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U.S. Nuclear Regulatory Commission
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Washington, DC 20555-0001

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
NRC Docket No. 50-333

Subkect: Response to Request for Supplemental Information by the Office of Nuclear Reactor Regulation to support Review of a License Amendment Request to Eliminate Selected Response Time Testing for Reactor Protection System and Primary Containment Isolation Instrumentation

Reference: 1. Letter from D. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request – Propose Change to Eliminate Selected Response Time Testing for Reactor Protection System and Primary Containment Isolation Instrumentation" (ML21291A110) dated October 18, 2021

By letter dated October 18, 2021, (Reference 1) Exelon Generation Company, LLC (Exelon) requested a change to the James A. FitzPatrick (JAF) Technical Specifications (TS) in accordance with 10 CFR 50.90. The proposed amendment request would eliminate selected Response Time Testing for Reactor Protection System and Primary Containment Isolation instrumentation.

Through telephone conversations with J. Poole, NRC Project Manager, and NRC staff between November 17, 2021 and November 19, 2021, the NRC communicated areas where additional information was necessary to validate the applicability of the technical justification provided in Reference 1.

The Attachment to this letter and the associated Enclosure contain the additional information necessary to validate the applicability of the technical justification. The information provided in this supplement is a more detailed description of the nomenclature used for the relays which are impacted by the request to eliminate selected Response Time Testing. Additionally, transposition errors from other documents into Reference 1 are being corrected to eliminate further confusion. These corrections are reflected in the Enclosure to this supplement. This information is not technical in nature.

Exelon has reviewed the information supporting a finding of no significant hazards consideration and the environmental consideration provided to the NRC in Reference 1.

The information attached to this letter does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. Furthermore, the information attached to this letter does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no commitments contained in this response.

If you should have any questions regarding this submittal, please contact Christian Williams at 610-765-5729.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 14th day of January 2022.

Respectfully,

David T. Gudger

David T. Gudger
Senior Manager, Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachment: SUPPLEMENTAL INFORMATION NEEDED J. A. FITZPATRICK LICENSE AMENDMENT REQUEST TO ELIMINATE SELECTED RESPONSE TIME TESTING FOR REACTOR PROTECTION SYSTEM AND PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION

Enclosure: Revision 1 to Reference 1 Enclosure: Description and Assessment

cc:	Regional Administrator – NRC Region I	w/ attachments
	NRC Senior Resident Inspector – JAF	"
	NRC Project Manager, NRR – JAF	"
	A. L. Peterson, NYSERDA	"

ATTACHMENT

SUPPLEMENTAL INFORMATION NEEDED J. A. FITZPATRICK LICENSE AMENDMENT REQUEST TO ELIMINATE SELECTED RESPONSE TIME TESTING FOR REACTOR PROTECTION SYSTEM AND PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
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By letter dated October 18, 2021, (Reference 1) Exelon Generation Company, LLC (Exelon) requested a change to the James A. FitzPatrick (JAF) Technical Specifications (TS) in accordance with 10 CFR 50.90. The proposed amendment request would eliminate selected Response Time Testing for Reactor Protection System and Primary Containment Isolation instrumentation.

Revised Instrument Model Names:

The technical justification for the elimination of selected Response Time Testing provided in Reference 1 is based on a BWR Owner's Group Licensing Topical report, NEDO-33291-A Supplement 1, which is listed as "Reference 3" in the Exelon request.

The applicability of the NEDO document is limited to the specific instrument types listed in the NEDO document. The Enclosure to Exelon's submittal, Reference 1, listed the name and type of some of the relays, but in some cases, the relay type was not specific enough to confirm the applicability of the NEDO document. Specifically, Tables 3.2.1-1, 3.2.2.-1, 3.2.3-1, 3.2.4-1 and 3.2.5-1 each list the equipment and models for the instrumentation being tested. The model description for both the Logic Relays and Output Relays do not specifically identify the models installed in the system, but rather include the generic names "HFA" (for logic relays and some output relays) or "RPS SCRAM Contactor" (for the remaining output relays).

The affected tables have been updated and are included in a revision to Enclosure 1 of the original submittal. Enclosure 1 of this supplement should replace the original Enclosure 1 in its entirety.

Correction of Transposition Errors:

In the original submittal, Exelon made the following statement in five (5) places of the original Enclosure; "These components arranged as shown on the loop drawings and schematics listed in Section 4 (or 5) match the "Loop Type H (or E)" as described in Section 6.2 of NEDO-32291-A."

This reference to Section 4 or 5 is a carryover reference to Section 4 or 5 of documents that are not part of the submittal. The referenced Sections list plant drawings which demonstrate that the component arrangement is the same as the applicable type (H or E) described in NEDO-32291-A Supplement 1. These drawings have been added to the list of Enclosure References as references 8 thru 25. The associated statements have been revised to refer directly to the Enclosure References. As discussed above, the References section of Enclosure 1 included with this supplement should replace the Reference Section of the original Enclosure 1.

ENCLOSURE Revision 1

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
NRC Docket No. 50-333

Evaluation of Proposed Changes

Subject: Request for Technical Specification Changes to Eliminate Selected Response Time Testing Requirements

1.0 SUMMARY DESCRIPTION

2.0 DETAILED DESCRIPTION

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1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, Exelon Generation Company, LLC (Exelon), requests the following amendment to Appendix A, Technical Specifications (TS), of Renewed Facility Operating License No. DPR-59 for James A. FitzPatrick Nuclear Power Plant (JAF).

The proposed changes would modify the TS to eliminate the response time testing (RTT) requirements for TS Section 3.3.1.1, “Reactor Protection System (RPS) Instrumentation,” Reactor Pressure – High function, Reactor Vessel Water Level – Low (Level 3) function and TS Section 3.3.6.1, "Primary Containment Isolation Instrumentation" Reactor Vessel Water Level – Low Low Low (Level 1) function, Main Steam Line Pressure – Low function and Main Steam Line Flow – High function. The proposed changes are consistent with the BWR Owner’s Group Licensing Topical report (Reference 5) as approved by the Nuclear Regulatory Commission (NRC) (Reference 6).

Elimination of the response time testing requirements will result in significant improvement in plant safety by: (1) minimizing the time when safety systems are out of service or otherwise incapable of responding to a degraded plant condition; (2) reducing the potential for inadvertent essential safety function (ESF) actuations; (3) reducing the complexity of refuel outages and thus reducing shutdown risk; (4) reducing personnel radiation exposure; and, (5) allowing critical personnel to be used for more significant tasks.

2.0 DETAILED DESCRIPTION

2.1 TS Section 3.3.1.1, Table 3.3.1.1-1 Function 3, “Reactor Pressure – High” specifies SR 3.3.1.1.15 as applicable to this function. Function 3 is being revised to delete the applicability of SR 3.3.1.1.15.

2.2 TS Section 3.3.1.1, Table 3.3.1.1-1 Function 4, “Reactor Vessel Water Level – Low (Level 3)” specifies SR 3.3.1.1.15 as applicable to this function. Function 4 is being revised to delete the applicability of SR 3.3.1.1.15.

2.3 TS Section 3.3.6.1, Table 3.3.6.1-1 Function 1.a, "Reactor Vessel Water Level - Low Low Low, (Level 1)" specifies SR 3.3.6.1.8 as applicable to this function. Function 1.a is being revised to delete the applicability of SR 3.3.6.1.8.

2.4 TS Section 3.3.6.1, Table 3.3.6.1-1 Function 1.b, "Main Steam Line Pressure - Low," specifies SR 3.3.6.1.8 as applicable to this function. Function 1.b is being revised to delete the applicability of SR 3.3.6.1.8.

2.5 TS Section 3.3.6.1, Table 3.3.6.1-1 Function 1.c, "Main Steam Line Flow - High," specifies SR 3.3.6.1.8 as applicable to this function. Function 1.b is being revised to delete the applicability of SR 3.3.6.1.8.

2.6 Surveillance Requirement (SR) 3.3.6.1.8 is deleted in its entirety as the above referenced functions are the only Primary Containment Isolation Instrumentation functions to which SR 3.3.6.1.8 apply.

In addition, the TS Bases will be revised to reflect the above proposed changes.

3.0 TECHNICAL EVALUATION

3.1 Background:

In January 1994, the Boiling Water Reactor Owners' Group {BWROG) issued Licensing Topical Report (LTR) NEDO-32291 (Reference 3). In this LTR. The BWROG proposed eliminating the requirements for performance of Response Time Testing (RTT) of selected instrumentation in the RPS, Emergency Core Cooling System (ECCS), and Isolation Actuation Signal (IAS). The NRC approved the LTR in an SER dated December 28, 1994 (Reference 4). Reference 3 established a generic basis for elimination of selected RTT requirements for instrument loops that had good performance histories and longer response time requirements. The result of this effort was a significant reduction of testing which was shown by the study to be unnecessary.

By letter dated May 30, 1996, JAF (then part of the Power Authority of the State of New York (PASNY)) proposed an amendment to its TS to eliminate selected response time testing (RTT) requirements for certain sensors and specified loop instrumentation (Reference 1). The proposed changes were supported by analyses performed by the Boiling Water Reactor Owners Group (BWROG) Topical Report. This request was approved by the Nuclear Regulatory Commission (NRC) on October 28, 1996 (Reference 2).

The BWROG subsequently issued Supplement 1 to Reference 3 on November 4, 1997 (Reference 5). The LTR supplement documents the results of the second phase of the BWROG Response Time Testing Committee's study to identify ways to further eliminate RTT requirements. With only a few exceptions, the study results documented in Reference 5 cover all RPS and IAS instrumentation loops with response time requirements in the intermediate response time range (i.e., 300 to 5000 msec) that were not considered in the first phase of the study documented in Reference 3. This generic LTR Supplement documented an analysis to extend the conclusions of the original study to cover logic components in selected instrumentation loops to demonstrate that elimination of the RTT requirements for the logic portions of those loops is of no safety significance. In Reference 6, the NRC documented their review of Reference 5 and the determination that the LTR Supplement provided an acceptable basis for eliminating selected RTT from TS for the instruments/components identified in the supplement.

3.2 Justification

Consistent with Reference 3, the supplement to NEDO-32291-A (Reference 1) utilized the requirements of Institute of Electrical and Electronics Engineers (IEEE) Standard 338-1977, "Criteria for Periodic Testing of Nuclear Power Generating Station Safety Systems," as endorsed by NRC Regulatory Guide 1.118, "Periodic Testing of Electric Power and Protection Systems," which states the following:

> "Response time testing of all safety-related equipment, per se, is not required if, in lieu of response time testing, the response time of the safety equipment is verified by functional testing, calibration checks or other tests, or both. This is acceptable if it can be demonstrated that changes in response time beyond acceptable limits are accompanied by changes in performance characteristics which are detectable during routine periodic tests."

The analysis contained in Reference 3 provides the basis for eliminating selected response time testing requirements. The analysis was performed for BWRs, and its applicability to JAF has been verified with regards to the proposed TS changes. JAF participated in the development of Reference 3 as documented in Appendix A of the NEDO document.

The BWROG analysis includes the identification of potential failure modes of components in the affected instrumentation loops that could potentially impact the instrument loop response time. In addition, plant operating experiences were reviewed to identify response time failures and how they were detected. The failure modes identified were evaluated to determine if the effect on response time would be detected by other testing requirements contained in the TS.

The results of the BWROG analysis demonstrate that any credible failure of the instrument loop components would either be bounded by a bounding response time (BRT) or would be detected by other TS testing requirements, such as a channel calibration, channel check, channel functional test, or logic system functional test. These other testing requirements are sufficient to identify failure modes or degradations in instrument response times and assure operation of the analyzed instrument loops are within acceptance limits. Furthermore, the BWROG has described various defense in depth issues (Reference 1) which clearly demonstrate that from a realistic basis, there is no safety significance even if instrumentation loop response times are significantly longer than the loop BRTs. Therefore, potential errors in the conclusions of the analysis and BRTs resulting from unanticipated failure modes of components do not affect the overall conclusion that elimination of the identified response time testing requirements has no substantial detrimental impact on plant safety.

A review of utility-supplied information for the loops included in the Reference 1 study was performed to identify the individual components comprising each of the instrument loops. Components with sufficiently similar design and construction features were grouped together into a component set for which a common Failure Modes and Effects Analysis (FMEA) was performed.

The BWROG utilized the results of the FMEAs, in conjunction with industry failure experience and component specifications, requirements, and performance test results, to establish a BRT. The BRT is the maximum response time expected for any component in the set that could result from credible “undetected" component failures or degradation. Undetected component failures and degradations as used in Reference 1 are failures and degradations that are not expected to be detected either by immediate trip or by periodic surveillance actions other than response time testing. Response time increases up to the BRT may go undetected, but it is expected that any failure or degradation that results in a response time larger than the BRT will be detected by one or more surveillance actions other than response time testing. The BRT is established based on the assumption that specific RTT is not performed for the loop or component.

The BRT for each evaluated channel is determined by the summation of the individual component responses in the trip system actuation logic. In accordance with Reference 1 Section 8.5.1, the limiting BRT for the sensors is derived from the current RTT acceptance criteria. This value plus the sum of the channel relay BRTs is then compared to the current RTT limit required by the applicable RTT surveillance procedure.

JAF analyzed the functions stated below to confirm the applicability of NEDO-32291-A Supplement 1. The functions/loops analyzed are as a follow:

- Reactor Pressure – High
- Reactor Vessel Water Level Low – Level 3
- Reactor Vessel Water Level Low Low Low – Level 1

- Main Steam Line Pressure – Low
- Main Steam Line Flow – High

The following equipment requirements are applicable to all five (5) sections below.

Equipment Requirements

NEDO-32291-A Supplement 1 lists the following requirements for the usage of the Bounding Response Time data for removal of the RTT from the Technical Specifications and Technical Specification Bases:

Rosemount 510DU and 710DU Trip Units must meet the following requirements:

- The trip units are procured by the utility as nuclear safety related or dedicated for nuclear safety related application under a utility dedication program.

Agastat EGPB relays must meet the following requirements:

- Prior to installation or after any maintenance or repair of the relays, the normally open contacts of the relay are confirmed to open in 70 milliseconds or less after power is removed from the coil.
- The relays are within their qualified life.
- The relays are procured by the utility as nuclear Safety Related or dedicated for nuclear Safety Related application under a utility dedication program.

GE HFA Relays must meet the following requirements

- The HFA manufacturer's instructions are followed for setup and adjustment of the relay prior to the initial operation and after any repair or maintenance
- Prior to installation or after any maintenance or repair of the relays, the normally open contacts of the relays are confirmed to open in 20 milliseconds or less after power is removed from the coil.
- The relays are procured by the utility as nuclear Safety Related or dedicated for nuclear Safety Related application under a utility dedication program.

For SCRAM Contactors:

- The plant performs the APRM upscale SCRAM trip RTT with a loop acceptance criterion of 90 milliseconds maximum AND the APRM RTT includes the APRM electronics and at least one interposing relay, not shared by the other loops, between the APRM output and the RPS SCRAM contactor.

  OR

- If the APRM RTT is completed in phases, the maximum undetected response time of the SCRAM contactors is 45 milliseconds, provided the acceptance criteria is 50 milliseconds maximum for that phase that includes the SCRAM contactor and at least one interposing relay not shared by the other loops.

3.2.1 REACTOR PRESSURE – HIGH

The Reactor Pressure High sensors provide input to the RPS Scram Contactors when the pressure in the reactor rises above the determined setpoint. Equipment in the Reactor Pressure loops are listed in Table 3.2.1-1 below.

Revised Table 3.2.1-1: Reactor Pressure Loop Equipment and Models

Sensor	MTU	TU Output Relay	Logic Relay	Output Relay
02-3PT-55A	02-3MTU-255A (Rosemount 710DU)	05A-K101A (Agastat EGPB)	05A-K5A (12HFA151A9)	05A-K14A/E (RPS SCRAM Contactor GE CR105)
02-3PT-55B	02-3MTU-255B (Rosemount 710DU)	05A-K101B (Agastat EGPB)	05A-K5B (12HFA151A9)	05A-K14B/F (RPS SCRAM Contactor GE CR105)
02-3PT-55C	02-3MTU-255C (Rosemount 710DU)	05A-K101C (Agastat EGPB)	05A-K5C (15HFA151A9)	05A-K14C/G (RPS SCRAM Contactor GE CR105)
02-3PT-55D	02-3MTU-255D (Rosemount 710DU)	05A-K101D (Agastat EGPB)	05A-K5D (15HFA151A9)	05A-K14D/H (RPS SCRAM Contactor GE CR105)

The components in these loops have been analyzed in NEDO-32291-A Supplement 1. See Section 6.1 of NEDO-32291-A Supplement 1 for details.

These components arranged as shown on the loop drawings and schematics listed in References 8 thru 15 match the “Loop Type H” as described in Section 6.2 of NEDO-32291-A.

Since the equipment installed in the plant matches the NEDO analyzed configuration, the plant procedures may be compared to the NEDO procedures to determine if they can be applied directly, or if modifications are required to implement the results of the report.

Bounding Response Time

The Bounding Response Time (BRT) for a component is the maximum response time that could result from credible, undetected, component failures or degradation. Per NEDO-32291-A Supplement 1, these failures or degradation are not expected to be detectable by any actions other than period Response Time Testing. Failures that result in a response time higher than the BRT are considered detectable by periodic surveillance other than the RTT. The BRT for each component type has been determined in NEDO-32291-A Supplement 1 via FMEA, component specifications, and industry experience. In order to use the determined BRTs, certain procedural requirements must be met. See Section 3.2 for Equipment Requirements.

Table 3.2.1-2: Selected Equipment BRT from NEDO-32291-A, Supplement 1

Component Set	Abbreviation	Bounding Response Time
Agastat Relays	Agastat	140 milliseconds
GE HFA Relays	HFA	40 milliseconds
Trip Units	TU	24 milliseconds
RPS SCRAM Contactor	Contactor	45 milliseconds

The BRTs for each component in the loop may be combined together to calculate a BRT for the entire loop logic. Loop type and Loop Logic BRT are taken from NEDO-32291-A Supplement 1, Table 6-2.

Table 3.2.1-3: Selected Loop BRT from NEDO-32291-A, Supplement 1

Loop Type	Trip Unit	TU Output Relay	Logic Relay	Output Relay	Loop Logic BRT
H	TU (24 ms)	Agastat (140 ms)	HFA (40 ms)	Contactor (45 ms)	249 ms

The difference between the loop maximum allowable response time and the Loop Logic BRT above is considered the maximum allowable Loop Sensor BRT. If the Loop Sensor has a lower BRT than this difference, then the entire loop response time requirements will be met without performance of periodic RTT. For the RPS Reactor Vessel Pressure - High Loops, the required response time of the trip equipment is 550 milliseconds per the JAF Final Safety Analysis Report (FSAR) Table 7.2-5. Note 3 on this table states the following regarding the response time: “Sensor is eliminated from response time testing for the RPS actuation logic circuits. Response time testing and conformance to the test acceptance criteria for the remaining channel components includes trip unit and relay logic.”

Based on the information above, the sensor BRT is calculated as (550 – 249) = 301 milliseconds.

The sensor for the Reactor Pressure loops is a Rosemount 1153 transmitter that has a BRT of 200 milliseconds per ISP-104A/B. This sensor BRT was determined previously when JAF submitted a Technical Specification (TS) amendment to remove RTT for the sensors of the loops considered in this report under NEDO-32291-A. See JAF TS amendment 235 for additional details. As the sensor BRT is lower that the allowable sensor BRT, NEDO-32291-A Supplement 1 allows us to conclude that surveillance tests other than RTT are sufficient to ensure that the FSAR listed loop response time requirements are met.

3.2.2 REACTOR WATER LEVEL LOW – LEVEL 3:

The Reactor Water Level Low – Level 3 sensors provide input to the RPS Scram Contactors when the water level in the reactor drops below the Level 3 setpoint. Equipment in the Reactor Water Level 3 loops are listed in Table 3.2.2-1 below.

Revised Table 3.2.2-1: Reactor Water Level 3 Equipment and Models

Sensor	MTU	TU Output Relay	Logic Relay	Output Relay
02-3LT-101A	02-3MTU-201A (Rosemount 710DU)	05A-K102A (Agastat EGPB)	05A-K6A (12HFA151A9)	05A-K14A/E (RPS SCRAM Contactor GE CR105)
02-3LT-101B	02-3MTU-201B (Rosemount 710DU)	05A-K102B (Agastat EGPB)	05A-K6B (12HFA151A9)	05A-K14C/G (RPS SCRAM Contactor GE CR105)
02-3LT-101C	02-3MTU-201C (Rosemount 710DU)	05A-K102C (Agastat EGPB)	05A-K6C (12HFA151A9)	05A-K14B/F (RPS SCRAM Contactor GE CR105)
02-3LT-101D	02-3MTU-201D (Rosemount 710DU)	05A-K102D (Agastat EGPB)	05A-K6D (12HFA151A9)	05A-K14D/H (RPS SCRAM Contactor GE CR105)

The components in these loops have been analyzed in NEDO-32291-A Supplement 1. See Section 6.1 of NEDO-32291-A Supplement 1 for details.

These components arranged as shown on the loop drawings and schematics listed in References 8 thru 15 match the “Loop Type H” as described in Section 6.2 of NEDO-32291-A.

Since the equipment installed in the plant matches the NEDO analyzed configuration, the plant procedures may be compared to the NEDO procedures to determine if they can be applied directly, or if modifications are required to implement the results of the report.

Bounding Response Time

The Bounding Response Time (BRT) for a component is the maximum response time that could result from credible, undetected, component failures or degradation. Per NEDO-32291-A Supplement 1, these failures or degradation are not expected to be detectable by any actions other than period Response Time Testing. Failures that result in a response time higher than the BRT are considered detectable by periodic surveillance other than the RTT. The BRT for each component type has been determined in NEDO-32291-A Supplement 1 via FMEA, component specifications, and industry experience. In order to use the determined BRTs, certain procedural requirements must be met. See Section 3.2 for Equipment Requirements.

Table 3.2.2-2: Selected Equipment BRT from NEDO-32291-A, Supplement 1

Component Set	Abbreviation	Bounding Response Time
Agastat Relays	Agastat	140 milliseconds
GE HFA Relays	HFA	40 milliseconds
Trip Units	TU	24 milliseconds
RPS SCRAM Contactor	Contactor	45 milliseconds

The BRTs for each component in the loop may be combined together to calculate a BRT for the entire loop logic. Loop type and Loop Logic BRT are taken from NEDO-32291-A Supplement 1, Table 6-2.

Table 3.2.2-3: Selected Loop BRT from NEDO-32291-A, Supplement 1

Loop Type	Trip Unit	TU Output Relay	Logic Relay	Output Relay	Loop Logic BRT
H	TU (24 ms)	Agastat (140 ms)	HFA (40 ms)	Contactor (45 ms)	249 ms

The difference between the loop maximum allowable response time and the Loop Logic BRT above is considered the maximum allowable Loop Sensor BRT. If the Loop Sensor has a lower BRT than this difference, then the entire loop response time requirements will be met without performance of periodic RTT. For the RPS Reactor Water Level – Level 3 Loops, the required response time of the trip equipment is 1050 milliseconds per the JAF FSAR Table 7.2-5. Note 3 on this table states the following regarding the response time: “Sensor is eliminated from response time testing for the RPS actuation logic circuits. Response time testing and conformance to the test acceptance criteria for the remaining channel components includes trip unit and relay logic.”

Based on the information above, the sensor BRT is calculated as (1050 – 249) = 801 milliseconds.

The sensor for the Reactor Water Level loops is a Rosemount 1153 transmitter that has a BRT of 500 milliseconds per ISP-102A/B. This sensor BRT was determined previously when JAF submitted a Technical Specification amendment to remove RTT for the sensors of the loops considered in this report under NEDO-32291-A. See JAF TS amendment 235 for additional details. As the sensor BRT is lower that the allowable sensor BRT, NEDO-32291-A Supplement 1 allows us to conclude that surveillance tests other than RTT are sufficient to ensure that the FSAR listed loop response time requirements are met.

3.2.3 MAIN STEAM FLOW – HIGH

Loop Equipment

The Main Steam Line Flow sensors provide input to the MSIV closure logic when the steam flow rate rises above the flow setpoint. Equipment in the MSIV Steam Flow loops are listed in Table 3.2.3-1 below.

Revised Table 3.2.3-1: Main Steam Flow Loop Equipment and Models

Sensor	MTU	TU Output Relay	Logic Relay	Output Relay
02DPT-116A	02MTU-216A (Rosemount 710DU)	05A-K113A (Agastat EGPB)	16A-K3A (12HFA151A9)	16A-K7A (12HFA151A9)
02DPT-117A	02MTU-217A (Rosemount 710DU)	05A-K114A (Agastat EGPB)	16A-K3A (12HFA151A9)	16A-K7A (12HFA151A9)
02DPT-118A	02MTU-218A (Rosemount 710DU)	05A-K115A (Agastat EGPB)	16A-K3A (12HFA151A9)	16A-K7A (12HFA151A9)
02DPT-119A	02MTU-219A (Rosemount 710DU)	05A-K116A (Agastat EGPB)	16A-K3A (12HFA151A9)	16A-K7A (12HFA151A9)
02DPT-116B	02MTU-216B (Rosemount 710DU)	05A-K113B (Agastat EGPB)	16A-K3B (12HFA151A9)	16A-K7B (12HFA151A9)
02DPT-117B	02MTU-217B (Rosemount 710DU)	05A-K114B (Agastat EGPB)	16A-K3B (12HFA151A9)	16A-K7B (12HFA151A9)
02DPT-118B	02MTU-218B (Rosemount 710DU)	05A-K115B (Agastat EGPB)	16A-K3B (12HFA151A9)	16A-K7B (12HFA151A9)
02DPT-119B	02MTU-219B (Rosemount 710DU)	05A-K116B (Agastat EGPB)	16A-K3B (12HFA151A9)	16A-K7B (12HFA151A9)
02DPT-116C	02MTU-216C (Rosemount 710DU)	05A-K113C (Agastat EGPB)	16A-K3C (12HFA151A9)	16A-K7C (12HFA151A9)
02DPT-117C	02MTU-217C (Rosemount 710DU)	05A-K114C (Agastat EGPB)	16A-K3C (12HFA151A9)	16A-K7C (12HFA151A9)
02DPT-118C	02MTU-218C (Rosemount 710DU)	05A-K115C (Agastat EGPB)	16A-K3C (12HFA151A9)	16A-K7C (12HFA151A9)
02DPT-119C	02MTU-219C (Rosemount 710DU)	05A-K116C (Agastat EGPB)	16A-K3C (12HFA151A9)	16A-K7C (12HFA151A9)
02DPT-116D	02MTU-216D (Rosemount 710DU)	05A-K113D (Agastat EGPB)	16A-K3D (12HFA151A9)	16A-K7D (12HFA151A9)
02DPT-117D	02MTU-217D (Rosemount 710DU)	05A-K114D (Agastat EGPB)	16A-K3D (12HFA151A9)	16A-K7D (12HFA151A9)
02DPT-118D	02MTU-218D (Rosemount 710DU)	05A-K115D (Agastat EGPB)	16A-K3D (12HFA151A9)	16A-K7D (12HFA151A9)
02DPT-119D	02MTU-219D (Rosemount 710DU)	05A-K116D (Agastat EGPB)	16A-K3D (12HFA151A9)	16A-K7D (12HFA151A9)

The components in these loops have been analyzed in NEDO-32291-A Supplement 1. See Section 6.1 of NEDO-32291-A Supplement 1 for details on the analyzed equipment types.

These components arranged as shown on the loop drawings listed in the References 8 thru 15 match the “Loop Type E” as described in Section 6.2 of NEDO-32291-A Supplement 1.

Since the equipment installed in the plant matches the NEDO analyzed configuration, the plant procedures may be compared to the NEDO procedures to determine if they can be applied directly, or if modifications are required to implement the results of the report.

Bounding response Time

The Bounding Response Time (BRT) for a component is the maximum response time that could result from credible, undetected, component failures or degradation. Per NEDO-32291-A Supplement 1, these failures or degradation are not expected to be detectable by any actions other than periodic RTT. Failures that result in a response time higher than the BRT are considered detectable by periodic surveillance other than the RTT. The BRT for each component type has been determined in NEDO-32291-A Supplement 1 via Failure Modes and Effects Analysis (FMEA), component specifications, and industry experience. In order to use the determined BRTs, certain procedural requirements must be met. See Section 3.2 for Equipment Requirements.

Table 3.2.3-2: Selected Equipment BRT from NEDO-32291-A, Supplement 1

Component Set	Abbreviation	Bounding Response Time
Agastat Relays	Agastat	140 milliseconds
GE HFA Relays	HFA	40 milliseconds
Trip Units	TU	24 milliseconds

The BRTs for each component in the loop may be combined together to calculate a BRT for the entire loop logic. Loop type and Loop Logic BRT are taken from NEDO-32291-A Supplement 1, Table 6-2.

Table 3.2.3-3: Selected Loop BRT from NEDO-32291-A, Supplement 1

Loop Type	Trip Unit	TU Output Relay	Logic Relay	Output Relay	Loop Logic BRT
E	TU (24 ms)	Agastat (140 ms)	HFA (40 ms)	HFA (40 ms)	244 ms

The difference between the loop maximum allowable response time and the Loop Logic BRT above is considered the maximum allowable Loop Sensor BRT. If the Loop Sensor has a smaller BRT than this difference, then the entire loop response time requirements will be met without periodic RTT.

For the MSIV Main Steam Flow - High Loops, the required response time of the trip equipment is 2500 milliseconds per the JAF Final Safety Analysis Report (FSAR) Table 7.3-12. The Note on this table states the following regarding the response time:

“Sensor is eliminated from response time testing for the MISV actuation logic circuits. Response time testing and conformance to the test acceptance criteria for the remaining channel components includes trip unit and relay logic.”

Based on the information above, the sensor BRT is calculated as (2500 – 244) = 2256 milliseconds.

The sensor for the Steam Flow loops is a Rosemount 1153 transmitter that has a BRT of 700 milliseconds per ISP-106A/B. This sensor BRT was determined previously when JAF submitted a TS amendment to remove RTT for the sensors of the loops considered in this report under NEDO-32291-A. See JAF TS amendment 235 for additional details.

As the sensor BRT is lower that the allowable sensor BRT, NEDO-32291-A Supplement 1 allows us to conclude that surveillance tests other than RTT are sufficient to ensure that the FSAR listed loop response time requirements are met.

3.2.4 MAIN STEAM PRESSURE - LOW

Loop Equipment

The Main Steam Pressure Low sensors provide input to the MSIV closure logic when the pressure in the main steam lines drops below the setpoint. Equipment in the Main Steam Pressure - Low loops are listed in Table 3.2.4-1 below.

Revised Table 3.2.4-1 Main Steam Pressure – Low Equipment and Models

Sensor	MTU	TU Output Relay	Logic Relay	Output Relay
02PT-134A	02MTU-234A (Rosemount 710DU)	05A-K121A (Agastat EGPB)	16A-K4A (12HFA151A9)	16A-K7A (12HFA151A9)
02PT-134B	02MTU-234B (Rosemount 710DU)	05A-K121B (Agastat EGPB)	16A-K4B (12HFA151A9)	16A-K7B (12HFA151A9)
02PT-134C	02MTU-234C (Rosemount 710DU)	05A-K121C (Agastat EGPB)	16A-K4C (12HFA151A9)	16A-K7C (12HFA151A9)
02PT-134D	02MTU-234D (Rosemount 710DU)	05A-K121D (Agastat EGPB)	16A-K4D (12HFA151A9)	16A-K7D (12HFA151A9)

The components in these loops have been analyzed in NEDO-32291-A Supplement 1. See Section 6.1 of NEDO-32291-A Supplement 1 for details.

These components arranged as shown on the loop drawings and schematics listed in References 16 thru 25 match the “Loop Type E” as described in Section 6.2 of NEDO-32291-A Supplement 1.

Since the equipment installed in the plant matches the NEDO analyzed configuration, the plant procedures may be compared to the NEDO procedures to determine if they can be applied directly, or if modifications are required to implement the results of the report.

Bounding response Time

The BRT for a component is the maximum response time that could result from credible, undetected, component failures or degradation. Per NEDO-32291-A Supplement, these failures or degradation are not expected to be detectable by any actions other than period Response Time Testing. Failures that

result in a response time higher than the BRT are considered detectable by periodic surveillance other than the RTT. The BRT for each component type has been determined in NEDO-32291-A Supplement 1 via FMEA, component specifications, and industry experience. In order to use the determined BRTs, certain procedural requirements must be met. See Section 3.2 for Equipment Requirements.

Table 3.2.4-2: Selected Equipment BRT from NEDO-32291-A, Supplement 1

Component Set	Abbreviation	Bounding Response Time
Agastat Relays	Agastat	140 milliseconds
GE HFA Relays	HFA	40 milliseconds
Trip Units	TU	24 milliseconds

The BRTs for each component in the loop may be combined together to calculate a BRT for the entire loop logic. Loop type and Loop Logic BRT are taken from NEDO-32291-A Supplement 1, Table 6-2.

Table 3.2.4-3: Selected Loop BRT from NEDO-32291-A, Supplement 1

Loop Type	Trip Unit	TU Output Relay	Logic Relay	Output Relay	Loop Logic BRT
E	TU (24 ms)	Agastat (140 ms)	HFA (40 ms)	HFA (40 ms)	244 ms

The difference between the loop maximum allowable response time and the Loop Logic BRT above is considered the maximum allowable Loop Sensor BRT. If the Loop Sensor has a lower BRT than this difference, then the entire loop response time requirements will be met without periodic RTT.

For the MSIV Main Steam Pressure - Low loops, the required response time of the trip equipment is 1000 milliseconds per the JAF FSAR Table 7.3-12. The note on this table states the following regarding the response time:

“Sensor is eliminated from response time testing for the MSIV actuation logic circuits. Response time testing and conformance to the test acceptance criteria for the remaining channel components includes trip unit and relay logic.”

Based on the information above, the sensor BRT is calculated as (1000 – 244) = 756 milliseconds.

The sensor for the Main Steam Pressure - Low loops is a Rosemount 1153 transmitter that has a BRT of 200 milliseconds per ISP-105A/B. This sensor BRT was determined previously when JAF submitted a Technical Specification amendment to remove RTT for the sensors of the loops considered in this report under NEDO-32291-A. See JAF TS amendment 235 for additional details.

As the sensor BRT is lower that the allowable sensor BRT, NEDO-32291-A Supplement 1 allows us to conclude that surveillance tests other than RTT are sufficient to ensure that the FSAR listed loop response time requirements are met.

3.2.5 REACTOR WATER LEVEL LOW LOW LOW – LEVEL 1

Loop Equipment

The Reactor Water Level Low – Level 1 sensors provide input to the MSIV closure logic when the water level in the reactor drops below the Level 1 setpoint. Equipment in the Reactor Water Level 1 loops are listed in Table 3.2.5-1 below.

Revised Table 3.2.5-1: Reactor Water Level 1 Equipment and Models

Sensor	MTU	TU Output Relay	Logic Relay	Output Relay
02-3LT-57A	02-3MTU-257A (Rosemount 710DU)	05A-K122A (Agastat EGPB)	16A-K1A (12HFA151A9)	16A-K7A (12HFA151A9)
02-3LT-57B	02-3MTU-257B (Rosemount 710DU)	05A-K122B (Agastat EGPB)	16A-K1B (12HFA151A9)	16A-K7B (12HFA151A9)
02-3LT-58A	02-3MTU-258A (Rosemount 710DU)	05A-K122C (Agastat EGPB)	16A-K1C (12HFA151A9)	16A-K7C (12HFA151A9)
02-3LT-58B	02-3MTU-258B (Rosemount 710DU)	05A-K122D (Agastat EGPB)	16A-K1D (12HFA151A9)	16A-K7D (12HFA151A9)

The components in these loops have been analyzed in NEDO-32291-A Supplement 1. See Section 6.1 of NEDO-32291-A Supplement 1 for details.

These components arranged as shown on the loop drawings and schematics listed in References 16 thru 25 match the “Loop Type E” as described in Section 6.2 of NEDO-32291-A Supplement 1.

Since the equipment installed in the plant matches the NEDO analyzed configuration, the plant procedures may be compared to the NEDO procedures to determine if they can be applied directly, or if modifications are required to implement the results of the report

Bounding Response time

The.BRT for a component is the maximum response time that could result from credible, undetected, component failures or degradation. Per NEDO-32291-A Supplement 1, these failures or degradation are not expected to be detectable by any actions other than period Response Time Testing. Failures that result in a response time higher than the BRT are considered detectable by periodic surveillance other than the RTT. The BRT for each component type has been determined in NEDO-32291-A Supplement 1 via FMEA, component specifications, and industry experience. In order to use the determined BRTs, certain procedural requirements must be met. See Section 3.2 for Equipment Requirements.

Table 3.2.5-2: Selected Equipment BRT from NEDO-32291-A, Supplement 1

Component Set	Abbreviation	Bounding Response Time
Agastat Relays	Agastat	140 milliseconds
GE HFA Relays	HFA	40 milliseconds
Trip Units	TU	24 milliseconds

The BRTs for each component in the loop may be combined together to calculate a BRT for the entire loop logic. Loop type and Loop Logic BRT are taken from NEDO-32291-A Supplement 1, Table 6-2

Table 3.2.5-3: Selected Loop BRT from NEDO-32291-A, Supplement 1

Loop Type	Trip Unit	TU Output Relay	Logic Relay	Output Relay	Loop Logic BRT
E	TU (24 ms)	Agastat (140 ms)	HFA (40 ms)	HFA (40 ms)	244 ms

The difference between the loop maximum allowable response time and the Loop Logic BRT above is considered the maximum allowable Loop Sensor BRT. If the Loop Sensor has a smaller BRT than this difference, then the entire loop response time requirements will be met without periodic RTT.

For the MSIV Reactor Water Level Low Low Low – Level 1 Loops, the required response time of the trip equipment is 1000 milliseconds per the JAF FSAR Table 7.3-12. The note on this table states the following regarding the response time:

“Sensor is eliminated from response time testing for the MSIV actuation logic circuits. Response time testing and conformance to the test acceptance criteria for the remaining channel components includes trip unit and relay logic.”

This sensor BRT was determined previously when JAF submitted a TS amendment to remove RTT for the sensors of the loops considered in this report under NEDO-32291-A. See JAF TS amendment 235 for additional details.

Based on the information above, the sensor BRT is calculated as (1000 – 244) = 756 milliseconds.

The sensor for the Reactor Water Level loops is a Rosemount 1153 transmitter that has a BRT of 200 milliseconds per ISP-103A/B. This sensor BRT was determined previously when JAF submitted a Technical Specification amendment to remove RTT for the sensors of the loops considered in this report under NEDO- 32291-A. See JAF TS amendment 235 for additional details.

As the sensor BRT is lower that the allowable sensor BRT, NEDO-32291-A Supplement 1 allows us to conclude that surveillance tests other than RTT are sufficient to ensure that the FSAR listed loop response time requirements are met.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

The proposed change has been evaluated to determine whether applicable regulations and requirements continue to be met. Exelon has determined that the proposed change does not require any exemptions or relief from regulatory requirements, other than the Technical Specifications, and does not affect conformance with any General Design Criteria (GDC) differently than described in the JAF Updated Final Safety Analysis Report (UFSAR). Applicable regulatory requirements will continue to be met, adequate defense-in-depth will be maintained, and sufficient safety margins will be maintained. Exelon adherence to the conditions listed in the NRC Safety Evaluations for the NEDO-32291-A Supplement 1 provides additional assurance that the instrumentation systems will continue to meet the response time requirements of the accident analyses as defined in the UFSAR.

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 NRC'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.

4.2 Precedence

Similar License Amendment request:

The proposed changes are similar to license amendments issued for a number of other nuclear units. Specifically, the proposed amendment is similar to amendments issued for Fermi 2 via letter dated October 2, 2002; Edwin I. Hatch Nuclear Plant Unit 2 via letter dated May 17, 2002; Susquehanna Steam Electric Station Units 1 and 2, vial letter dated March 12, 2001, and LaSalle County Station, Units 1 and 2 via letter dated November 19, 2004.

4.3 No Significant Hazards Consideration

Exelon determined that the proposed change to eliminate Surveillance Requirement (SR) for Response Time Testing, SR 3.3.1.1.15, for function 3, Reactor Pressure – High, and function 4, Reactor Vessel Water Level – Low (level 3) as well as SR 3.3.6.1.8 from TS Section 3.3.6.1,Table 3.3.6.1-1 Functions 1a “Reactor Vessel Water Level – Low Low Low (level 1),” 1.b, "Main Steam Line Pressure - Low," and 1c “Main Steam Line Flow - High” does not involve a significant hazards consideration by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below

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

Response: No.

The proposed amendment to the Technical Specifications (TS) eliminate Surveillance Requirement (SR) for Response Time Testing, SR 3.3.1.1.15, for function 3, Reactor Pressure – High, and function 4, Reactor Vessel Water Level – Low (level 3) as well as SR 3.3.6.1.8 from TS Section 3.3.6.1,Table 3.3.6.1-1 Functions 1a “Reactor Vessel Water Level – Low Low Low (level 1),” 1.b, "Main Steam Line Pressure - Low," and 1c “Main Steam Line Flow - High” is in accordance with NRC approved BWR Owner’s Group Licensing Topical report (NEDO-33291-A Supplement 1) “System Analyses for the Elimination of Selected Response Time Testing requirements,” dated October 1999.

The proposed change does not result in the alteration of the design, material, or construction standards that were applicable prior to the proposed change. The response time assumptions used in the accident analyses remain unchanged. Only the methodology used for response time verification is changed. As documented in the NEDO-33291-A and Supplement 1, a degraded response time will be detected by other TS required tests. The bounding response time of the relays discussed in the supplement 1 can be used in place of actual measured response times to ensure that the instrumentation systems will meet the response time requirements of the accident analysis. The proposed change will not result in the modification of any system interface that would increase the likelihood of an accident since these events are independent of the proposed change. In addition, the proposed amendment will not change, degrade, or prevent actions, or alter any assumptions previously made in evaluating the radiological consequences of an accident.

In summary, 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 amendment to the Technical Specifications (TS) to eliminate Surveillance Requirement (SR) for Response Time Testing, SR 3.3.1.1.15, for function 3, Reactor Pressure – High, and function 4, Reactor Vessel Water Level – Low (level 3) as well as SR 3.3.6.1.8 from TS Section 3.3.6.1,Table 3.3.6.1-1 Functions 1a “Reactor Vessel Water Level – Low Low Low (level 1),” 1.b, "Main Steam Line Pressure - Low," and 1c “Main Steam Line Flow - High” is in accordance with NRC approved BWR Owner’s Group Licensing Topical report (NEDO-33291-A Supplement 1) “System Analyses for the Elimination of Selected Response Time Testing requirements,” dated October 1999.

The proposed change does not involve physical alteration of the station. No new equipment is being introduced, and installed equipment is not being operated in a new or different manner. There are no setpoints at which protective or mitigative actions are initiated that are affected by this proposed action.

The proposed change does not alter assumptions made in the safety analysis. A review of the failure modes of the affected sensors and relays indicates that a sluggish response of the instruments can be detected by other TS surveillances.

The sensors and relays in the affected channels will be able to meet the bounding response times as defined and presented in NEDO-33291-A and Supplement 1. It has been found acceptable to use component bounding response times in place of actual measured response times to ensure that instrumentation systems will meet response time requirements of the accident analyses. In addition, Exelon adherence to the conditions listed in the NRC Safety Evaluations for NEDO-33291-A and Supplement 1 provides additional assurance that the instrumentation systems will meet the response time requirements of the accident analyses.

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

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

Response: No.

The proposed amendment to the Technical Specifications (TS) to eliminate Surveillance Requirement (SR) for Response Time Testing, SR 3.3.1.1.15, for function 3, Reactor Pressure – High, and function 4, Reactor Vessel Water Level – Low (level 3) as well 3.3.6.1.8 from TS Section 3.3.6.1,Table 3.3.6.1-1 Functions 1a “Reactor Vessel Water Level – Low Low Low (level 1),” 1.b, "Main Steam Line Pressure - Low," and 1c “Main Steam Line High Flow” is in accordance with NRC approved BWR Owner’s Group Licensing Topical report (NEDO-33291-A Supplement 1) “System Analyses for the Elimination of Selected Response Time Testing requirements,” dated October 1999.

The current response time limits are based on the maximum values assumed in the plant safety analyses, which conservatively establishes the margin of safety. The elimination of the selected response time testing does not affect the probability of the associated systems to perform their intended function within the allowed response time used as the basis for plant safety analyses. This is based on the ability to detect a degraded response time of an instrument or relay by the other required TS tests, component reliability, and redundancy and diversity of the affected functions, as justified in the reviewed and approved NEDO-33291-A Supplement 1.

Plant and system response to an initiating event will remain in compliance within the assumptions of the safety analyses, and therefore, the margin of safety is not affected.

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

A review 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, or would change an inspection or surveillance requirement. 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(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

REFERENCES

1. James A. FitzPatrick Nuclear Power Plant Docket No. 50-333 “Proposed Change to the Technical Specifications Regarding Response Time testing requirements (JPTS-96-005), letter dated May 30, 1996.

2. Issuance of Amendment for James A. FitzPatrick Nuclear Power Plant (TAC No. M95524), dated October 28, 1996

3. BWR Owner’s Group Licensing Topical Report (NEDO-32291-A) “System Analyses for the Elimination of Selected Response Time Testing requirements,” dated October 1995

4. Letter from U.S. NRC to BWR Owner’s Group Documenting NRC Review of NEDO-32291-A, Dated December 28, 1994

5. BWR Owner’s Group Licensing Topical Report (NEDO-32291-A Supplement 1) “System Analyses for the Elimination of Selected Response Time Testing requirements,” dated October 1999

6. Letter from U. S. NRC to W. Glenn Warren (BWR Owners' Group), "Review of Boiling Water Reactor Owners Group (BWROG) Licensing Topical Report NED0-32291, Supplement 1, System Analyses for Elimination of Selected Response Time Testing Requirements," dated June 11, 1999

7. NUREG-1433, Standard Technical Specifications, General Electric BWR/4 Plants, Volume 1, Revision 4, dated April 2012

8. LP-02-3N, “Loop Diagram Nuclear Boiler Instrumentation Reactor Vessel High Pressure Auto SCRAM A1 02-3PT-55A System 02-3”, Revision 2

9. LP-02-3P, “Loop Diagram Nuclear Boiler Instrumentation Reactor Vessel High Pressure Auto SCRAM B1 02-3PT-55B System 02-3”, Revision 1

10. LP-02-3Q, “Loop Diagram Nuclear Boiler Instrumentation Reactor Vessel High Pressure Auto SCRAM A2 02-3PT-55C System 02-3”, Revision 1

11. LP-02-3R, “Loop Diagram Nuclear Boiler Instrumentation Reactor Vessel High Pressure Auto SCRAM B2 02-3PT-55D System 02-3”, Revision 2

12. LP-05E, “Loop Diagram Reactor Protection System Reactor Low Level Trip Channel A1 02-3LT- 101A System 05”, Revision 1

13. LP-05F, “Loop Diagram Reactor Protection System Reactor Low Level Trip Channel B1 02-3LT-101B System 05”, Revision 1

14. LP-05G, “Loop Diagram Reactor Protection System Reactor Low Level Trip Channel A2 02-3LT- 101C System 05”, Revision 1

15. LP-05H, “Loop Diagram Reactor Protection System Reactor Low Level Trip Channel B2 02-3LT-101D System 05”, Revision 1

16. LP-02-3E, “LOOP DIAGRAM NBI RECIRC PMP TRIP LEVEL AND PRESSURE, MST VLV CLOSURE LEVEL, AND ARE ATWS PRESSURE “A””, Revision 3

17. LP-02-3F, “LOOP DIAGRAM NBI RECIRC PMP TRIP LEVEL AND PRESSURE, MST VLV CLOSURE LEVEL, AND ARE ATWS PRESSURE “B””, Revision 3

18. LP-02-3G, “LOOP DIAGRAM NBI RECIRC PMP TRIP LEVEL AND PRESSURE, MST VLV CLOSURE LEVEL, AND ARE ATWS PRESSURE “A””, Revision 3

19. LP-02-3H, “LOOP DIAGRAM NBI RECIRC PMP TRIP LEVEL AND PRESSURE, MST VLV CLOSURE LEVEL, AND ARE ATWS PRESSURE “B””, Revision 3

20. LP-02V, “LOOP DIAGRAM MAIN STEAM SYSTEM FLOW MSIV A, B, C, & D DIFFERENTIAL PRESSURE”, REVISION 1

21. LP-02W, “LOOP DIAGRAM MAIN STEAM SYSTEM FLOW MSIV A, B, C, & D DIFFERENTIAL PRESSURE”, REVISION 2

22. LP-02X, “LOOP DIAGRAM MAIN STEAM SYSTEM FLOW MSIV A, B, C, & D DIFFERENTIAL PRESSURE”, REVISION 1

23. LP-02Y, “LOOP DIAGRAM MAIN STEAM SYSTEM FLOW MSIV A, B, C, & D DIFFERENTIAL PRESSURE”, REVISION 3

24. LP-02T, “LOOP DIAGRAM MAIN STEAM PRESSURE LINES A & C SYS 29”, REVISION 2

25. LP-02U, “LOOP DIAGRAM MAIN STEAM PRESSURE LINE B & D SYS 29, “REVISION 2