation of the design only require simple processes?	Yes ☐	No ☒

Justification: Multiple disciplines are required for installation and fabrication. Welders, electricians and millwrights are a few of the trades required. Accordingly, multiple work plans and procedures are required for installation. As well, many tasks such as erecting the building and pouring concrete to maintain seismic qualification are complex and infrequently performed at OPG.

1.10.4 **Commissioning**

Can the modification be fully commissioned or tested? (If "No", Enhanced COMS and Enhanced AFS are required.)	Yes ☐	No ☒

Justification: Passive civil structures of this new facility are not commissionable and will require Enhanced COMS and AFS.

1.11 **IAEA Safeguards Risk.** Any effect to monitoring systems placed by the International Atomic Energy Agency (IAEA).

Includes, but is not limited to, potentially obstructing fields of view of IAEA equipment or potentially impacting IAEA equipment power supplies.

Is there any possibility of affecting any IAEA Safeguards System or device? If the answer is 'Yes", add this issue to the Issue Tracking file, with Fuel Handling Technical as the SME.	Yes ☐	No ☒

Justification: As per conversations with HWMB/TRF staff, this modification does not affect the IAEA Safeguards System, as no equipment is monitored by the IAEA in the HWMB/TRF.

1.12 **Design Risk** – the level of risk in the design process.

1.12.1 **Walkdown.** Design risk is greater if a design walkdown is not performed.

1.12.1.1 Is it possible to perform a walkdown? (A walkdown is **mandatory** if a walkdown is possible.)	No ☐		Yes ☒
1.12.1.2 **IF** a walkdown is impracticable (that is, if 1.12.1.1 is "No"), does the Design Authority (DA) agree that a reduced risk and approval modification (RRAM) is justified in spite of increased design risk? If "Yes", DA shall initial here as well as signing in Part 6.→ → →	No ☐	Yes ☐	N/A ☒ (walkdown possible)
	Initials of DA:		

Comments (optional): Preliminary walkdowns for development of a SOW and Conceptual Design Report have been completed. Further detailed walkdowns will be completed for each Design EC.

1.12.2 **Pre-Start Health and Safety Review.** Design risk is greater if a pre-start health and safety review is required.

Complete N-FORM-10853, PSR Determination Checksheet for OPG, Nuclear, and **attach it to this form.** Refer to N-INS-08121.3-10000, Implementation Of Pre-Start Health And Safety Reviews (PSR).

Will the change require a Pre-Start Health and Safety Review?	Yes ☐	No ☒

Comments (optional): Per the PSR Checklist, and Pre-Start Health and Satey Review is not required.

1.12.3 **CNSC Approval or Notification.** Design risk is greater if Canadian Nuclear Safety Commission (CNSC) notification is required.

Complete N-FORM-10369, Canadian Nuclear Safety Commission Approvals and Notifications Screening, and **attach it to this form.**

Is CNSC approval or notification required for this change?	Yes ☒	No ☐

Includes evaluation of changes to Licensing Documents, Use of the Site, Operation & Testing, Changes to Special Safety Systems, Safety Analysis, Pressure Boundary, Safeguards Equipment, or Environmental Qualification.

Comments (optional): Per the CNSC Checklist, CNSC approval will be required.

1.12.4 **Seismic**

Design risk is greater if seismic requirements are affected. Includes, but is not limited to, piping, tubing, supports, and installation of CEDA boxes.

Pickering users, including for systems common to A and B, may refer to NA44-DG-03650-00001, Seismic Design Guide for Seismic Qualification of Pickering NGS A Success Path Structures, Systems and Components, and NA44-REP-03650-00002, Pickering A – Administrative Controls for Seismic Qualification.

Darlington Users may refer to DG-91-01040-1-39113, Design Guide – Design Requirements, Criteria and Methods for Seismic Qualification of CANDU Nuclear Power Plants.

Could the change **degrade** the current seismic qualification of the system?	Yes ☒	No ☐

Justification: The portion of the substructure of the existing HWMB that encloses the existing D2O S&I tanks is seismically qualified to DBE category D. This qualification will be affected by connections to the existing building, and a similar qualification to meet the requirements of DG-38-03650-2B is required for the portion of the new facility that encloses the new D2O storage tanks.

1.12.5 **Environmental Qualification (EQ).** Design risk is greater if EQ is a design concern.

Users may refer to N-GUID-03651-10000, Guide to Environmental Qualification Design Changes.

Could the change degrade the current EQ of the system?	Yes ☐	No ☒

Justification: All equipment in the new facility is not expected to see "harsh" conditions, and is not credited to perform a safety related function in a DBA.

1.12.6 **Fire Protection.** Design risk is greater if the change impacts on the station Fire Protection Program.

Is an SSC modified in **ANY** of the following categories:	Yes ☒	No ☐
1.12.6.1 Access to fire detection or alarm equipment? (For example, walls in front of the manual fire alarms, new equipment beside an automatic alarm.) 1.12.6.2 Effectiveness of fire detection or alarm equipment? (For example, increases in noise level, lighting changes that make visible alarms hard to see.) 1.12.6.3 Access to fire suppression equipment? (For example, new wall blocking access, corridors narrowed so that fire cart access is limited)? 1.12.6.4 Effectiveness of fire suppression equipment? (For example, room temperatures, water freezing concern, room volumes, air flow, room drainage.) 1.12.6.5 Modifies fire barriers? (For example, fire doors, fire and smoke dampers in HVAC ductwork, penetrations in credited barrier, fire stops.) 1.12.6.6 Introduces potential ignition sources? (For example, circuits, cables or high temperature equipment.) 1.12.6.7 Introduces combustible material? (That is, type [for example, flammable gases or liquids even if normally contained, or flammable solids], quantity, and exposure of.) **Note**: Combustible Material, in the form in which it is used, and under the condition anticipated, will ignite, support combustion, burn, or release flammable vapour when subject to fire and heat. 1.12.6.8 Modifies hazard control measures (For example, curbs, drains, exhaust, ventilation for flammable vapours or smoke.) 1.12.6.9 Modifies an electrical circuit for a system or component credited in the Fire Safety Assessment (FSA)? 1.12.6.10 Alters hydraulic performance of any fluid system that provides suction source (NPSH) for a system or component credited in the FSA? 1.12.6.11 Alters an essential support function for a system or component credited in the FSA (for example, equipment or room cooling, lubrication)?	If Yes, complete N-FORM-10287, Fire Protection Impact Evaluation, attach it to this form, and Contact Fire Protection SME and Fire Safe Shutdown Analysis SME. Summarize in Justification and add details to the Issue Tracking File.	

Justification: This modification will require extensive changes to the existing Fire and Smoke Detection System (SCI 67870). The new HWSF requires its own detection system that must be connected to, and interface with, the existing fire panels in Unit 0. The new facility also requires fire protection equipment to meet the requirements of CSA N293-07.

The proximity of the new building to the standby generator oil tanks is expected to be no closer than 9 m from the dike. As a result, the National Fire Code requires that these tanks meet three specific NFPA standards as follows. Should the configuration of the oil tanks not meet these standards, the new facility must be located 27 m from the SG oil tanks, which is not feasible, or modifications to the SG oil tanks is required.

- **Continue to Part 2, Risk Summation.**

PART 2. RISK SUMMATION

Transcribe all ratings from Part 1. The modification process is based on the risk assessment.

Part 1 question number	Risk Category	Transcribed Risk Rating: Standard Modification Required	Transcribed Risk Rating: RRAM Permitted
1.1	Employee Safety	☐ 1 ☐ 2 ☒ 3	☐ 4 ☐ 5 ☐ N/A
1.2	Environmental	☐ 1 ☐ 2 ☒ 3	☐ 4 ☐ 5 ☐ N/A
1.3	Nuclear Safety	☐ 1 ☐ 2 ☒ 3	☐ 4 ☐ 5 ☐ N/A

Reactor Safety concurrence required for risk rating 4 on Special Safety or S-98 system ➔➔↗
(including systems that solely support such systems).

Concurred by: _____ _____ Date: _____
(Reactor Safety) (print name) (signature) (dd-mmm-yyyy)

1.4	Equipment	☐ 1 ☐ 2 ☒ 3	☐ 4 ☐ 5 ☐ N/A
1.5	Production	☒ 1 ☐ 2 ☐ 3	☐ 4 ☐ 5 ☐ N/A
1.6	Security	☐ 1 ☒ 2 ☐ 3	☐ 4 ☐ N/A
1.7	SOE Margin	☐ 1 ☐ 2 ☒ 3	☐ N/A
1.8	System Impact	☒ 1 ☐ 2 ☐ 3	☐ 4 ☐ N/A
1.9	Operations or Maintenance Doc. Impact	☐ 1 ☐ 2 ☒ 3	☐ 4 ☐ 5 ☐ N/A
1.10.1	Level of Design Complexity	☒ No	☐ Yes
1.10.2	OPEX and Design Maturity	☐ No	☒ Yes
1.10.3	Fabrication and Installation	☒ No	☐ Yes
1.10.4	Commissioning	☐ No	☒ Yes
1.11	IAEA Safeguards potentially affected	☐ Yes	☒ No
1.12.1.1	Walkdown possible	☐ No	☒ Yes
1.12.1.2	RRAM justified notwithstanding walkdown impossibility	☐ No	☒ N/A ☐ Yes✚
1.12.2	Pre-Start Health and Safety Review	☒ Yes	☐ No
1.12.3	CNSC Approval or Notification	☒ Yes	☐ No
1.12.4	Seismic	☒ Yes	☐ No
1.12.5	EQ	☐ Yes	☒ No
1.12.6	Fire Protection	☒ Yes	☐ No

✚ If answer is "Yes", DA initials are required at question 1.12.1.2.

- **If ALL transcribed risk ratings are in the "RRAM Permitted" column, a reduced risk and approval modification (RRAM) has been justified.**
- **ANY transcribed risk rating in the "Standard Modification Required" column means that a standard modification is required.**

NOTE: If a RRAM is permitted, a designer may nonetheless choose to perform a standard modification.

Continue to Part 3, Mandatory Actions for All Modifications Prior to Approvals.

PART 3. MANDATORY ACTIONS FOR ALL MODIFICATIONS PRIOR TO APPROVALS

3.1 **Software. Answer all ten questions.** If unsure, consult Section Manager, Computers and Controls Design. Answers will determine process and rigour to be followed during Detailed Design activities.

Note: All software used at OPG is classified into type according to N-PROG-MP-0006, Software. The following questions refer to software classified as (1) Real-Time Process Computing (RTPC) software, (2) Scientific, Engineering, and Safety Analysis (SESA) software, or (3) Software Engineering Tool.

In questions 3.1.1 and 3.1.2 below, for every "**no**" answer summarize and justify below. Include details in issue tracking file for action during the design phase. Briefly justify any "yes" answer.		**N/A**	**Yes**	**No**
3.1.1	If RTPC software is involved in the modification, is the safety significance criticality level of the RTPC software known and documented? *(If no, follow N-STI-69000-10000, Software Categorization.)*	☐	☒	☐
3.1.2	If RTPC software is involved in the modification, is the cyber security impact of the modification documented? *(If no, follow N-PROC-MP-0103, Security for Real-Time Process Computing Systems, to identify and classify the cyber asset and determine the cyber-security considerations.)*	☐	☐	☒

Justification: For RTPC software related to D2O storage processes (SCI 38110 D2O Supply System), Category III shall be used. This is supported by: (1) As per D-SRP-3.03 (now superseded), SCI 38110 was initially classified as a Group G safety related system; (2) In discussions with the SM Reactor Safety and TRF System Engineer, it was determined that the Group G designation still applies to SCI 38110, as it pertains to software categorization by N-STI-69000-10000; (3) As per NK38-REP-66800-002, the existing TRF/HWMB DCU software was determined to be Category III.

For RTPC software related to SCI 67989, tritium stack monitoring for the building (if any new software required), Category II shall be used.

Cyber security impact is to be considered during the detailed design phase. There is not expected to be an impact, as this project will utilize the existing TRF/HWMB distributed control system.

In questions 3.1.3 through 3.1.10 below, for every "**yes**" answer summarize and justify below. Include details in design/issue tracking file for action during the design phase. Briefly justify any "no" answer.		**Yes**	**No**
3.1.3	Is there a change with this modification that affects existing software categorizations and qualifications of devices? *(If yes, follow N-STI-69000-10000, Software Categorization.)*	☐	☒
3.1.4	Is in-house computer system development or software development involved? *(If yes, follow N-PROC-MP-0099, Development of Real-Time Process Computing Systems.)*	☐	☒
3.1.5	Is modification of existing software or devices with software involved? *(If yes, follow N-PROC-MP-0100, Maintenance of Real-Time Process Computing Systems, and the system specific software maintenance plan.)*	☒	☐
3.1.6	Does the modification involve changes to any Digital Control Computer (DCC) inputs/outputs or annunciation messages? *(If yes, then for Pickering complete appropriate form: P-FORM-10559, Pickering A Annunciation and IO Change Request Form, P-FORM-10781 Pickering B Annunciation and IO Change Request Form. For Darlington consult NK38-MAN-60310-10001, Annunciation Design Guide.)*	☒	☐
3.1.7	Is procurement of any software or equipment which may contain software involved (for example, software or equipment which may contain microprocessors, custom or off-the-shelf software, embedded software [firmware], computers, or programmable devices such as programmable logic controllers [PLC] [configurable software])? *(If yes, follow N-PROC-MP-0049, Procurement of Software and Products Containing Software).* **Note:** This includes external vendor software development, qualification, and maintenance services.	☒	☐
3.1.8	Is software going to be used to perform or support design and analysis of safety-related equipment or SSCs? *(If yes, follow N-STD-MP-0008, Development, Qualification, and Use of SESA Software, to determine the required level of SESA software quality assurance commensurate with the significance of the activity involving use.)*	☒	☐
3.1.9	Will computer-based system(s) be retired? *(If yes, follow requirements in N-PROG-MP-0006, Software, to retire the software.)*	☐	☒

3.1.10 Are Software Engineering Tools involved? *(If yes, qualify the software tools for use in accordance with N-STI-69000-10002, Qualification of Software Engineering Tools.)*	☒	☐

Justification: Software categorization and qualification of existing equipment in the TRF/HWMB will not be affected by this modification. Additions to existing systems shall maintain the same functional and performance requirements that will allow the software specifications to remain the same.

This modification will create change paper, I/O list, and a Program Requirements Specification for use in updating the existing TRF/HWMB distributed computer system software. This update must be completed by the OEM. There is another Project #16-31436 for upgrading of TRF software that this work must be coordinated with.

It is expected the equipment containing microprocessors, custom or off-the-shelf software, and/or embedded firmware will be required. One new annunciation in the control room for leak detection will be added, and various pieces of equipment (PLCs, level switches, etc) will be procured through this modification.

Software Procurement activities as identified in N-PROC-MP-0049 are premature at this point in the modification, and "planning" has been considered, but will be executed in the design phase.

3.1.8 and 3.1.10 are assumed "Yes" until the Design Agency is engaged and the requirement for design & analysis software or Software Engineering Tools can be confirmed.

3.2 **Human Factors.** Will the modification involve or affect:	**Yes**	**No**
(a) A conventional manual control or information display	☒	☐
(b) Computer hardware or display content?	☒	☐
(c) Logic or process dynamics that the operator/maintainer would be aware of?	☒	☐
(d) Equipment that personnel use to assist physical work? (For example, work station furniture, crane controls, hoists – excludes hand-held tools.)	☒	☐
(e) Adding, removing, or changing Operation or Maintenance procedures? (How many will require update, what type, to what extent) If yes, add to issue tracking file as separate item.	☒	☐
(f) The ease with which personnel can perform their duties? (That is, potentially affecting making a task harder or easier.)	☒	☐
(g) The quality of the physical work environment?	☒	☐

Answers will determine process and rigour to be followed during Detailed Design activities.

If unsure, consult Human Factors Engineering (HFE) Specialist.

***If any of questions (a) through (g) above were answered "yes"**, complete N-FORM-10580, Identifying Human Factors Level of Activity, which will identify the scope of HFE work to be done during the design phase. Contact an HFE Specialist or Section Manager for concurrence on N-FORM-10580. Summarize and justify below. Indicate in the Issues Tracking File which of N-FORM-10221, Human Factors Worksheet, or Human Factors Engineering Program Plan is required during the design phase.*

If all questions (a) through (g) above were answered "No", justify.

Justification: The Human Factors scope of this modification includes: field controls, control panel alarms, mechanical equipment (cranes, carts, hoses, etc), reconfiguration of office space, and reconfiguration of existing equipment. N-FORM-10580 indicates a Human Factors Engineering Program Plan is required for this modification as the related scope affects multiple HF requirements.

3.3	Does the modification replace, alter, add, remove, or otherwise affect a device that is, or should be, lockable to isolate energy for work protection purposes? *(If yes, include details in the issue tracking file to, during later phases of the modification process, at a minimum: [1] ensure the device is lockable, [2] ensure Performance Engineering or Plant Status Control is contacted to get Operational Flowsheet appropriately updated, and [3] contact plant Status Control to update device information in ESM II to identify the device as lockable. Summarize comments and issues below. If unsure, contact Manager, Operations Programs. Reference: N-STD-MA-0001 Work Protection.)*	Yes ☒	No ☐
Comments: Mechanical equipment including isolation valves and dampers and electrical equipment such as breakers, MCCs and PLCs will need to be lockable for worker protection during maintenance. During construction, these items are also of concern, and must be locked out as well.			
3.4	Will any equipment be abandoned in the plant? *(If Yes, include details in the issue tracking file, to, during later phases of the modification process, at a minimum: [1] add station Plant Status Control to the Stakeholder Involvement Attribute, and [2] involve Plant Status Control in the development of requirements for equipment end states such as, but not limited to, isolation, de-energization, work protection, and tagging.)*	Yes ☐	No ☒
Comments: All modifications to existing SSCs are expected to be additions or replacements, and no abandonment is expected.			
3.5	Does the modification replace, remove, or abandon equipment or component(s) that can be considered unique (that is, no other SSC in the plant share the same parts)? *(If yes, include details in the issue tracking file to [1] Add [a] Supply Chain and [b] Maintenance to the Stakeholder Involvement Attribute, and during later phases of the modification process, at a minimum: [2] develop a list of Cat IDs for components, equipment, and spare parts that can be made surplus, [3] arrange for Maintenance validation of the list, and [4] transmit validated list to Supply Chain post-turnover. Summarize comments and issues below.)*	Yes ☐	No ☒
Comments: All modifications to existing SSCs are expected to be additions or replacements, and no abandonment is expected.			

3.6	**Attach completed N-FORM-10853**, PSR Determination Checksheet for OPG Nuclear, (completed in Step 1.12.2) to this form**.**
3.7	**Attach completed N-FORM-10369**, Canadian Nuclear Safety Commission Approvals and Notifications Screening, (completed in Step 1.12.3) to this form.
3.8	**Complete and attach N-FORM-10528**, Pressure Boundary Designer's Checklist, to this form.
3.9	**Complete and attach N-FORM-10560**, Chemistry Design Change Checklist, to this form.
3.10	**Create an action request** of type TCC to group NPESTM for evaluation of training impacts, including the estimated installation date in the notes of the AR. Creation of action request is optional for Temporary Modifications based on the Design Engineer's evaluation of potential impact on training. AR #28132675.

3.11	**IF** change impacts equipment in a Special Safety or S-98 (refer to question 1.3), **confirm** the Issue Tracking File has had an item added to require consultation with Station Reactor Safety during the design phase to determine (a) whether the station Probabilistic Risk Assessment (PRA) requires update, and (b) if update is required, to determine who will be responsible for the update, including a target completion date. ☐ System is Special Safety or S-98. Issue Tracking File has been updated. ☒ Not applicable: system is **not** Special Safety or S-98.
3.12	**IF** change impacts equipment in a safety-related system, **confirm** a Design Plan will be prepared **during the design phase** in accordance with N-PROC-MP-0074, Design Plan**,** and add Design Plan preparation to the Issue Tracking File. ☒ System is safety-related. Design Plan will be prepared. ☐ System is **not** safety-related. Design Plan preparation depends on assessed risk.
3.13	**Choose one** of the following options: ☒ Formal modification design requirements **will be produced during the modification preliminary engineering phase** using N-TMP-10187, Modification Design Requirements (Note: N-TMP-10187 production may be required if performing a standard modification, see N-FORM-10959, Design Scoping Checklist, Section 7)**.** Add formal modification design requirements preparation to the Issue Tracking File. ☐ Informal modification design requirements **are documented below:**
Note: Part 6 Approvals include approval of this section 3.13.	

3.14 Forms. List any additional forms that are to be attached to this Modification Outline (for example, as called up by N-FORM-10959, or as determined by the Design Section Manager). List any documents used as references in the development of this Modification Outline on the Master EC Ref Docs panel.

(i) NK38-REF-38000-0388269
(ii) N-PCH-09701-10001
(iii) NK38-LIST-06937-10001
(iv) D-INS-09701-10013
(v) N-LIST-09110-10001
(vi) NK38-OM-32100
(vii) NK38-OSR-08131.02-10015

Associated Forms:

N-FORM-10287, Fire Protection Impact Evaluation
N-FORM-10369, CNSC Approvals and Notifications
N-FORM-10422, Environmental Impact Worksheet
N-FORM-10445, Software Categorization Checklist
N-FORM-10446, Software Categorization Result Form
N-FORM-10528, Pressure Boundary Designer's Checklist
N-FORM-10529, Reactor Safety Designer's Checklist
N-FORM-10560, Chemistry Design Change Checklist
N-FORM-10580, Identifying Human Factors Level of Activity
N-FORM-10853, PSR Determination
N-FORM-10959, Design Scoping Checklist

- **In ALL cases, complete Part 5 (below) if applicable.**
- **If a Standard Modification is being performed, continue to Part 4, Additional Standard Modification Mandatory Actions.**
- **If a RRAM is being performed, go to Part 6, Approvals.**

PART 4. ADDITIONAL STANDARD MODIFICATION MANDATORY ACTIONS

4.1 Preparer of this Modification Outline to complete, or arrange for completion of, **N-FORM-10959** and **attach it to this form.**

4.2 COMS, in accordance with N-PROC-MP-0083, Constructability, Operability, Maintainability, and Safety (COMS), is required to be completed prior to Design EC approval unless waived by the DA in Part 6. Add COMS work to the Issue Tracking File. Also see note in Part 5.1, Revision Summary.

Continue to Part 6, Approvals.

PART 5. REVISION SUMMARY and LIST OF REQUESTED DEVIATIONS

5.1 Revision Summary

If Modification Outline is revised for any reason, note the applicable Master EC revision number and summarize the revision.

Note: Intent revisions to the modification may require additional COMS meetings or other re-work in order to address new issues. Such re-work should be noted in the Issue Tracking File.

Initial issue, no revisions.

5.2 List of Requested Deviations

List any requests for deviation from N-PROC-MP-0090, Modification Process, requirements, and the rationale for each request.

Note: In accordance with N-STD-AS-0002, Procedural Use and Adherence, deviation from procedural statements with the verb “shall” may **not** be requested or approved.

No deviations are requested.

PART 6. APPROVALS

EC Number: 88528 **EC Revision Number:** 000 **TMOD** ☐ **GMOD** ☐

Pick one result:

☐ RRAM permitted in Part 2 of this form. Actions required by Part 3 are complete.
☒ Standard modification required. Actions required by Parts 3 and 4 are complete.

Prepared by:	Michael Ferrarelli/Satya Mallampalli (print name)	(signature)	Date: (dd-mmm-yyyy)
Reviewed by: (If applicable)	(print name)	(signature)	Date: (dd-mmm-yyyy)
Reviewed by: (If applicable)	(print name)	(signature)	Date: (dd-mmm-yyyy)
Verified by:	(print name)	(signature)	Date: (dd-mmm-yyyy)
Concurred by: (If applicable)	(print name)	(signature)	Date: (dd-mmm-yyyy)
Concurred by: (If applicable)	(print name)	(signature)	Date: (dd-mmm-yyyy)
Approved by✱: (Design Section Mgr)	(print name)	(signature)	Date: (dd-mmm-yyyy)

✱If Design Agency SM, identify company name: _____

Accepted by✖: (OPG Section Mgr)	(print name)	(signature)	Date: (dd-mmm-yyyy)

(✖ If applicable, that is, if Design SM is from a Design Agency and Design Plan, Design Agency Interface Agreement, or other contract document indicates OPG acceptance is required)

Design Approval (by Design Authority [DA])

DA to indicate:

(a) Is DA signoff required on Design EC release(s)? Yes ☐ No ☐
(DA release signoff is mandatory for modifications risk-rated 1, 2, or 3 in Questions 1.1 through 1.7)
(b) Is the Standard Modification requirement for formal COMS waived? N/A ☐ Yes ☐ No ☐
(c) Is an Available For Service (AFS) Declaration required? Yes ☐ No ☐
(d) Are procedural deviations (listed in Part 5.2) being approved? Yes ☐ No ☐

Design Approval: (DA)	(print name)	(signature)	Date: (dd-mmm-yyyy)

Installation Approval (by Director, Operations & Maintenance [DOM])

DOM to indicate:

(a) Is DOM signoff required on Design EC release(s)? Yes ☐ No ☐
(b) Is Operational Decision Making meeting required prior to installation? Yes ☐ No ☐
(c) Is a post installation AFS walkdown required? Yes ☐ No ☐

Installation Approval: (DOM)	(print name)	(signature)	Date: (dd-mmm-yyyy)