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10 CFR 50.90
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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Exigent License Amendment Request for a One-Time Extension of the Shutdown Service Water Division 2 Subsystem Completion Time

References:
1. NRC Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Revision 2, dated May 2011
2. NRC Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," Revision 1, dated May 2011
3. NRC Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 2, dated March 2009

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," and 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (a)(6), Exelon Generation Company, LLC, (EGC) is requesting an exigent amendment to Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1. This exigent amendment request proposes a one-time extension of the Completion Time (CT) to restore the Division 2 Shutdown Service Water (SX) subsystem to Operable status associated with Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.7.1, "Division 1 and 2 Shutdown Service Water (SX) Subsystems and Ultimate Heat Sink (UHS)," from 72 hours to 7 days. This proposed change will only be used one time during a CPS planned Division 2 SX pump replacement scheduled for the week of October 26, 2015.

The current TS LCO 3.7.1, requires that the Division 1 and 2 SX subsystems be Operable in Modes 1, 2, and 3. TS LCO 3.7.1, Required Action B.1 states that with the Division 1 or 2 SX

subsystem inoperable, the inoperable subsystem is to be restored to Operable status in 72 hours. An extension of the CT for one division of SX to be inoperable from 72 hours to 7 days is needed to preemptively replace the Division 2 SX pump due to degrading performance. This evolution is not a typical maintenance activity that can be performed within the existing 72 hour CT window and current planning estimates have indicated that this pump cannot be replaced within the current CT.

Replacement of the SX pump will be conducted during a planned system outage; however, due to the system configuration necessary to replace the degraded SX pump, the Division 2 SX subsystem will be declared inoperable putting CPS in a Condition with a 72 hour CT. Consequently, not being able to complete the Division 2 SX pump replacement in the 72 hour CT would require CPS to be shutdown in accordance with TS 3.7.1, required Action C.1.

The proposed changes have been evaluated using the risk-informed processes described in Regulatory Guide (RG) 1.174 (Reference 1) and RG 1.177 (Reference 2). The risk associated with the proposed changes was found to be acceptable.

The attached request is subdivided as shown below.

Attachment 1 provides an evaluation of the proposed changes.

Attachment 2 includes the marked-up TS pages with the proposed changes indicated.

Attachment 3 includes the marked-up TS Bases pages with the proposed changes indicated. The TS Bases pages are provided for information only and do not require NRC approval.

Attachment 4 provides a summary of the regulatory commitments contained in this letter.

Attachment 5 provides the supporting risk-informed evaluation of the requested change including an evaluation of the technical adequacy of the PRA in accordance with RG 1.200 (Reference 3).

EGC requests approval of the proposed license amendment on an exigent basis by October 23, 2015, to support the planned replacement of the Division 2 SX pump during the scheduled outage window. If the request is not granted, and prompt action is taken by EGC to replace the Division 2 SX pump, Condition C will require the restoration of the Division 2 SX subsystem within 72 hours or the plant must be shutdown in accordance with Condition C. As noted above, completion of the pump replacement cannot be completed in a 72 hour window. The shutdown of the plant would result in an operational transient that is not necessary because the remaining Divisions of SX are Operable. Considering the recent changes in pump performance and the need to address the degrading performance in a timely manner, EGC could not reasonably have avoided this exigency. The proposed change results in an overall integrated safety improvement by eliminating a degraded material condition and avoiding an unnecessary plant shutdown and startup. Once approved, the amendment will be implemented immediately following approval.

The proposed change has been reviewed by the CPS Plant Operations Review Committee and approved by the Nuclear Safety Review Board in accordance with the requirements of the EGC Quality Assurance Program.

In accordance with 10 CFR 50.91, paragraph (b), EGC is notifying the State of Illinois of this application for license amendment by transmitting a copy of this letter and its attachments to the designated State Official.

Regulatory Commitments are contained in Attachment 4 to this letter. Should you have any questions concerning this letter, please contact Mr. Timothy A. Byam at (630) 657-2818.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 10th day of September 2015.

Respectfully,

Patrick R. Simpson
Manager – Licensing
Exelon Generation Company, LLC

Attachments:
1. Evaluation of Proposed Changes
2. Proposed Technical Specification Pages for Clinton Power Station
3. Proposed Technical Specification Bases Pages for Clinton Power Station (For Information Only)
4. Summary of Regulatory Commitments
5. Risk Assessment and Technical Adequacy of the PRA

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Clinton Power Station
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT 1

Evaluation of Proposed Changes

1.0 SUMMARY DESCRIPTION

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," and 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (a)(6), Exelon Generation Company, LLC, (EGC) is requesting an exigent amendment to Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1. This exigent amendment request proposes a one-time extension of the Completion Time (CT) to restore the Division 2 Shutdown Service Water (SX) subsystem to operable status associated with Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.7.1, "Division 1 and 2 Shutdown Service Water (SX) Subsystems and Ultimate Heat Sink (UHS)," from 72 hours to 7 days. This proposed change will only be used one time during a CPS planned Division 2 SX pump replacement scheduled for the week of October 26, 2015.

2.0 DETAILED DESCRIPTION

The current CPS TS LCO 3.7.1, requires that the Division 1 and 2 SX subsystems be Operable in Modes 1, 2, and 3. TS LCO 3.7.1, Required Action B.1 states that with the Division 1 or 2 SX subsystem inoperable, the inoperable subsystem is required to be restored to Operable status in 72 hours. An extension of the CT to 7 days is needed to preemptively replace the Division 2 SX pump due to degrading performance. In order to replace the Division 2 SX pump, the Division 2 SX subsystem must be isolated. Replacement of an SX pump is not a typical maintenance activity that can be performed within the existing 72 hour CT window and current planning estimates have indicated that this pump cannot be replaced within the current CT.

Replacement of the SX pump will be conducted during a planned system outage window; however, due to the system configuration necessary to replace the degraded SX pump, the Division 2 SX subsystem will be declared inoperable putting CPS in a Condition with a 72 hour CT. Consequently, not being able to complete the Division 2 SX pump replacement in the 72 hour CT would require the unit to be shutdown, in accordance with TS 3.7.1, Required Action C.1.

Therefore, the proposed change increases, on a one-time basis, the CT to restore an inoperable SX subsystem from 72 hours to 7 days. For CPS, the CT extension is planned to be invoked during a planned system outage window. As such, a note is proposed to be added to Condition B of TS 3.7.1 stating that the 72 hour CT does not apply while the Division 2 SX pump replacement outage is ongoing. A new Condition C is proposed to specify the limited use of the 7 day CT for the Division 2 SX pump replacement under those conditions. The former Condition C is changed to Condition D and now addresses Condition B or Condition C Required Action and Completion Time not being met. The former Condition D is renamed as Condition E. The proposed changes are shown on the marked-up CPS TS pages included as Attachment 2. In addition, an informational copy of the associated TS Bases pages with marked-up changes is provided as Attachment 3. This proposed change will only be used one time during a planned Division 2 SX subsystem outage window scheduled for the week of October 26, 2015.

The scheduled pump replacement is anticipated to take approximately 137 hours with an additional 24 hours contingency to account for potential weather delays. If the work exceeds the proposed 7 day completion time, the unit will be shutdown in accordance with TS. Shutdown of the unit with the Division 2 SX subsystem out of service results in no different plant response actions than if the subsystem were to become inoperable under the current TS CT of 72 hours.

3.0 TECHNICAL EVALUATION

System Description

The SX System is designed to provide cooling water for the removal of heat from unit auxiliaries, such as Residual Heat Removal (RHR) System heat exchangers, standby diesel generators (DGs), and room coolers for Emergency Core Cooling System equipment required for a safe reactor shutdown following a Design Basis Accident (DBA) or transient. The SX System also provides cooling to unit components, as required, during normal shutdown and reactor isolation modes. During a DBA, the equipment required for normal operation only is isolated from the SX System, and cooling is directed only to safety related equipment.

The SX System consists of three independent cooling water headers (Divisions 1, 2, and 3), and their associated pumps, piping, valves, and instrumentation. The three SX divisions are separated and protected to ensure sufficient equipment remains operational to safely shutdown the station. Any two SX pumps provide sufficient cooling capacity to support the required safety related systems during safe shutdown of the unit following a loss of coolant accident (LOCA).

Cooling water is pumped from the Ultimate Heat Sink (UHS) by the SX pumps to the essential components through the supply headers (Divisions 1, 2, and 3). After removing heat from the components, the water is discharged to the UHS where the heat is rejected.

The SX System supplies cooling water to equipment required for a safe reactor shutdown. Additional information on the design and operation of the SX System along with the specific equipment for which the SX System supplies cooling water is provided in CPS Updated Safety Analysis Report (USAR) Section 9.2.1.2 and USAR Table 9.2-3 (References 1 and 2, respectively). The SX System is designed to withstand a single active or passive failure, coincident with a loss of offsite power, without losing the capability to supply adequate cooling water to equipment required for safe reactor shutdown.

Following a DBA or transient, the SX System will operate automatically without operator action. Manual initiation of supported systems (e.g., suppression pool cooling) is, however, performed for long term cooling operations.

Three motor-driven vertical wet pit pumps are provided. Pumps A and B are each capable of supplying 16,500 gpm at 275 feet of total head of shutdown service water to Division 1 and 2, respectively, of the system. Pump C is capable of supplying 1100 gpm at 175 feet of total head to Division 3 of the SX System. Automatic backwash type strainers are provided in the

discharge lines of each pump. Division 1 and 2 are crosstied with double isolation valves to provide added flexibility to the system.

The three SX pumps, as well as all motor-operated valves, can be powered from the diesel generators which provide emergency power when offsite power is lost. Each division of SX is powered from its corresponding electrical division. The different electrical divisions are discussed in USAR Section 8.3 (Reference 12). Therefore, loss of one electrical division power supply will not affect the ability of the other two divisions to safely shut down the station.

The SX System and its supported systems are designed with sufficient independence and redundancy such that the removal from service of a component and/or subsystem will not prevent the systems from performing their required safety function.

Safety Analysis

The ability of the SX System to support long term cooling of the reactor or containment is assumed in evaluations of the equipment required for safe reactor shutdown presented in USAR Sections 9.2.1.2, 6.2.1.1.3, and Chapter 15 (References 1, 3, and 4, respectively). These analyses include the evaluation of the long term primary containment response after a design basis LOCA. The Division 1 and 2 SX subsystems provide cooling water for the RHR suppression pool cooling mode to limit suppression pool temperature and primary containment pressure following a LOCA. This ensures that the primary containment can perform its intended function of limiting the release of radioactive materials to the environment following a LOCA. The Division 1 and 2 SX subsystems also provide cooling to other components assumed to function during a LOCA (e.g., RHR and Low Pressure Core Spray Systems). Also, the ability to provide onsite emergency AC power is dependent on the ability of the SX System to cool the DGs.

The safety analyses for long term containment cooling were performed, as discussed in USAR Sections 6.2.1.1.3 and 6.2.2.3 (References 3 and 5, respectively), for a LOCA concurrent with a loss of offsite power, and minimum available DG power. The worst case single failure affecting the performance of the SX System is the failure of the Division 1 or 2 standby DG, which would in turn affect one SX subsystem. The SX flow assumed in the analyses is 5800 gpm per pump to the RHR heat exchanger. Reference 1 discusses SX System performance during these conditions. The operability of Division 1 and 2 of the SX System is required to ensure the effective operation of the RHR System in removing heat from the reactor, and the effective operation of other safety related equipment during a DBA or transient. In accordance with the TS 3.7.1 LCO, requiring both Division 1 and 2 subsystems to be Operable ensures that either the Division 1 or 2 subsystem will be available to provide adequate capability to meet cooling requirements of the equipment required for safe shutdown in the event of a single failure. A subsystem is considered Operable when the associated pump is Operable, and the associated piping, valves, instrumentation, and controls required to perform the safety related function are Operable.

Need for Amendment

As noted above, the current TS LCO 3.7.1 requires that the Division 1 and 2 SX subsystems be Operable in Modes 1, 2, and 3. TS LCO 3.7.1, Required Action B.1 states that with the Division

1 or 2 SX subsystem inoperable, the inoperable subsystem is required to be restored to Operable status in 72 hours. An extension of the CT to 7 days is needed to replace the Division 2 SX pump due to degrading performance. Currently, the Division 2 SX pump has demonstrated an adverse trend in pump differential pressure (DP). The pump performance over the last several years has been as expected. There has been a subtle decline in performance that's attributable to normal wear. However, the post-maintenance test (PMT) run following work in the Spring 2015 refueling outage (C1R15), performed on May 11, 2015, showed a step change decline in performance. The next performance run in July 2015 was also at the new degraded level. Review of test data from the July 2015 quarterly Division 2 SX pump run, indicates that the pump DP is nearing the Required Action Range. Based on the change in pump performance, a troubleshooting team was formed to evaluate the cause of the decline in pump performance and determine the appropriate course of action to correct the issue. The Division 2 SX pump is not currently exceeding any Inservice Testing (IST) requirements and remains fully capable of performing its specified safety function. Pump performance currently meets both design and IST acceptance limits.

It was subsequently determined that a preemptive replacement of the Division 2 SX pump is warranted to address the declining performance. Replacement of an SX pump is not a typical maintenance activity that could be performed within the 72 hour CT and planning estimates have indicated that completion of this evolution cannot be assured within the existing CT.

Risk Evaluation

The proposed TS changes have been evaluated using the risk-informed processes described in Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," dated May 2011 (Reference 6) and RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated May 2011 (Reference 7).

Reference 6 describes a risk-informed approach for assessing the nature and impact of proposed permanent licensing-basis changes by considering engineering issues and applying risk insights. This RG also provides risk acceptance guidelines for evaluating the results of such evaluations.

Reference 7 describes a risk-informed approach specifically for assessing proposed permanent TS changes in AOTs. This RG also provides risk acceptance guidelines for evaluating the results of such evaluations.

In implementing risk-informed decisionmaking under References 6 and 7, TS changes are expected to meet a set of five key principles. These principles include consideration of both traditional engineering factors (e.g., defense in depth and safety margins) and risk information. Attachment 5 provides the risk-informed evaluation of the proposed change in the SX CT that considers each one of these principles.

- The proposed change meets the current regulations unless it is explicitly related to a requested exemption.

- The proposed change is consistent with the defense-in-depth philosophy.

- The proposed change maintains sufficient safety margins.
- When proposed changes result in an increase in core damage frequency (CDF) or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.
- The impact of the proposed change should be monitored using performance measurement strategies.

The numeric results are summarized in the following table. Since this is a one-time change EGC did not report Delta CDF and Delta Large Early Release Frequency (LERF) values; that would normally be part of a permanent change. The results of the risk evaluation are compared in Table 1 with the risk acceptance guidelines described in Attachment 5. The values for the Incremental Conditional Core Damage Probability (ICCDP) and the Incremental Conditional Large Early Release Probability (ICLERP) demonstrate that the proposed one-time SX subsystem CT change has a small quantitative impact on plant risk.

Table 1
COMPARISON OF INDIVIDUAL HAZARD GROUP RESULTS
TO ACCEPTANCE GUIDELINES

Figure of Merit	Value	Acceptance Guideline	Below Acceptance Guideline
Internal Events and Internal Floods			
ICCDP	2.7E-07	<1.0E-06, or <1.0E-5[(1)]	Yes
ICLERP	6.3E-09	<1.0E-07, or <1.0E-6[(2)]	Yes
Internal Fires			
ICCDP	1.3E-06	<1.0E-06, or <1.0E-5[(1)]	Yes[(1)]
ICLERP	5.8E-08	<1.0E-07, or <1.0E-6[(2)]	Yes
Other Hazard Groups			
ICCDP	Negligible	<1.0E-06, or <1.0E-5[(1)]	Yes
ICLERP	Negligible	<1.0E-07, or <1.0E-6[(2)]	Yes
Total Values			
ICCDP	1.6E-6	<1.0E-06, or <1.0E-5[(1)]	Yes[(1)]
ICLERP	6.4E-8	<1.0E-07, or <1.0E-6[(2)]	Yes

(1) Per RG 1.177 a value between 1E-06 and 1E-05 may be deemed acceptable with effective compensatory measures implemented to reduce the sources of increased risk for a one-time change.

(2) Per RG 1.177 a value between 1E-07 and 1E-06 may be deemed acceptable with effective compensatory measures implemented to reduce the sources of increased risk for a one-time change.

Table 2 provides a summary of the approach and results of the evaluation of each of the potential risk contributors. These analyses demonstrate that the risk impact of the proposed one-time extension of the Division 2 SX CT is small and below the acceptance guidelines.

Table 2
SUMMARY OF RISK INSIGHTS FOR DIVISION 2 SX CT EXTENSION

RISK CONTRIBUTOR	APPROACH	INSIGHTS
Internal Events	Quantify ICCDP & ICLERP for planned configuration • ICCDP < 1E-6 • ICLERP < 1E-7 If exceeded compare to acceptance guidelines with risk management actions implemented to reduce sources of risk • ICCDP < 1E-5 • ICLERP < 1E-6	• Base risk within acceptance guidelines • Compensatory measures keep risk well within the acceptance guidelines
Internal Fire	Qualitatively and quantitatively evaluated: • Identify fire scenarios impacted by configuration • Estimate fire risk impacts due to configuration and quantify delta-CDF • Identify compensatory measures	• Internal events compensatory measures apply to fire scenarios • New fire-related compensatory measures identified
Seismic	Qualitatively evaluated.	• Seismic risk impacts negligible • Seismic risk reduced with compensatory measures for internal events
Other External Hazards	Qualitatively evaluate each hazard based on the CPS IPEEE and a re-examination for the specific configuration with SX B inoperable.	• Other External Event risks were found to be negligible contributors

Table 2
SUMMARY OF RISK INSIGHTS FOR DIVISION 2 SX CT EXTENSION

RISK CONTRIBUTOR	APPROACH	INSIGHTS
Overall At-Power Risks	Quantify ICCDP & ICLERP for planned configuration with normal work controls • ICCDP < 1E-6 • ICLERP < 1E-7 If exceeded compare to acceptance guidelines with risk management actions implemented to reduce sources of risk • ICCDP < 1E-5 • ICLERP < 1E-6	• Quantitative guidelines for normal work controls challenged, but acceptable with risk management actions implemented.

Regulatory Guide 1.177 specifies an approach and acceptance guidelines for the evaluation of plant licensing basis changes. RG 1.177 identifies a three-tiered approach for the evaluation of the risk associated with a proposed TS change as identified below:

- Tier 1 is an evaluation of the plant-specific risk associated with the proposed TS change, as shown by the change in CDF and ICCDP. Where applicable, containment performance should be evaluated on the basis of an analysis of LERF and ICLERP. The acceptance guidelines given in RG 1.177 for determining an acceptable permanent TS change are that the ICCDP and the ICLERP associated with the change should be less than 1E-06 and 1E-07, respectively.
- Tier 2 identifies and evaluates, with respect to defense-in-depth, any potential risk-significant plant equipment outage configurations associated with the proposed change. Reasonable assurance should be provided that risk-significant plant equipment outage configurations will not occur when equipment associated with the proposed TS change is out-of-service.
- Tier 3 provides for the establishment of an overall configuration risk management program (CRMP) and confirmation that its insights are incorporated into the decision-making process before taking equipment out-of-service prior to or during the AOT. Compared with Tier 2, Tier 3 provides additional coverage based on any additional risk significant configurations that may be encountered during maintenance scheduling over extended periods of plant operation. Tier 3 guidance can be satisfied by the Maintenance Rule (10 CFR 50.65(a)(4)), which requires an assessment and management of the increase in risk that may result from activities such as surveillance, testing, and corrective and preventive maintenance.

The risk analysis provided in Attachment 5 supports the Tier 1 element of RG 1.177, specifically the comparison of the results with the acceptance guidelines for ICCDP and ICLERP associated with changing a TS CT. The Tier 2 and Tier 3 elements are addressed below.

Tier 2: Avoidance of Risk-Significant Plant Configurations
The following compensatory measures all serve to lessen the calculated increase in the core damage risk when an SX subsystem is out-of-service.

The risk-informed evaluation identified a number of compensatory measures that will be implemented during the planned SX configuration to assure the risk impacts are acceptably low. These are discussed in detail in Attachment 5 and summarized below. The compensatory measures below are considered to be regulatory commitments and are summarized in Attachment 4.

The assessment of risk from internal events and internal fires did help to identify the following actions as important compensatory measures that will help to reduce the overall risk during the performance of the extended CT:

1. There will be no concurrent maintenance work on Division 1 and 3 mechanical or electrical equipment. Additionally, this equipment will be protected equipment for this one time outage as defined in EGC procedure OP-AA-108-117, "Protected Equipment Program," (Reference 14).
2. There will be no elective maintenance work on the Reserve Auxiliary Transformers (RATs) or Emergency Reserve Auxiliary Transformers (ERATs) or their Static VAR Compensators (SVCs) or concurrent switchyard work. Additionally, this equipment will be protected equipment for this one-time outage as defined in Reference 14.
3. Fire Risk Management Actions (RMAs) applicable for Division 2 SX subsystem and Division 2 SX subsystem header from CPS Risk Management document CL-CRM-14, Revision 2 will be completed in accordance with EGC Procedure OP-AA-201-012-1001, "Operations On-Line Fire Risk Management," (Reference 15).
4. The extended weather forecast will be examined to ensure severe weather conditions are not predicted prior to entry into the extended CT. In the event of an unforeseen severe weather condition due to rapidly changing conditions, such as severe high winds, a briefing with crew operators will be performed to reinforce operator actions and responses in the event of a loss of offsite power.
5. Shift briefs and pre-job walkdowns to reduce and manage transient combustibles prior to entrance into the extended CT will be used to alert the staff about the increased sensitivity to fires in the following fire zones (i.e., Table 3) during the extended Division 2 SX outage window. Additionally, any hot work activities in the following fire zones will be prohibited during the time within the extended Division 2 SX CT. The listed fire zones were identified based on the potential to cause a fire-induced loss of offsite power and/or risk significance in the FPRA results (i.e., generally zones with Division 1 equipment that impact containment heat removal).

Table 3
Affected Fire Zones

Fire Zone[(1)]	Fire Zone Description
A-2B	707-781 RHR A Equipment Room
A-2K	762 Non-Safety Switchgear East
A-2N	781 Div. 1 Switchgear Area
A-3D	762 Non-Safety Switchgear West
A-3F	781 Div. 2 Switchgear Area
CB-1F	762 General Access Area
CB-1I	825 Air Handling Equipment Area
CB-2	781 Div. 2 Cable Spreading Room
CB-3A	781 Auxiliary Electric Equipment Room
CB-4	781 Div. 1 Cable Spreading Room
CB-6A	800 Main Control Room Complex
R-1I	737 General Access & Shops
R-1P	762 General Access & Shops
R-1T	781 General Access Corridor
T-1F	737 General Access Area
T-1H	762 General Access & Equipment Area

(1) For larger fire zones, walkdowns may be focused on specific fire sensitive areas within the larger fire zones. Walkdowns are judged as not being required for areas with continuous operator occupation (e.g., the Main Control Room). Fire Risk Management Actions (RMAs) where they occur may address the need for walkdowns in some of these areas. ALARA principles apply when reviewing radiological areas such as RHR.

Since the first compensatory measure that will be taken while in the extended CT is that certain other PRA-modeled equipment will not be voluntarily taken out-of-service, risk-significant plant configurations are inherently avoided. Additionally, should an emergent condition arise such that plant equipment becomes unavailable, in addition to the planned out-of service equipment, the associated risk will be assessed and managed in accordance with the Tier 3 program discussed below.

In addition, although not credited in the PRA evaluation supporting the proposed CT extension, there is a cross-tie between the Divisions 1 and 2 SX subsystems which will be available for use

if conditions warrant it. Also, the site has FLEX equipment available to support plant activities if needed to mitigate a prolonged loss of plant cooling which is not credited in the PRA evaluation.

Tier 3: Risk-Informed Configuration Risk Management
Consistent with 10 CFR 50.65(a)(4), CPS has developed a CRMP governed by station procedures that ensures the risk impact of equipment out of service is appropriately evaluated prior to performing any maintenance activity. This program requires an integrated review to uncover risk-significant plant equipment outage configurations in a timely manner both during the work management process and for emergent conditions during normal plant operation. Appropriate consideration is given to equipment unavailability, operational activities like testing or load dispatching, and weather conditions. CPS currently has the capability to perform a configuration dependent assessment of the overall impact on risk of proposed plant configurations prior to, and during, the performance of maintenance activities that remove equipment from service. Risk is re-assessed if an equipment failure/malfunction or emergent condition produces a plant configuration that has not been previously assessed.

For planned maintenance activities, an assessment of the overall risk of the activity on plant safety, including benefits to system reliability and performance, is currently performed prior to scheduled work. The on-line assessment is controlled by EGC procedure WC-AA-101, "On-Line Work Control Process," and includes the following considerations:

- Maintenance activities that affect redundant and diverse structures, systems, and components (SSCs) that provide backup for the same function are minimized.
- The potential for planned activities to cause a plant transient are reviewed and work on SSCs that would be required to mitigate the transient are avoided.
- Work is not scheduled that is highly likely to exceed a TS or Operational Requirements Manual (i.e., a licensee controlled document containing requirements removed from the TS as part of conversion to the Improved Standard TS) completion time requiring a plant shutdown. For activities that are expected to exceed 50% of a TS Completion Time, compensatory measures and contingency plans are considered to minimize SSC unavailability and maximize SSC reliability.
- For Maintenance Rule Program High Risk Significant SSCs, the impact of the planned activity on the unavailability performance criteria is evaluated.
- As a final check, a quantitative risk assessment is performed to ensure that the activity does not pose any unacceptable risk. This evaluation is performed using the impact on both CDF and LERF. The results of the risk assessment are classified by a color code based on the increased risk of the activity as shown below.

Color	Meaning	Plant Impact and Required Action
Green	Non-risk significant	Small impact on plant risk Requires no specific actions
Yellow	Non-risk significant with non-quantitative factors applied	Impact on plant risk Limit unavailability time or take compensatory actions to reduce plant risk
Orange	Potentially risk-significant	Significant impact on plant risk Requires senior management review and approval prior to entering this condition Requires compensatory measures to reduce risk including contingency plans All entries will be of short duration
Red	Risk-significant	Not entered voluntarily If this condition occurs, immediate and significant actions taken to alleviate the problem

Emergent work is reviewed by shift Operations to ensure that the work does not invalidate the assumptions made during the work management process. EGC's risk management procedure has been implemented at CPS. This procedure defines the requirements for ensuring that the PRA model used to evaluate on-line maintenance activities is an accurate model of the current plant design and operational characteristics. Plant modifications and procedure changes are monitored, assessed, and dispositioned. Evaluation of changes in plant configuration or PRA model features are dispositioned by implementing PRA model changes or by the qualitative assessment of the impact of the change on the PRA assessment tool. Changes that have potential risk impact are recorded in an update requirements evaluations (URE) log for consideration in the next periodic PRA model update.

The reliability and availability of the SX pumps are monitored under the Maintenance Rule (MR) Program. If the pre-established reliability or availability performance criteria are exceeded for the SX pumps, they are considered for 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," paragraph (a)(1) actions, requiring increased management attention and goal setting in order to restore their performance (i.e., reliability and availability) to an acceptable level. The performance criteria are risk-based and, therefore, are a means to manage the overall risk profile of the plant. An accumulation of large core damage probabilities over time is precluded by the performance criteria.

The SX pumps (including the Division 2 SX pump) are all currently in the 10 CFR 50.65(a)(2) MR category (i.e., the SX pumps are meeting established performance goals). Replacement of the Division 2 SX pump is not anticipated to result in exceeding the current established MR criteria for the Division 2 SX pump.

Plant modifications and procedure changes are monitored, assessed and dispositioned. Evaluation of changes in plant configuration or PRA model features are dispositioned by implementing PRA model changes or by qualitatively assessing the impact of the changes on the CRMP assessment tool. Procedures exist for the control and application of CRMP

assessment tools, and include a description of the process when the plant configuration of concern is outside the scope of the CRMP assessment tool.

The goals of a CRMP are to ensure that risk significant plant configurations will not be inadvertently entered for planned maintenance activities, and appropriate actions will be taken should unforeseen events place the plant in a risk-significant configuration during the proposed extended Division 2 SX subsystem CT.

Conclusion

This request has been evaluated consistent with the key principles identified in RG 1.174 for risk informed changes to the licensing basis and demonstrates that the risk from the proposed change is acceptable small. The evaluation with respect to these principles is summarized below.

The proposed change meets the current regulations unless it is explicitly related to a requested exemption or rule change.

This LAR itself does not propose to deviate from existing regulatory requirements, and compliance with existing regulations is maintained by the proposed one time change to the plant's TS requirements.

The proposed change is consistent with the defense-in-depth philosophy.

The configuration to be entered decreases the redundancy of the SX system due to the removal of one of the three SX subsystems from service. The reduced redundancy increases the potential for the plant to lose SX cooling to plant equipment; however, the current plant design and supporting analyses demonstrate that the plant has much more capability to prevent and mitigate a loss of SX than credited in the original plant licensing basis.

Defense-in-depth is maintained during the configuration. Compensatory measures are identified to strengthen the level of defense-in-depth and reduce overall risk.

The proposed change maintains sufficient safety margins.

The proposed TS change is consistent with the principle that sufficient safety margins are maintained based on the following:

- Codes and standards (e.g., American Society of Mechanical Engineers (ASME), Institute of Electrical and Electronic Engineers (IEEE) or alternatives approved for use by the NRC). The proposed change is not in conflict with approved codes and standards relevant to the SX system.
- While in the proposed configuration, safety analysis acceptance criteria in the USAR are met, assuming there are no additional failures.

When proposed changes result in an increase in core damage frequency or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.

A risk evaluation was performed that considers the impact of the proposed change with respect to the risks due to internal events, internal fires, seismic events and other external hazards. The evaluation of the quantitative impacts of internal event risks due to the planned configuration demonstrate that the impact on the likelihood of core damage and large early release is well below the risk acceptance guideline. The fire evaluation determined that the impact on the likelihood of fire-related core damage is also below the risk acceptance guideline. In addition, recommended actions have been identified that further reduce the risk of the significant fire scenarios. The risk associated with seismic events and other external hazards are either not impacted by the change or are bounded by the risk from internal events.

The impact of the proposed change should be monitored using performance measurement strategies.

EGC's configuration risk management program will effectively monitor the risk of emergent conditions during the period of time that the proposed change is in effect. This will ensure that any additional risk increase due to emergent conditions is appropriately managed.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 50.36(c) provides that TS will include Limiting Conditions for Operation (LCOs) which are "the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee will shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met." The design of the CPS SX System must satisfy the requirements of 10 CFR 50.36, "Technical Specifications," paragraph (c)(2)(ii)(C), Criterion 3. These requirements state the following:

> (ii) A technical specification limiting condition for operation of a nuclear reactor must be established for each item meeting one or more of the following criteria:
>
> > (C) Criterion 3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The proposed changes involve extensions of the affected CT from 72 hours to 7 days. The LCOs themselves remain unchanged, as do the required remedial actions or shut down requirements in accordance with 10 CFR 50.36(c). Therefore, the proposed changes are consistent with current regulations.

Although not the direct subject matter of this requested amendment, the following 10 CFR 50, Appendix A, General Design Criteria apply to the SX System covered by the proposed changes in this amendment application.

CRITERION 17 - ELECTRIC POWER SYSTEMS

"An onsite electric power system and an offsite electric power system shall be provided to permit the functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

The onsite electric power supplies, including the batteries, and the onsite electric distribution system shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

Electric power from the transmission network to the onsite electric distribution system shall be supplied by two physically independent circuits (not necessarily on separate rights of way) designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A switchyard common to both circuits is acceptable. Each of these circuits shall be designed to be available in sufficient time following a loss of all onsite alternating current power supplies and the other offsite electric power circuit, to assure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits shall be designed to be available within a few seconds following a loss-of-coolant accident to assure that core cooling, containment integrity, and other vital safety functions are maintained. Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies."

CRITERION 34 - RESIDUAL HEAT REMOVAL

"A system to remove residual heat shall be provided. The system safety function shall be to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded. Suitable redundancy in components and features, and suitable interconnections, leak detection, and isolation capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure."

CRITERION 35 – EMERGENCY CORE COOLING

"A system to provide abundant emergency core cooling shall be provided. The system safety function shall be to transfer heat from the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts.

Suitable redundancy in components and features, and suitable interconnections, leak detection, isolation, and containment capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure."

CRITERION 38 - CONTAINMENT HEAT REMOVAL

"A system to remove heat from the reactor containment shall be provided. The system safety function shall be to reduce rapidly, consistent with the functioning of other associated systems, the containment pressure and temperature following any loss-of coolant accident and maintain them at acceptably low levels.

Suitable redundancy in components and features, and suitable interconnections, leak detection, isolation, and containment capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure."

CRITERION 44 - COOLING WATER

"A system to transfer heat from structures, systems, and components important to safety, to an ultimate heat sink shall be provided. The system safety function shall be to transfer the combined heat load of these structures, systems, and components under normal operating and accident conditions.

Suitable redundancy in components and features, and suitable interconnections, leak detection, and isolation capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure."

CPS USAR Section 3.1 (Reference 13) documents CPS compliance with the NRC GDC. There are no changes being proposed in this amendment application such that commitments to the regulatory requirements and guidance documents above would come into question. The assessment as documented in the USAR remains valid following implementation of the proposed extension of the TS CT for the Division 2 SX pump replacement.

4.2 Precedence

The NRC has previously reviewed requests for TS changes in support of one-time extensions of LCO completion times as documented in the following approved amendments.

On March 19, 2010, Exelon Generation Company, submitted a license amendment request proposing to extend the allowed outage time for the Suppression Pool Cooling mode of the Residual Heat Removal system, the Residual Heat Removal Service Water (RHRSW) system, the Emergency Service Water system, and the AC Sources from 72 hours to 7 days, under certain conditions, in order to allow for repairs of the RHRSW system piping. (Reference 8). The NRC approved amendments 203 and 165 for the Limerick Generating Stations Units 1 and 2, respectively, on July 29, 2011 (Reference 9).

On September 24, 2009, Exelon Generation Company, submitted a license amendment request proposing a one-time extension of the Completion time to restore a unit-specific Essential Service Water System train to Operable status from 72 hours to 144 hours (Reference 10). The NRC approved amendments 168 to Byron Station Unit 1 and Amendment 168 to Byron Station Unit 2 on April 9, 2010 (Reference 11).

4.3 No Significant Hazards Consideration

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," and 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (a)(6), Exelon Generation Company, LLC, (EGC) is requesting an exigent amendment to Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1. This exigent amendment request proposes a one-time extension of the Completion Time (CT) to restore the Division 2 Shutdown Service Water (SX) subsystem to Operable status associated with Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.7.1, "Division 1 and 2 Shutdown Service Water (SX) Subsystems and Ultimate Heat Sink (UHS)," from 72 hours to 7 days. This proposed change will only be used one time during a CPS planned Division 2 SX pump replacement scheduled for the week of October 26, 2015.

The current TS LCO 3.7.1, requires that the Division 1 and 2 SX subsystems be Operable in Modes 1, 2, and 3. TS LCO 3.7.1, Required Action B.1 states that with the Division 1 or 2 SX subsystem inoperable, the inoperable subsystem is to be restored to Operable status in 72 hours. An extension of the CT for one division of SX to be inoperable from 72 hours to 7 days is needed to preemptively replace the Division 2 SX pump due to degrading performance. This evolution is not a typical maintenance activity that can be performed within the existing 72 hour CT window and current planning estimates have indicated that this pump cannot be replaced within the current CT.

Replacement of the SX pump will be conducted during a planned system outage; however, due to the system configuration necessary to replace the degraded SX pump, the Division 2 SX subsystem will be declared inoperable putting CPS in a Condition with a 72 hour CT. Consequently, not being able to complete the Division 2 SX pump

replacement in the 72 hour CT would require CPS to be shutdown in accordance with TS 3.7.1, required Action C.1.

The proposed changes have been evaluated using the risk-informed processes described in Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," dated May 2011 and RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated May 2011. The risk associated with the proposed changes was shown to be acceptable.

According to 10 CFR 50.92, "Issuance of amendment," paragraph (c), a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) Involve a significant reduction in a margin of safety.

EGC has evaluated the proposed change to the TS for CPS, using the criteria in 10 CFR 50.92, and has determined that the proposed change does not involve a significant hazards consideration. The following information is provided to support a finding of no significant hazards consideration.

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed one-time change to the CT for CPS TS 3.7.1 will not increase the probability of an accident since it will only extend the time period that one SX subsystem can be out of service. The extension of the time duration that one SX subsystem is out of service has no direct physical impact on the plant. The proposed inoperable SX subsystem is normally in a standby mode while CPS is in Mode 1, 2, or 3 and is not directly supporting plant operation. Therefore, it can have no impact on the plant that would make an accident more likely to occur due to its inoperability. The proposed change does not adversely affect accident initiators or precursors, nor does it alter the design assumptions, conditions, or configuration of the facility or the manner in which the plant is operated and maintained.

   The previously analyzed accidents are initiated by the failure of plant structures, systems, or components. The SX system is not considered an initiator for any of these previously analyzed events. The proposed change does not have a detrimental impact on the integrity of any plant structure, system, or component

that initiates an analyzed event. No active or passive failure mechanisms that could lead to an accident are affected. The proposed change will not alter the operation of, or otherwise increase the failure probability of any plant equipment that initiates an analyzed accident. Therefore, the proposed change does not involve a significant increase in the probability of an accident previously evaluated.

The proposed change does not alter or prevent the ability of structures, systems, and components (SSCs) from performing their intended function to mitigate the consequences of an initiating event within the assumed acceptance limits. The proposed change does not require any physical change to any plant SSCs nor does it require any change in systems or plant operations. The proposed one-time increase in the CT is consistent with the philosophy of the current TS LCO which allows one SX subsystem to be inoperable for 72 hours. This change only extends the 72 hour CT to 7 days which has been shown to be acceptable from a risk perspective. The minimum equipment required to mitigate the consequences of an accident and/or safely shut down the plant will be Operable or available during the extended CT. The proposed change is consistent with the safety analysis assumptions and resultant consequences. Based on the above, the proposed change does not involve a significant increase in the consequences of an accident previously evaluated.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed changes do not involve the use or installation of new equipment and the currently installed equipment will not be operated in a new or different manner. No new or different system interactions are created and no new processes are introduced. The proposed changes will not introduce any new failure mechanisms, malfunctions, or accident initiators not already considered in the design and licensing bases. Based on this evaluation, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The proposed change does not alter any existing setpoints at which protective actions are initiated and no new setpoints or protective actions are introduced.

The design and operation of the SX system remains unchanged. The risk associated with the proposed increase in the time an SX pump is allowed to be inoperable was evaluated using the risk-informed processes described in RG 1.174 and RG 1.177. The risk was shown to be acceptable. Based on this evaluation, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, EGC concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of no significant hazards consideration is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

EGC has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, "Standards for Protection Against Radiation." However, the proposed amendment does not involve: (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22, "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," Paragraph (c)(9). Therefore, pursuant to 10 CFR 51.22, Paragraph (b), no environmental impact statement or environmental assessment needs be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. Clinton Power Station Updated Safety Analysis Report Section 9.2.1.2, "Shutdown Service Water System"

2. Clinton Power Station Updated Safety Analysis Report Table 9.2-3, "Ultimate Heat Sink Auxiliary Loads from the Shutdown Service Water System"

3. Clinton Power Station Updated Safety Analysis Report Section 6.2.1.1.3, "Design Evaluation" for Containment Structure

4. Clinton Power Station Updated Safety Analysis Report Chapter 15, "Accident Analyses"

5. Clinton Power Station Updated Safety Analysis Report Section 6.2.2.3, "Design Evaluation" for Containment Heat Removal Systems

6. Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Revision 2, dated May 2011

7. Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," Revision 1, dated May 2011

8. Letter from Pamela B. Cowan (Exelon Nuclear) to U. S. NRC, "License Amendment Request Proposed Changes to Technical Specifications Sections 3.5.1, 3.6.2.3, 3.7.1.1, 3.7.1.2, and 3.8.1.1 to Extend the Allowed Outage Times," dated March 19, 2010

9. Letter from U. S. NRC to Michael J. Pacilio (Exelon Nuclear), "Limerick Generating Station, units 1 and 2 – Issuance of Amendments Re: Allowed Outage Time Extensions to Support Residual Heat Removal Service Water Maintenance (TAC Nos. ME3551 and ME3552)," dated July 29, 2011

10. Letter from Patrick R. Simpson (Exelon Nuclear) to U. S. NRC, "License Amendment Request for a One-Time Extension of the Essential Service Water Train Completion Time," dated September 24, 2009

11. Letter from U. S. NRC to Charles G. Pardee (Exelon Nuclear), "Byron Station, Unit Nos. 1 and 2 – Issuance of Amendments RE: Extension of Essential Service Water Train Technical Specification Completion Time (TAC Nos. ME2293 and ME2294)," dated April 9, 2010

12. Clinton Power Station Updated Safety Analysis Report Section 8.3, "Onsite Power System"

13. Clinton Power Station Updated Safety Analysis Report Section 3.1, "Conformance with NRC General Design Criteria"

14. Exelon Generation Procedure OP-AA-108-117, "Protected Equipment Program"

15. Exelon Generation Procedure OP-AA-201-012-1001, "Operations On-Line Fire Risk Management"

ATTACHMENT 2

Proposed Technical Specification Pages for Clinton Power Station

3.7 PLANT SYSTEMS

3.7.1 Division 1 and 2 Shutdown Service Water (SX) Subsystems and Ultimate Heat Sink (UHS)

LCO 3.7.1 Division 1 and 2 SX subsystems and the UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. UHS water volume not within limit	A.1 Restore UHS water volume to within limit.	90 days
----------NOTE---------- **Not applicable during replacement of Division 2 SX pump during Fall 2015 Division 2 SX system outage window.** ---------- B. Division 1 or 2 SX subsystem inoperable.	----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," for diesel generator made inoperable by SX. 2. Enter applicable Conditions and Required Actions of LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," for RHR shutdown cooling subsystem made inoperable by SX. ---------- B.1 Restore SX subsystem to OPERABLE status.	72 hours

(continued)

Actions (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
----------NOTE---------- Only applicable during replacement of Division 2 SX pump during Fall 2015 Division 2 SX system outage window. ---------- C. Division 2 SX subsystem inoperable.	----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," for diesel generator made inoperable by SX. 2. Enter applicable Conditions and Required Actions of LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," for RHR shutdown cooling subsystem made inoperable by SX. ---------- C.1 Restore Division 2 SX subsystem to OPERABLE status.	7 Days
~~C~~D. Required Action and associated Completion Time of Condition B or C not met.	----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- ~~C~~D.1 Be in MODE 3.	12 hours
~~D~~E. Required Action and associated Completion Time of Condition A not met. OR Division 1 and 2 SX subsystems inoperable.	~~D~~E.1 Be in MODE 3. AND ~~D~~E.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify UHS water volume is ≥ 593 acre-ft.	In accordance with UHS Erosion, Sediment Monitoring, and Dredging Program
SR 3.7.1.2	Verify each required SX subsystem manual, power operated, and automatic valve in the flow path servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.1.3	Verify each SX subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program

ATTACHMENT 3

Proposed Technical Specification Bases Pages for Clinton Power Station
(For Information Only)

B 3.7 PLANT SYSTEMS

B 3.7.1 Division 1 and 2 Shutdown Service Water (SX) Subsystems and Ultimate Heat Sink (UHS)

BASES

BACKGROUND

The SX System is designed to provide cooling water for the removal of heat from unit auxiliaries, such as Residual Heat Removal (RHR) System heat exchangers, standby diesel generators (DGs), and room coolers for Emergency Core Cooling System equipment required for a safe reactor shutdown following a Design Basis Accident (DBA) or transient. The SX System also provides cooling to unit components, as required, during normal shutdown and reactor isolation modes. During a DBA, the equipment required for normal operation only is isolated from the SX System, and cooling is directed only to safety related equipment.

The SX System consists of three independent cooling water headers (Divisions 1, 2, and 3), and their associated pumps, piping, valves, and instrumentation. Any two SX pumps provide sufficient cooling capacity to support the required safety related systems during safe shutdown of the unit following a loss of coolant accident (LOCA).

The UHS consists of a portion of Clinton Lake which provides sufficient water inventory for all SX System post LOCA cooling requirements for a 30 day period with no external makeup water source available (Regulatory Guide 1.27, Ref. 1).

Cooling water is pumped from the UHS by the SX pumps to the essential components through the supply headers (Divisions 1, 2, and 3). After removing heat from the components, the water is discharged to the UHS where the heat is rejected.

The SX System supplies cooling water to equipment required for a safe reactor shutdown. Additional information on the design and operation of the SX System and UHS along with the specific equipment for which the SX System supplies cooling water is provided in the USAR, Section 9.2.1.2 and the USAR, Table 9.2-3 (Refs. 2 and 3, respectively). The SX System is designed to withstand a single active or passive failure,

(continued)

BACKGROUND (continued)

coincident with a loss of offsite power, without losing the capability to supply adequate cooling water to equipment required for safe reactor shutdown.

Following a DBA or transient, the SX System will operate automatically without operator action. Manual initiation of supported systems (e.g., suppression pool cooling) is, however, performed for long term cooling operations.

APPLICABLE SAFETY ANALYSES

The UHS is such that sufficient water inventory is available for all SX System post LOCA cooling requirements for a 30 day period with no additional makeup water source available (Ref. 1). The ability of the SX System to support long term cooling of the reactor or containment is assumed in evaluations of the equipment required for safe reactor shutdown presented in the USAR, Sections 9.2.1.2, 6.2.1.1.3.3, and Chapter 15, (Refs. 2, 4, and 5, respectively). These analyses include the evaluation of the long term primary containment response after a design basis LOCA. The Division 1 and 2 SX subsystems provide cooling water for the RHR suppression pool cooling mode to limit suppression pool temperature and primary containment pressure following a LOCA. This ensures that the primary containment can perform its intended function of limiting the release of radioactive materials to the environment following a LOCA. The Division 1 and 2 SX subsystems also provide cooling to other components assumed to function during a LOCA (e.g., RHR and Low Pressure Core Spray systems). Also, the ability to provide onsite emergency AC power is dependent on the ability of the SX System to cool the DGs.

The safety analyses for long term containment cooling were performed, as discussed in the USAR, Sections 6.2.1.1.3.3 and 6.2.2.3 (Refs. 4 and 6, respectively), for a LOCA, concurrent with a loss of offsite power, and minimum available DG power. The worst case single failure affecting the performance of the SX System is the failure of the Division 1 or 2 standby DGs, which would in turn affect one SX subsystem. The SX flow assumed in the analyses is 5800 gpm per pump to the RHR heat exchanger (USAR, Table 6.2-2, Ref. 7). Reference 2 discusses SX System performance during these conditions.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The SX System, together with the UHS, satisfy Criterion 3 of the NRC Policy Statement.

LCO

The OPERABILITY of Division 1 and Division 2 of the SX System is required to ensure the effective operation of the RHR System in removing heat from the reactor, and the effective operation of other safety related equipment during a DBA or transient. Requiring both Division 1 and 2 subsystems to be OPERABLE ensures that either the Division 1 or 2 subsystem will be available to provide adequate capability to meet cooling requirements of the equipment required for safe shutdown in the event of a single failure.

A subsystem is considered OPERABLE when:

a. The associated pump is OPERABLE; and

b. The associated piping, valves, instrumentation, and controls required to perform the safety related function are OPERABLE.

OPERABILITY of the UHS is based on a contained water volume of $\geq$ 593 acre-feet excluding sediment.

The isolation of the SX System to components or systems may render those components or systems inoperable, but may not affect the OPERABILITY of the associated SX subsystem.

OPERABILITY of the Division 3 SX subsystem is addressed by LCO 3.7.2, "Division 3 SX Subsystem."

APPLICABILITY

In MODES 1, 2, and 3, the UHS and the Division 1 and 2 subsystems of the SX System are required to be OPERABLE to support OPERABILITY of the equipment serviced by the Division 1 and 2 SX subsystems and the UHS and required to be OPERABLE in these MODES.

In MODES 4 and 5, the OPERABILITY requirements of the SX System and UHS are determined by the systems they support.

(continued)

BASES (continued)

ACTIONS

A.1

If the UHS is inoperable (i.e., the UHS water volume is not within the limit), action must be taken to restore the inoperable UHS to OPERABLE status within 90 days. The 90 day Completion Time is reasonable considering the time required to restore the required UHS volume, the margin contained in the available heat removal capacity, and the low probability of a DBA occurring during this period.

B.1

If the Division 1 or 2 SX subsystem is inoperable, it must be restored to OPERABLE status within 72 hours. With the unit in this condition, the remaining OPERABLE Division 1 or 2 SX subsystem is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE Division 1 or 2 SX subsystem could result in loss of the SX function. The 72 hour Completion Time was developed taking into account the redundant capabilities afforded by the OPERABLE subsystem and the low probability of a DBA occurring during this period.

Condition B is modified by a Note. The Note indicates that this Condition is not applicable during replacement of the Division 2 SX pump during the Fall 2015 Division 2 SX system outage window.

The Required Action is modified by two Notes indicating that the applicable Conditions of LCO 3.8.1, "AC Sources—Operating," and LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," be entered and the Required Actions taken if the inoperable SX subsystem results in an inoperable DG or RHR shutdown cooling subsystem, respectively. This is in accordance with LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1

During replacement of the Division 2 SX pump during the Division 2 SX system outage window in Fall 2015, the Division 2 SX subsystem is inoperable, and it must be restored to OPERABLE status within 7 days. This Completion Time is based upon a risk-informed assessment that concluded that the associated risk with the system in the specified configuration is acceptable.

Condition C is modified by a Note. The Note indicates that this Condition is only applicable during replacement of the Division 2 SX pump during the Division 2 system outage

(continued)

BASES

ACTIONS

C.1 (continued)

window in Fall 2015.

Required Action C.1 is modified by two Notes as described in Action B.1 above.

~~C~~D.1 ~~(continued)~~

If the Required Action and associated Completion Time of Condition B or C is not met, the plant must be brought to a condition in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 8) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Required Action ~~C~~D.1 is modified by a Note that prohibits the application of LCO 3.0.4.a. This Note clarifies the intent of the Required Action by indicating that it is not permissible under LCO 3.0.4.a to enter MODE 3 from MODE 4 with the LCO not met. While remaining in MODE 3 presents an acceptable level of risk, it is not the intent of the Required Action to allow entry into, and continue operation in, MODE 3 from MODE 4 in accordance with LCO 3.0.4.a. However, where allowed, a risk assessment may be performed in accordance with LCO 3.0.4.b. Consideration of the results of this risk assessment is required to determine the acceptability of entering MODE 3 from MODE 4 when this LCO is not met.

~~D~~E.1 and ~~D~~E.2

If the Required Action and associated Completion Time of Condition A or B are not met, or both Division 1 and 2 SX subsystems are inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the

(continued)

BASES (continued)

ACTIONS

E.1 and E.2 (continued)

required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

This SR verifies UHS water volume is ≥ 593 acre-feet (excluding sediment). The Surveillance Frequency is in accordance with UHS Erosion, Sediment Monitoring and Dredging Program.

With regard to UHS water volume values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 9).

SR 3.7.1.2

Verifying the correct alignment for each manual, power operated, and automatic valve in each Division 1 and 2 SX subsystem flow path provides assurance that the proper flow paths will exist for Division 1 and 2 SX subsystem operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position and yet considered in the correct position, provided it can be automatically realigned to its accident position within the required time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

Isolation of the SX subsystem to components or systems does not necessarily affect the OPERABILITY of the associated SX subsystem. As such, when all SX pumps, valves, and piping are OPERABLE, but a branch connection off the main header is isolated, the associated SX subsystem needs to be evaluated to determine if it is still OPERABLE. Alternatively, it is acceptable and conservative to declare an SX subsystem inoperable when a branch connection is isolated.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.1.3

This SR verifies that the automatic isolation valves of the Division 1 and 2 SX subsystems will automatically switch to the safety or emergency position to provide cooling water exclusively to the safety related equipment during an accident event. This is demonstrated by use of an actual or simulated initiation signal and is performed with the plant shut down. This SR also verifies the automatic start capability of the SX pump in each subsystem.
The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. Regulatory Guide 1.27, Revision 2, January 1976.
2. USAR, Section 9.2.1.2.
3. USAR, Table 9.2-3.
4. USAR, Section 6.2.1.1.3.3.
5. USAR, Chapter 15.
6. USAR, Section 6.2.2.3.
7. USAR, Table 6.2-2.
8. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.
9. Calculation IP-0-0095.

ATTACHMENT 4

Summary of Regulatory Commitments

Summary of Regulatory Commitments

The following table identifies commitments made in this document. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Implement the compensatory measures (items 1 through 5) listed in Attachment 1 of RS-15-246, Section 3.0, Tier 2 Discussion	Upon implementation of the one-time extension of the SX train Completion Time.	Yes	No

ATTACHMENT 5

Risk Assessment and Technical Adequacy of the PRA

(Contain Sensitive Information, has been removed)