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August 14, 2003
PY-CEI/NRR-2675L

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Perry Nuclear Power Plant
Docket No. 50-440
License Amendment Request Pursuant to 10 CFR 50.90: Increase in Main Steam Line Turbine Building High Temperature Trip Setpoint Allowable Value

Ladies and Gentlemen:

Nuclear Regulatory Commission (NRC) review and approval of a License Amendment Request (LAR) for the Perry Nuclear Power Plant (PNPP) is requested. The proposed LAR increases the analytical limit and the resulting Technical Specification Allowable Value (AV) related to the setpoint for the Main Steam Line Turbine Building Temperature – High, system isolation function.

This LAR revises the main steam line isolation trip setpoint AV based on improved computer modeling of the expected building temperature transients in the event of a larger steam leak. The proposed change improves the operating margins and reduces challenges to the plant by avoiding unnecessary plant shutdown transients from Turbine Building high temperatures from other than a main steam line leak.

Implementation of the proposed LAR is planned to support operation in the summer of 2004. Therefore, to support this activity, it is requested that the proposed LAR be approved no later than June 1, 2004.

There are no commitments contained in this letter or its attachments. If you have questions or require additional information, please contact Mr. Vernon K. Higaki, Manager – Regulatory Affairs, at (440) 280-5294.

Very truly yours,

Attachments:

1. Notarized Affidavit
2. An evaluation of the change, including a Summary, Description of the Proposed Change, Background, Technical Analysis, Conclusion, and Environmental Consideration
3. Significant Hazards Consideration
4. Proposed Technical Specification Change (mark-up)

cc: NRC Project Manager
NRC Resident Inspector
NRC Region III
State of Ohio

A001

I, William R. Kanda, hereby affirm that (1) I am Vice President - Perry, of the FirstEnergy Nuclear Operating Company, (2) I am duly authorized to execute and file this certification as the duly authorized agent for The Cleveland Electric Illuminating Company, Toledo Edison Company, Ohio Edison Company, and Pennsylvania Power Company, and (3) the statements set forth herein are true and correct to the best of my knowledge, information and belief.

William R. Kanda

Subscribed to and affirmed before me, the 14 day of August, 2003

Jane E Mott

JANE E. MOTT
Notary Public, State of Ohio
My Commission Expires Feb. 20, 2005
(Recorded in Lake County)

SUMMARY

Nuclear Regulatory Commission (NRC) review and approval of a License Amendment Request (LAR) for the Perry Nuclear Power Plant (PNPP) is requested. The proposed LAR increases the analytical limit for detected temperature and the resulting Technical Specification Allowable Value (AV) related to the setpoint for the Main Steam Line Turbine Building Temperature – High, system isolation function.

The ambient temperature in the Turbine Building approaches the isolation setpoint for the main steam isolation valves and drains during the summer months when there are consecutive days of high outside air temperature. Therefore, the isolation setpoint may be reached without the presence of a steam leak. A main steam isolation and associated reactor scram would occur if this setpoint is reached. An unnecessary isolation of the Main Steam system is a plant transient, which should be avoided. Therefore, the proposed LAR will revise the AV based on improved computer modeling of the expected building temperature transients in the event of a steam leak larger than that originally postulated. The proposed change improves the operating margin and reduces challenges to the plant due to unnecessary plant shutdowns.

An increase in the Leak Detection System (LDS) upper bound leakage limit from an equivalent mass steam leakage value of 25 gallons per minute (gpm) (approximately 3 lbm/sec) to 280 gpm (approximately 33 lbm/sec) is proposed. This increase in the upper bound leakage limit will result in an increase in the main steam line Turbine Building high temperature isolation analytical limit; which in turn, results in an increase in the associated LDS isolation AV and the resulting LDS instrumentation isolation setpoint.

The proposed change in the upper bound of detected steam leakage limit still results in timely isolation of a Main Steam system leak. Analyses performed in support of the proposed change indicate the consequences of the higher leakage limit remain bounded by the current licensing basis, which is the projected offsite dose consequences of a main steam line break. Additionally, the proposed change has been shown to maintain the integrity of the Main Steam system and the required makeup system capability.

DESCRIPTION OF THE PROPOSED CHANGE

The proposed LAR increases the Technical Specification Table 3.3.6.1-1, Item 1.f, Allowable Value of Main Steam Line Turbine Building Temperature – High function from 138.9° F to 149.6° F.

BACKGROUND

The nuclear boiler LDS includes instrumentation to detect leakage from the Reactor Coolant Pressure Boundary (RCPB) and the Main Steam system piping. The subject LDS instrumentation assists in the detection of a small steam leak to prevent a significant release of radioactive material created by conditions other than a line break. The leak to be detected is currently an equivalent mass of 25 gpm of steam for piping outside of the RCPB within the non-safety related Turbine Building. This basis is specifically addressed in the PNPP Updated Safety Analysis Report (USAR), Section 5.2.5.1.3.b. Once the steam leakage limit is detected, the LDS instrumentation will initiate the automatic closure of the associated Containment isolation valves, which are the main steam isolation valves and the main steam line drains. This automatic isolation will assist in preventing a significant release of radioactive material to the environment.

The steam leakage limit is detected by the use of thermocouples that sense high ambient temperatures. The main steam line area of concern is the Turbine Building. As controlled by PNPP Technical Specifications, Table 3.3.6.1-1, Item 1.f, the high temperature AV is currently 138.9° F and the corresponding analytical limit is currently 145° F.

The following provides some history of the licensing basis for the subject LDS instrumentation.

The Boiling Water Reactor (BWR) design has evolved beyond the regulatory requirements of 10 CFR 50, Appendix A, and General Design Criterion 54, to include additional leak detection system features to improve the capability to locate small leaks and shorten the response time to mitigate RCPB pipeline breaches. Parameters such as low reactor water level, high main steam line flow, and low main steam line pressure exist to satisfy the regulatory requirements for the detection, isolation, and containment of RCPB leakage.

The addition of equipment room ambient temperature and equipment room differential temperature monitoring were provided at newer plants because these features increased the ability to detect smaller leaks. These enhancements improved the redundancy and diversity of the LDS.

There is no regulation or approved guidance, i.e., Regulatory Guide; Standard Review Plan; 10 CFR 50, Appendix A General Design Criteria; etc. that specifies the need for leak detection instrumentation or for the detection of an equivalent mass steam leakage value of 25 gpm outside of Containment.

There is no accident analysis or transient that credits the subject leak detection instrumentation. The subject instrumentation is for the detection of small steam leaks and not a large pipeline break as assumed in the USAR Chapter 15 accident analysis. The detection of main steam line flow is the parameter used in the accident analysis to signal a main steam line break outside of Containment. In addition, the PNPP has many diverse methods to detect excessive RCPB leakage. For example, the following parameters are monitored by the LDS to limit RCPB leakage: reactor water level, main steam line flow rate, area differential temperatures, and low condenser vacuum (reference USAR Section 5.2.5.1.a and Table 5.2-8).

The ambient temperature monitoring was installed to meet the intent of the LDS equipment designer - General Electric (GE) and is part of the original plant licensing basis described in PNPP's Final Safety Analysis Report. The 25 gpm criteria was conservatively applied to the LDS temperature monitoring instrumentation to limit the radiological release to below 10 CFR 100 limits as recommended by GE in their supplied design specification for the LDS. The architectural engineer for PNPP selected the 25 gpm leakage criterion in the design phase of the LDS based on the recommendation from GE.

The proposed LAR is necessary to reduce the possibilty of an unnecessary isolation of the Main Steam system. The ambient temperature in the Turbine Building approaches the isolation setpoint for the main steam isolation valves and drains during the summer months when there are consecutive days of high outside air temperature. With no known steam leaks in the Turbine Building, the weekly average ambient temperature has been recorded as high as 133° F, which is just 2.8° F from the instrument setpoint of 135.8° F. Therefore, the isolation setpoint may be reached without the presence of a steam leak. A main steam isolation and associated reactor scram would occur if this setpoint is reached. An unnecessary isolation of the Main Steam system is a plant transient, which should be avoided. Therefore, it is desirable to raise the analytical limit and associated Technical Specification AV for the leak detection temperature

switches that trigger the Main Steam system isolation. The proposed LAR raises the current analytical limit of 145° F for the associated LDS switches to 155° F to avoid the possibility of unnecessary system isolation during the hot summer months. Raising this limit means that the current upper bound for the LDS Main Steam leakage isolation criteria (25 gpm) would increase to provide the energy input into the Turbine Building to raise the ambient temperature to the new analytical limit.

As previously pointed out, the 25 gpm limit was originally established by GE as a recommended value. The 25 GPM leak rate for the Turbine Building was documented in the PNPP USAR and Technical Specification Bases. It was not specifically documented in the NRC Safety Evaluation Report (SER), NUREG 0887, as the basis for the Turbine Building setpoint.

A 10 CFR 50.59 evaluation has been completed to determine the acceptability of changing the design basis steam leakage beyond 25 gpm. A LAR is required because the associated AV is controlled within Technical Specifications.

TECHNICAL ANALYSIS

After evaluating industry and PNPP specific licensing and design basis information for the subject leak detection instrumentation, it was determined that the NRC concluded in the PNPP SER that the leak detection system was acceptable provided the following three criteria were satisfied.

1) The radiological consequences of the leak to be detected will be bounded by the current main steam line break analysis.

2) The leak will be detected on a timely basis so that corrective actions can be taken before such degradation could become sufficiently severe to jeopardize the safety of the Main Steam system.

3) The leak will be detected before the leakage could increase to a level beyond the capability of the makeup system.

In order to support the proposed LAR, a new analysis of Turbine Building temperature response to a steam leak was performed. This analysis used the computer code, GOTHIC, in lieu of the COMPARE code used in the original analysis. The original COMPARE model was a very simplistic two volume model with neither heat sinks nor Heating, Ventilation, and Air Conditioning (HVAC) accounted for. For the new analysis, in conjunction with the use of GOTHIC, a more detailed analytical model of the Turbine Building was created.

COMPARE was developed for performing transient Containment subcompartment pressure response for the nuclear industry. The subcompartments are represented by volumes that are connected with junctions. The thermodynamics and flow equations assume a homogenous mixture of a combination of steam and air. GOTHIC was also developed for thermal hydraulic evaluation of nuclear power plant Containments. Generally speaking, it is more sophisticated than COMPARE because GOTHIC uses built in mechanistic models to handle interface mass, energy, and momentum transfer. However, the basic structure of volumes and junctions is similar to COMPARE. Both computer codes solve the same general mass and energy conservation equations to arrive at a solution. Therefore, these two programs are similar and both are applied in a fashion for which they were designed. Since the desire is to build a more complex model of the Turbine Building, GOTHIC is better than COMPARE for this task.

GOTHIC is an advanced computer program used to perform transient thermal analysis of multiphase systems in complex geometries. This code can be used for calculation of room temperature response due to failed or degraded room cooling systems, and calculation of temperature profiles for equipment qualification, inadvertent system initiation, and the failure of engineered safety systems. Numerical Applications, Inc. (NAI) developed GOTHIC for the Electric Power Research Institute (EPRI). The GOTHIC program has been previously approved for use by the NRC for many nuclear power plants such as Joseph M. Farley, Waterford 3, River Bend, and the Clinton Power Station for applications such as Containment, high energy line break and HVAC analyses.

The GOTHIC code was used to address the affects of local temperature increases in the Turbine Building by subdividing volumes of the area into different nodes. This analysis incorporates realistic design features such as multiple volumes to accurately track steam flow from the leak, metal heat sinks, and HVAC effects. Specifically, a steam leak was modeled by assigning its location to different nodes throughout this large building. The analysis also included the impact of heat structures, such as the building's floor and ceiling. These features are in contrast to the original analysis which included only two volumes and no heat sinks or HVAC. The calculation was also performed using the spectrum of ambient temperatures in the Turbine Building consistent with winter, summer, and average conditions.

From this model, the local temperature in the vicinity of the leak detection thermocouples was determined. The following details explain how the new leak rate limit meets the three criteria previously listed.

Radiological Consequences

The projected radiological dose consequences for the Turbine Building steam leak must not exceed the limits established in 10 CFR 100. The current licensing bases corresponds to the projected offsite dose consequences of the mass released from the controlling full main steam line break outside Containment, which has been estimated to be equivalent to 141,687 lbm. This release has been shown to result in projected whole body and thyroid doses well below the 10 CFR 100 limits at the exclusion area and low population zone boundaries as shown in the table below. The dose assessments for this release are extremely conservative in that they each assume that the full release inventory is available for immediate inhalation. Even so, the resulting dose is only a fraction of the 10 CFR 100 limits. The currently analyzed results for the 141,687 lbm release as depicted in USAR Table 15.6-8 are:

STEAM LINE BREAK ACCIDENT
(Iodine Concentration in Coolant = 4.0 μCi/gm dose – equivalent I-131)
RADIOLOGICAL EFFECTS

	Whole Body Dose (25 rem limit)	Inhalation Dose (300 rem limit)
Exclusion area (863 Meters)	9.21E – 1	8.92E + 1
Low population zone (4,002 Meters)	1.13E - 1	1.09E + 1

For the proposed new leak rate limit of 280 gpm, the Turbine Building temperature reaches the new analytical limit of 155° F in about 17.5 minutes. This equates to a release of approximately 34,578 lbm. The estimated release for the proposed new leak rate limit (based on lbm) is less than 25% of the limiting main steam line break release. The main steam line break limiting release (89.2 rem inhalation dose at the exclusion area boundary) is approximately 30% of the 10 CFR 100 thyroid inhalation dose at the exclusion area boundary. The proposed new leak rate limit is a small percentage of the calculated 10 CFR 100 results for the main steam line break release outside Containment and an even smaller percentage of the 10 CFR 100 limits.

Also, the isolation setpoint will be approximately 145° F so the actual release prior to isolation will be smaller than at the analytical limit of 155° F. The setpoint is inherently lower than the analytical limit, 155° F, due to Perry's setpoint methodology (GE Topical Report NEDC-31336) that typically considers loop instrument accuracy, calibration accuracy, and instrument drift values. Therefore, the radiological effects associated with the postulated small steam leak remains bounded by the existing accident analysis contained within the PNPP USAR Section 15.6.4, "Steam System Piping Break Outside Containment."

In addition, all steam releases in the Turbine Building can be detected by other alternate means such as plant radiation monitors, rising temperature indication on the area ambient temperature monitors, operator rounds, noted steam cycle efficiency decrease, etc. These other redundant means of detection provide an opportunity for actions prior to automatic isolation. The proposed LAR does not alter these other means of detection.

Isolation to Prevent Jeopardy to the System

There are no published acceptance criteria for this requirement; however, it is reasonable to conclude that this requirement can be interpreted as isolating the system while not exceeding the main steam line critical crack length. That is, the system should isolate upon detection of leaks potentially indicative of cracks with the potential to propagate to full design basis main steam line break.

The material of the associated piping in the Turbine Building is carbon steel, which is not subject to stress corrosion cracking. Therefore, a line break or pipe crack would not be an expected phenomena for this piping. Further, a calculation has been completed which determined that the LDS would still isolate the main steam system at a point that is less than the critical crack length. That is, with the proposed new leak rate limit of 280 gpm, the LDS will isolate the Main Steam system to prevent the leak from rapidly becoming the design basis full line break.

Leak Shall Not Exceed Makeup Capability

GE establishes the Loss Of Coolant Accident (LOCA) limit as an equivalent 2-inch diameter schedule 80 pipe break based on the normal makeup capability, which is approximately an equivalent mass Main Steam system leakage value of 383 gpm. The proposed upper bound equivalent mass steam leak of 280 gpm is much less than the leakage equivalent to a 2-inch diameter schedule 80 line break. That is, a LOCA is a break that far exceeds the upper bound leakage to be detected. Therefore, the new leakage limit does not qualify as a LOCA, does not exceed the normal system makeup capability, and this criterion remains intact.

In addition, as controlled under Alarm Response Instruction ARI-H13-P601-19, a Control Room alarm exists for a high ambient temperature in the steam tunnel area of the Turbine Building just downstream of the main steam isolation valves for temperatures greater than or equal to 145° F.

Follow up actions such as checking for the presence of steam leaks and scramming the plant if necessary are detailed in this instruction. Also, other methods of leak detection such as radiation monitors, changes in sump level, visual remote monitoring, and visual inspection during operator rounds remain available to assist in timely leak detection and isolation.

Other Considerations

The proposed Allowable Value change has been evaluated to determine if Equipment Qualification (EQ) conclusions would be impacted. The EQ accident scenario is based on a large main steam line break that results in a maximum temperature of at least 160° F for greater than two hours. The new AV does not produce a more challenging EQ environment from a temperature perspective, i.e., the Turbine Building ambient temperature is not changed with the proposed LAR. Additionally, the currently established accident environmental pressure, radiation, and humidity exceed those anticipated from a 280 gpm leak. It is therefore concluded that the service life and structural integrity of the structures, systems and components in the Turbine Building area are not significantly affected or adversely impacted by the proposed LAR.

Jetting leaks and reaction loads resulting from the proposed new upper bound leak rate are much less than that of a main steam line guillotine rupture. For damage protection, the associated LDS temperature sensors are partially shielded by welded tube steel. The tube steel is welded to embed plates providing overall rigid construction. The associated LDS temperature sensors are at the same elevation and sensors for the same division are separated by approximately 18 feet. The conduits are seismically supported with hangers securely attached to concrete or steel structures. Lastly, the temperature sensors have a "thermal couple brownout feature" that causes the unit to trip when the signal loop opens. Thus, in the remote possibility there is a loss of a conduit or an instrument due to jetting, a trip signal would likely result. Therefore, jetting leaks and reaction loads from a crack do not significantly increase the potential failure of the instrument function, which is to isolate the main steam line.

The PNPP Probabilistic Safety Assessment (PSA) does not explicitly model the Turbine Building high temperature function to isolate the main steam isolation valves and main steam line drains. Since the LDS Main Steam Line Turbine Building Temperature – High function is categorized as non-risk significant, the proposed LAR to increase the main steam system isolation leakage limit in the Turbine Building will have no significant impact on plant risk.

CONCLUSION

There is no regulation or approved guidance, i.e., Regulatory Guide; Standard Review Plan; 10 CFR 50, Appendix A General Design Criteria; etc. that specifies the detection of a 25 gpm leak rate outside Containment for the subject LDS instrumentation. There is no accident analysis or transient that credits the associated leak detection instrumentation.

The previous analysis for establishing the Allowable Value for the Main Steam Line Turbine Building Temperature – High function can be improved using up-to-date computer modeling techniques.

The new analysis using the GOTHIC computer code is more appropriate because it more accurately accounts for the building heat structures, HVAC effects, and a spectrum of outside air temperatures. The proposed change will increase the operating margin, which reduces the potential for unnecessary plant transients. The current setpoint basis of 25 GPM can be relaxed

to allow for additional operational flexibility without violating the licensing basis for the existence of the leak detection system.

The new Turbine Building upper bound equivalent mass steam leak rate of 280 gpm (33 lbm/sec) will:

- Isolate the Main Steam system at a small fraction of the 10 CFR 100 dose limits.
- Isolate the Main Steam system at a crack length, which is less than the critical crack length.
- Isolate the Main Steam system before the capability to make-up is challenged.

This ensures that the criteria for acceptance as established in the original licensing bases and the requirements of the original design basis remain valid.

Based on the results of new analysis, it was concluded that the Allowable Value for the Main Steam Line Turbine Building Temperature – High could be increased to 149.6° F.

ENVIRONMENTAL CONSIDERATION

The proposed Technical Specification change request was evaluated against the criteria of 10 CFR 51.22 for environmental considerations. The proposed change does not significantly increase individual or cumulative occupational radiation exposures, does not significantly change the types or significantly increase the amounts of effluents that may be released off-site and, as discussed in Attachment 3, does not involve a significant hazards consideration. Based on the foregoing, it has been concluded that the proposed Technical Specification change meets the criteria given in 10 CFR 51.22(c)(9) for categorical exclusion from the requirement for an Environmental Impact Statement.

SIGNIFICANT HAZARDS CONSIDERATION

The standards used to arrive at a determination that a request for amendment involves no significant hazards considerations are included in the Nuclear Regulatory Commission's Regulation, 10 CFR 50.92, which states that the 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 previously evaluated; or (3) involve a significant reduction in a margin of safety.

Nuclear Regulatory Commission review and approval is requested of an amendment to the Perry Nuclear Power Plant (PNPP) Technical Specifications to incorporate a revised Allowable Value related to the isolation setpoint for the Main Steam Line Turbine Building Temperature – High function.

The proposed amendment has been reviewed with respect to these three factors and it has been determined that the proposed change does not involve a significant hazard because:

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

   The nuclear boiler Leak Detection System (LDS) instrumentation associated with the proposed amendment assists in the detection of a small steam leak to prevent a significant release of radioactive material created by conditions other than a break within the Reactor Coolant Pressure Boundary (RCPB). The proposed amendment establishes a new steam leak system isolation temperature limit in the Turbine Building.

   There is no accident analysis or transient that credits the subject Leak Detection System instrumentation. The subject instrumentation is for the detection of small steam leaks and not a pipeline break as described in the Updated Safety Analysis Report (USAR) Chapter 15 accident analysis. The detection of main steam line flow is the parameter used in the accident analysis to signal a steam line break outside of Containment.

   The proposed amendment does not impact the physical design or location of the LDS instrumentation. This proposed amendment is associated only with the results of a main steam line leak in the non-safety related Turbine Building and has no impact on the initiation of this leak. The analysis completed in support of the proposed amendment indicates that the radiological effects associated with the new steam leak system isolation limit remains bounded by the existing large main steam line break analysis contained within the PNPP USAR. The proposed leakage limit does not alter the current function of the Leak Detection System that isolates the Main Steam system prior to the leakage degrading to a point where the system integrity, i.e., piping integrity and makeup capability, is challenged. Therefore, the proposed amendment ensures that the criteria for acceptance as established in the original licensing bases and the requirements of the original design basis remain valid. It has been determined that the service life, i.e., Equipment Qualification (EQ) and structural integrity of the Structures, Systems and Components (SSC) in the affected areas are not adversely impacted by the proposed amendment.

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

2. The proposed change would not create the possibility of a new or different kind of accident from any previously evaluated.

   The proposed amendment does not impact the physical design or location of the associated Leak Detection instrumentation. The instruments will still promptly initiate the automatic isolation of the appropriate Containment and Drywell isolation valves to mitigate steam leakage as credited in the original licensing bases. This proposed amendment is associated only with the results of a main steam line leak in the non-safety related Turbine Building and has no impact on the initiation of this leak. The analysis completed in support of the proposed amendment indicates that the radiological effects associated with the new steam leak system isolation limit remains bounded by the existing large main steam line break analysis contained within the PNPP USAR. The EQ and structural integrity of any SSC located within the non-safety related Turbine Building are not affected by the proposed amendment. Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed change will not involve a significant reduction in the margin of safety.

   The analysis performed for the proposed amendment proves that the appropriate instruments will still promptly initiate automatic system isolation, upon sensing temperatures in excess of their setpoints. The radiological effects associated with the proposed small steam leak to be detected remain bounded by the existing large main steam line break analysis contained within the USAR. Steam leaks in the affected area of the Turbine Building will be detected on a timely basis so that the Main Steam system will be isolated before such degradation could become sufficiently severe to jeopardize the safety of the system. Also, steam leaks will be detected before the leakage could increase to a level beyond the capability of the makeup system. Therefore, the proposed amendment ensures that the criteria for acceptance as established in the original licensing bases and the requirements of the original design basis remain valid. There is no accident analysis or transient that credits the associated leak detection instrumentation and the LDS Main Steam Line Turbine Building Temperature – High function is categorized as non-risk significant. Further, the proposed amendment reduces the challenges to SSCs due to unnecessary plant shutdowns created by conditions other than a main steam line leak. The EQ and structural integrity of any SSC located within the Turbine Building are not affected by the proposed amendment. Therefore, the proposed amendment does not involve a significant reduction in the margin of safety.

MARKED-UP

TECHNICAL SPECIFICATION PAGE

REFLECTING THE PROPOSED AMENDMENT

Table 3.3.6.1-1 (page 1 of 6)
Primary Containment and Drywell Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Main Steam Line Isolation					
a. Reactor Vessel Water Level - Low Low Low, Level 1	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ 14.3 inches
b. Main Steam Line Pressure - Low	1	2	E	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ 795.2 psig
c. Main Steam Line Flow - High	1,2,3	2 per MSL	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 256.5 psid
d. Condenser Vacuum - Low	1,2[a], 3[a]	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ 7.6 inches Hg vacuum
e. Main Steam Line Pipe Tunnel Temperature - High	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.7	≤ 158.9°F
f. Main Steam Line Turbine Building Temperature-High	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ ~~138.9°F~~ 149.6°F
g. Manual Initiation	1,2,3	2	G	SR 3.3.6.1.5	NA
2. Primary Containment and Drywell Isolation					
a. Reactor Vessel Water Level - Low Low, Level 2	1,2,3	2[b]	H	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ 127.6 inches

(continued)

(a) With any turbine stop valve not closed.

(b) Required to initiate the associated drywell isolation function.