Florida Power & Light Company, 6501 South Ocean Drive, Jensen Beach, FL 34957

October 18, 2001

L-2001-216
10 CFR 50.90

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

RE: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Proposed License Amendments
ESFAS Trip/Bypass Single Failure Vulnerabilities

Pursuant to 10 CFR 50.90, Florida Power and Light Company (FPL) requests to amend Facility Operating Licenses DPR-67 for St. Lucie Unit 1 and NPF-16 for St. Lucie Unit 2 by incorporating the attached Technical Specifications (TS) revisions. The proposed amendments would revise the TSs to limit the period of time that inoperable recirculation actuation signal (RAS), containment spray actuation signal (CSAS), and auxiliary feedwater actuation signal (AFAS) input channels could be in the bypass and/or tripped condition in order to maintain the functional capability and performance levels of equipment required for the safe operation of St. Lucie Units 1 and 2.

Attachment 1 is an evaluation of the proposed changes. Attachment 2 is the "Determination of No Significant Hazards Consideration." Attachments 3 and 4 contain copies of the affected Technical Specifications pages marked up to show the proposed changes.

The St. Lucie Facility Review Group and the FPL Company Nuclear Review Board have reviewed the proposed amendments. In accordance with 10 CFR 50.91(b)(1), copies of the proposed amendments are being forwarded to the State Designee for the State of Florida.

There is no requested approval date, so process this as a normal amendment request. Please issue the amendment to be effective on the date of issuance and to be implemented within 60 days of receipt by FPL.

A001

Please contact us if there are any questions about this submittal.

Very truly yours,

Donald E. Jernigan
Vice President
St. Lucie Plant

DEJ/KWF

Attachments

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant
Mr. W. A. Passetti, Florida Department of Health

STATE OF FLORIDA)
) ss.
COUNTY OF ST. LUCIE)

Donald E. Jernigan, being first duly sworn, deposes and says:

That he is Vice President, St. Lucie Plant, for the Nuclear Division of Florida Power and Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensee.

Donald E. Jernigan

STATE OF FLORIDA

COUNTY OF St. Lucie

Sworn to and subscribed before me

this 18 day of October, 2001

by Donald E. Jernigan, who is personally known to me.

Leslie J. Whitwell

Signature of Notary Public-State of Florida

Leslie J. Whitwell
MY COMMISSION # DD020212 EXPIRES
May 12, 2005
BONDED THRU TROY FAIN INSURANCE, INC.

Name of Notary Public (Print, Type, or Stamp)

EVALUATION OF PROPOSED TS CHANGES

EVALUATION OF PROPOSED TS CHANGES

BACKGROUND

The NRC issued Administrative Letter 98-10 to reiterate the Staff's expectation that licensees correct the facility Technical Specifications (TS) when they are found to contain nonconservative values or specify incorrect actions. The NRC had found that some licensees had invoked administrative controls to assure safety when the licensee discovered certain conditions where the Technical Specifications were not sufficiently conservative. The administrative controls established by the licensees were not always instituted in revisions to the Technical Specifications.

In response to that administrative letter, FPL identified several such administrative controls at St. Lucie that have not yet resulted in appropriate TS revision. These administrative controls were established in recognition of extraordinary failure mechanisms (including a vital DC bus failure) that were not considered in the original Technical Specifications. The following actuation systems were affected.

Recirculation Actuation Signal (RAS): The RAS automatically switches the safety injection suction source from the refueling water tank (RWT) to the containment sump during a loss of coolant accident (LOCA). St. Lucie TS (Units 1 and 2) have allowed one RAS instrument channel to be placed in the trip condition for an indefinite period. However, with one channel indefinitely in the tripped condition, FPL recognized that a single failure to any other RAS instrument channel during the injection phase of a LOCA could adversely affect accident mitigation (CE Infobulletin 97-02, "Spurious Recirculation Actuation Signal," dated May 23, 1997). An administrative control was established in Administrative Procedure 0010120, "Conduct of Operations," to limit the time that an inoperable RAS instrument channel may be placed in the trip condition.

Auxiliary Feedwater Actuation Signal (AFAS): The AFAS takes input from steam generator level, differential feedwater header pressure, and differential steam generator pressure to automatically initiate auxiliary feedwater and isolate a feedwater header or steam generator break. Somewhat similar to the RAS, the St. Lucie TS (Units 1 and 2) allow one channel of AFAS to be placed in the trip or bypass condition for an indefinite period. Again, FPL recognized that there are credible single failures in these conditions (i.e., with one channel in trip) that could adversely affect accident mitigation. An administrative control was established in Administrative Procedure 0010120, "Conduct of Operations," to limit the time that an AFAS instrument channel may be placed in the trip condition.

Another actuation system is subject to an extraordinary single failure while an instrument channel is inoperable. Although no administrative control has been established nor

required for this third system, a TS revision is appropriate to impose new restrictions that demonstrate consistent application of the single failure criterion as described below:

Containment Spray Actuation Signal (CSAS): The CSAS takes input from containment pressure and safety injection actuation system (SIAS) to automatically initiate containment spray when required. The Unit 1 TS allows one channel of CSAS to be placed in bypass condition for an indefinite period and the Unit 2 TS allows an indefinite trip condition if not restored within 48 hours. Again, FPL recognized that there are postulated single failures that could adversely affect accident mitigation while the CSAS channel(s) are bypassed. While bypassed, a vital DC bus failure could preclude a CSAS actuation altogether.

The TS changes to limit the period of time that inoperable input channels could be in bypass and/or tripped are submitted to maintain the functional capability and/or performance level of equipment required for the safe operation of St. Lucie Units 1 and 2.

DESCRIPTION OF PROPOSED CHANGE

The proposed Unit 1 and Unit 2 Technical Specification changes are summarized below. Marked-up Technical Specification pages for this proposed change are provided as Attachments 3 and 4.

RAS

Unit 1 Technical Specification 3.3.2.1 and Unit 2 Technical Specification 3.3.2, "Engineered Safety Feature Actuation System Instrumentation," requirements for RAS will be revised to restrict the time period that a channel may be in bypass or trip condition before which a plant shutdown must be initiated. The proposed specification would place the affected trip function in bypass or trip within 1 hour. The proposed TS would require that the inoperable channel be restored to OPERABLE status within the 48-hour period. Comparable to the Combustion Engineering (CE) Standard Technical Specifications (STS), the proposed TS would impose a new restriction that the affected unit be in HOT STANDBY in six hours, and HOT SHUTDOWN in the following six hours if OPERABILITY cannot be restored within the specified time limit. The TS revision would remove a note from Unit 1 TS stating that the provisions of TS 3.0.4 are not applicable to the associated ACTION statement. Removal of this note is acceptable since continued noncompliance to the conditions would result in a shutdown to comply with the action requirements. Lastly, one additional channel may be bypassed for up to 2 hours for surveillance testing and maintenance provided the other channel is placed in the tripped condition.

The net effect of this revision is a restriction of the temporary period that the second inoperable channel may be bypassed (from 48 hours to 2 hours – Unit 1 only), and the revision imposes a new ACTION to shutdown if OPERABILITY can not be restored (Units 1 and 2).

CSAS

Unit 1 Technical Specification 3.3.2.1 and Unit 2 Technical Specification 3.3.2, "Engineered Safety Feature Actuation System Instrumentation," requirements for CSAS will be revised to restrict the time period that a channel may be in bypass (48 hours, Unit 1 only) before which the affected instrument channel must be placed in trip. The proposed specifications would place the affected trip function in bypass or trip within one hour. The inoperable channel may be placed in the bypass condition for up to 48 hours from the time of initial loss of operability. The proposed TS would require that the inoperable channel be restored to OPERABLE status within the 48-hour period or be placed in the trip condition.

The net effect of this revision is a restriction on the Unit 1 TS for the bypass condition. Both TSs will require restoration of an inoperable channel within 48 hours or it must be placed in the trip condition. In addition, the U1 TS will provide relaxation of the temporary period that the second inoperable channel may be bypassed (from 2 hours to 48 hours). The TSs for both units will require a shutdown if two channels remain inoperable for more than 48 hours.

AFAS

Unit 1 Technical Specification 3.3.2.1 and Unit 2 Technical Specification 3.3.2, "Engineered Safety Feature Actuation System Instrumentation," requirements for AFAS will be revised to restrict the time period that a channel may be in trip. The proposed specification would place the affected trip function in bypass or trip within 1 hour. The inoperable channel may be placed in the trip condition for up to 48 hours from the time of initial loss of operability. If OPERABILITY cannot be restored within this 48-hour period, the inoperable channel shall be placed in the bypass condition. The facility review group (FRG) shall review the desirability of maintaining this channel in the bypassed condition in accordance with Specification 6.5.1.6m.

The net effect of this revision is an imposition of a temporary period that AFAS instrument channels may be in the tripped condition (48 hours).

In addition to these material changes, an editorial change is proposed in Table 3.3-3, Item 8.b (both units) to remedy imprecise nomenclature whereby steam generator parameters are mistakenly listed under the subheader for feedwater header parameters.

JUSTIFICATION FOR THE PROPOSED CHANGE

General Description of ESFAS Instrumentation

The design of ESFAS is segmented into four sensor subsystems and two actuation subsystems. The four sensor subsystems include identical measurement channels and bistables (bistable trip units) with electrical and physical separation. Measurement channels provide input to ESFAS bistables within the same ESFAS channel. When a channel monitoring a parameter indicates an unsafe condition, the bistable monitoring the parameter in that channel will trip. Bistable trip units receive an analog input from the measurement channels, compare the analog input to trip setpoints, and provide contact output to the actuation logic that consists of two actuation subsystems. The two independent actuation subsystems (ESFAS logic) compare the four sensor subsystem outputs. If a trip occurs in the same parameter in two or more sensor subsystem channels, the two-out-of-four (2/4) logic in each actuation subsystem initiates one train of engineered safety features (ESF). It is possible to change the two-out-of-four ESFAS logic to two-out-of-three (2/3) logic for a given input parameter in one channel at a time by disabling one channel input to the logic by placing that channel in bypass. In this condition, the bistables function normally, producing normal trip indication and annunciation, but the bypassed channel input is effectively removed from the coincidence logic. This activity is usually performed for maintenance bypassing (maintenance or testing).

Three out of four measurement and bistable channels are necessary to meet the redundancy and testability requirements. The fourth channel provides additional flexibility by allowing one channel to be removed from service (channel bypass) for maintenance or testing while still maintaining a minimum two-out-of-three logic.

Significant flexibility can be achieved in a four-channel ESFAS if complete channel independence can be demonstrated. However, some flexibility is lost when two channels are dependent. In effect, one failure can disable two dependent channels. CE plants have discovered that this characteristic is particularly problematic for those ESFAS that operate on the "energize-to-actuate" principle; a scheme reserved for those functions that a plant would not want inadvertently actuated on a loss of power (e.g., containment spray, recirculation switchover). In effect, a single power failure to such a system can block one actuation channel. In addition, the two affected instrument bistables fail off, resulting in two-out-of-two (2/2) logic for the remaining actuation system. If the TS allow one of the unaffected instrument channels to be bypassed indefinitely prior to the failure, the coincidence logic could not be satisfied and the ESFAS would not "energize-to-actuate." As discussed below, such is the case for the RAS and CSAS actuation systems.

ESFAS instrumentation at St. Lucie does not achieve four channel independence. While the systems are powered by four vital buses, these buses are either backed up or powered by only two safety-related batteries. With this arrangement, a battery fault could be postulated that would fail two vital buses and result in the disabling of two ESFAS channels (i.e., RAS and CSAS). If a channel is in indefinite bypass (i.e., two-out-of-three actuation logic), then a single failure of two vital buses might result in a failure to generate an ESFAS signal when needed. The original Technical Specifications did not adequately

address failure of these power supplies and the adverse effect it might have on system coincidence and actuation.

Unit 1 UFSAR and Technical Specifications

RAS

Section 6.3.2.1.2 of the Unit 1 UFSAR describes the operation of the ECCS in recirculation mode. Section 7.3 describes ESFAS, which includes RAS. The details of RAS are described in Section 7.3.1.1.9. Section 7.3.2 includes the single failure criterion and discussion related to conformance to IEEE-279. Unit 1 UFSAR tables provide RAS parameter data, setpoint and instrument response times, and failure mode effects analyses (T7.3-1, T7.3-3, T7.3-7). During the injection phase of a LOCA, the emergency core cooling system (ECCS) pumps take suction from the refueling water tank (RWT) and inject to the reactor core (and containment). Upon reaching their respective low-level setpoint in the RWT, each of four RAS channels provide input to the ESFAS. When coincidence is achieved with two RAS channels, the RWT isolation valves are closed and the ECCS sump isolation valves are opened in a simultaneous fashion, allowing for recirculation. During the recirculation phase, the ECCS pumps (i.e., high pressure safety injection and containment spray), take their suction from the ECCS sump water inventory and inject into the core (and containment). The logic for recirculation actuation is normally two-out-of-four channels in coincidence (2/4), 2/3 with one in bypass, 1/3 with one in trip, and 1/2 with one in bypass and another in trip.

TS 3.3.2.1 requires a total of four RAS channels with a minimum of three operable channels in MODES 1, 2, and 3. If the number of OPERABLE channels is one less than the Total Number of Channels, the inoperable channel must be placed in either trip or bypass condition within one hour. A bypass of the inoperable channel (for testing or maintenance only) is limited to 48 hours from the time of initial loss of operability. However, the inoperable channel shall then be either restored to operable status or placed in the tripped condition. Within one hour, all functional units receiving input from the inoperable channel are also placed in the same condition as described above. The time limit for the inoperable channel in trip is not specified. Further, one additional channel may be bypassed (for testing or maintenance only) for up to 48 hours, provided the other inoperable channel is placed in trip.

CSAS

Unit 1 UFSAR Section 6.1.2 describes the operation of the containment spray system. Section 7.3 describes ESFAS, which includes CSAS. The details of CSAS are described in Section 7.3.1.1.10. Section 7.3.2 includes the single failure criterion and discussion related to conformance to IEEE-279. Unit 1 UFSAR tables provide CSAS parameter data, setpoint and instrument response times, and failure mode effects analyses (T7.3-1, T7.3-4,

T7.3-7). Containment pressure reduction and heat removal is required upon occurrence of a design basis accident to limit containment pressure to within the design value. The containment spray system is actuated upon CSAS. The parameters used for CSAS (containment high-high pressure and SIAS) give direct indication of a LOCA or steamline break inside containment. CSAS is initiated by a coincidence of containment high-high pressure (Unit 1 - 10 psig, Unit 2 – 5.5 psig) and SIAS. The logic for containment spray actuation is similar to RAS.

TS 3.3.2.1 requires a total of four CSAS channels with a minimum of three operable channels in MODES 1, 2, and 3. A SIAS is first necessary to enable CSAS logic. If the number of operable channels is one less than the total number of channels, the inoperable channel must be placed in the bypass condition within one hour. A bypass of the inoperable channel is not limited in time. Further, one additional channel may be placed in bypass for up to two hours for surveillance testing (normally, the inoperable channel is tripped when the additional channel is bypassed).

AFAS

Unit 1 UFSAR Section 10.5 describes the operation of the auxiliary feedwater (AFW) system. Section 7.3 describes ESFAS, which includes AFAS. The details of AFAS are described in Section 7.3.1.1.13. Section 7.3.2 includes the single failure criterion and discussion related to conformance to IEEE-279. Unit 1 UFSAR tables provide AFAS parameter data, setpoint, and instrument response times, and failure mode effects analyses (T7.3-1, T7.3-10, T13.8.2-2). A separate feedwater actuation signal (AFAS-1, AFAS-2) is generated for each steam generator (SG). For each AFAS-1 and AFAS-2, there are four independent level transmitters for SG level, four independent SG pressure transmitters, and four independent feedwater header pressure transmitters. AFAS actuation logic actuates AFW to a SG on low-level after a time delay period unless that SG or its associated feedwater supply header have been identified as being ruptured. A SG is ruptured when its pressure is approximately 275 psi below the other SG coincident with its own low-level signal and with the other SG and feedwater header being identified as not ruptured. Likewise, a feedwater supply header is ruptured when pressure is approximately 150 psi below the other feedwater supply header pressure coincident with its associated SG low-level signal and with the other SG and feedwater header being identified as not ruptured. The four protective channels of each SG AFAS are arranged into six logic "AND's," which represent all possible coincidence of two combinations. Each logic matrix is then connected in series with a set of four matrix output relays. The contacts of the matrix relays are combined into four initiation circuits, one circuit per channel per AFAS. Initiation relay outputs are combined to form the actuation logic. AFAS actuation logic is similar to RAS and CSAS.

Note, there is no design provision (i.e., switch) for placing individual differential SG pressure and/or low-level input bistables in either trip or bypass. In the St. Lucie design,

two bypass switches are provided in each measurement channel, one each for AFAS-1 and AFAS-2. These switches bypass the three bistable relay contact output signals to the matrix relay logic circuits associated with that measurement channel. Thus, the bypass switches enter into the system logic downstream of both the low SG level bistable and the rupture detection logic.

TS 3.3.2.1 requires a total of four AFAS channels per SG with a minimum of three operable channels per SG in MODES 1, 2, and 3. If the number of operable channels is one less than the total number of channels, the inoperable channel must be placed in either trip or bypass condition within one hour. If the inoperable channel is bypassed, the desirability of maintaining this channel in the bypassed condition shall be reviewed by the FRG in accordance with Specification 6.5.1.6m. If left in the trip condition, no time limit or FRG review requirement is specified. The channel shall be returned to operable status no later than during the next COLD SHUTDOWN. With the number of channels operable one less than the minimum channels operable, power operation may continue provided that one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within one hour. There are no time limits for this condition.

Unit 2 UFSAR and Technical Specifications

RAS

Unit 2 UFSAR Section 6.3.5.2.2 describes operation and initiation of RAS. Section 7.3.1.1.2 describes the details of instrumentation and control for RAS. Section 7.3.2 includes the single failure criterion and discussion related to conformance to IEEE-279. Unit 2 UFSAR tables provide RAS parameter data, setpoint and instrument response times, and failure mode effects analyses (T7.3-1, T7.3-3, T7.3-7, T13.7.2-2). The Unit 2 RAS operates as described above for Unit 1 with similar actuation/coincidence logic.

TS 3.3.2 requires a total of four RAS channels with a minimum of three operable channels in MODES 1, 2, and 3. If the number of operable channels is one less than the total number of channels, restore the inoperable channel to operable status within 48 hours or place the inoperable channel in the tripped condition and verify that the minimum channels operable requirement is demonstrated within one hour. One additional channel may be placed in bypass for up to two hours for surveillance testing per Specification 4.3.2.1. The time limit for the inoperable channel in trip is not specified.

CSAS

Unit 2 UFSAR Section 6.2.2.2.1 describes the operation of the containment spray system. Section 7.3 describes ESFAS, which includes CSAS. The details of CSAS are described in Section 7.3.1.1.3. Section 7.3.2 includes the single failure criterion and discussion

related to conformance to IEEE-279. Unit 2 UFSAR tables provide CSAS parameter data, setpoint and instrument response times, and failure mode effects analyses (T7.3-1, T7.3-4, T7.3-7, T13.7.2-2). The Unit 2 CSAS operates as described above for Unit 1 with similar actuation/coincidence logic.

TS 3.3.2 requires a total of four CSAS channels with a minimum of three operable channels in MODES 1, 2, and 3. A SIAS is first necessary to enable CSAS logic. If the number of operable channels is one less than the total number of channels, restore the inoperable channel to operable status within 48 hours or place the inoperable channel in the tripped condition and verify that the minimum channels operable requirement is demonstrated within one hour. One additional channel may be placed in bypass for up to two hours for surveillance testing per Specification 4.3.2.1. The time limit for the inoperable channel in trip is not specified.

AFAS

Unit 2 UFSAR Section 10.4.9 describes the operation of the AFW system. Section 7.3 describes ESFAS, which includes AFAS. The details of AFAS are described in Section 7.3.1.1.8. Section 7.3.2 includes the single failure criterion and discussion related to conformance to IEEE-279. Unit 2 UFSAR tables provide AFAS parameter data, setpoint and instrument response times, and failure mode effects analyses (T7.3-1, T7.3-11, T7.3-12, T13.7.2-2). The Unit 2 AFAS operates as described above for Unit 1 with similar actuation/coincidence logic.

TS 3.3.2 requires a total of four AFAS channels per SG with a minimum of three operable channels per SG in MODES 1, 2, and 3. If the number of operable channels is one less than the total number of channels, the inoperable channel must be placed in either trip or bypass condition within one hour. If the inoperable channel is bypassed, the desirability of maintaining this channel in the bypassed condition shall be reviewed by the FRG in accordance with Specification 6.5.1.6m. The channel shall be returned to operable status no later than during the next COLD SHUTDOWN. With the number of channels operable one less than the minimum channels operable, power operation may continue provided that one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within one hour. Furthermore, all functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition as specified. No time limits are specified associated with either the bypass or tripped condition.

Evaluation and Justification of Changes

Generic Considerations:

Generally, the proposed TS employ a 48-hour completion time to restore an inoperable channel of the subject ESFAS TS. When compared to the existing ESFAS TS, this time limit is more restrictive in most cases, particularly where the existing TS provide no limits at all on restoring an inoperable channel. This 48-hour completion time is based on the following principles:

a) The period is comparable to the 48-hour value used in the CE Standard Technical Specifications. According to this reference, the [48] hour completion time is based on operating experience (a qualitative judgment), which has demonstrated that a random failure of a second channel occurring during the [48] hour period is a low probability event.

b) The period is a reasonable timeframe for expected repair times for St. Lucie. A maintenance history review has found transmitter and power supply repairs that have taken about two days. The 48-hour completion time is comparable to other ESFAS instrument failure response action times.

Generally with one less than the minimum number of channels operable, the proposed TS employ a condition that operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within one hour. Then one of the inoperable channels must be restored to operable status within 48 hours or be in at least hot standby within 6 hours and in hot shutdown within the following 6 hours. Therefore, the proposed TS impose a total limit of 12 hours to be in hot shutdown (for consistency with other St. Lucie TS, the requirement is broken up into "... within 6 hours... and within the following 6 hours"). When compared to the existing ESFAS TS this time limit is more restrictive because the existing TS provide no limits at all on restoring an inoperable channel. This 12-hour completion time to hot shutdown is based on the following principles:

a) The period is comparable to the 12-hour value used in the CE STS which states that the [12] hour 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. FPL concurs with the CE STS assessment.

b) FPL judges that this time period is a reasonable timeframe for required downpowers for the St. Lucie nuclear facilities.

RAS

Primarily, the proposed RAS TS is intended to remedy the following scenario described in CE Infobulletin 97-02:

- One RAS channel indefinitely in tripped condition (coincidence logic is 1/3)
- If TS completion time is indefinite, it is prudent to apply a single failure
- If single failure is a spurious RWT level channel signal, RAS will actuate
- If actuation occurs prematurely, ECCS flow will be interrupted (an unacceptable accident)

Technical Specification Table 3.3-3 Actions 9 and 17, Unit 1 and 2 respectively, permit the placement of a channel of RWT Level Low in the tripped condition. With one channel in the tripped condition, the system is susceptible to a single failure of a second channel resulting in a RAS actuation. If this condition were to occur post-LOCA, prior to the RWT reaching the low-level setpoint, a premature RAS actuation could occur. Without adequate inventory in the containment sump, the high pressure safety injection (HPSI) pumps and containment spray pumps would have their suctions supplied by an inadequate suction source, adversely impacting the ECCS (core cooling and containment cooling safety function). This event would be of no consequence if it were to occur after the RWT has reached the low-level setpoint because the ECCS systems would already be aligned for the recirculation phase. If the failure occurred while the plant is at power, the event would be undesirable, but would not place the plant in a transient.

The proposed TS will remedy this condition by limiting the time that an RAS channel may be placed in trip or bypass. The time in trip must be limited so that we need not postulate the additional single failure that could preclude inadvertent actuation during the injection phase. Also, the time in bypass must be limited so that we need not postulate the additional single failure (vital DC bus) that adversely affects an energize-to-actuate system. The latter case could result in RAS failure to respond to a genuine demand for SI switchover. If channel OPERABILITY can not be restored within the 48-hour period, the proposed TS imposes a new restriction requiring plant shutdown comparable to the action statement specified by CE STS.

The completion time limit is established at 48 hours for the reasons discussed generically above. Forty eight hours is a reasonable time to repair any expected channel failure, and is appropriate considering the low probability for the confluence of events that must occur precisely at an inopportune moment during a very improbable event (LOCA).

Unchanged in this TS revision is the requirement to place the inoperable channel in either the trip or bypass condition within one hour. Also unchanged is the requirement that all functional units receiving an input from the inoperable channel also be placed in the same

condition (either bypassed or trip). The TS revision would remove a note from Unit 1 TS stating that the provisions of TS 3.0.4 are not applicable to the associated ACTION statement. Removal of this note is acceptable since continued noncompliance to the condition results in a shutdown to comply with the action requirements.

Consistent with the existing TS, the proposed TS provides a time period for the contingency that a second channel may be inoperable or require testing while the first channel is inoperable. The time period for a second inoperable channel is limited to two hours (The Unit 1 restriction of the temporary period that the second inoperable channel may be bypassed is changed from 48 hours to 2 hours). Having the additional RAS channel in bypass with the original inoperable channel in the trip condition does increase the risk of RAS misoperation if any one of the postulated single failures is considered; however, the RAS still provides the minimum level of performance in this configuration. The increased risk with the second inoperable channel is not significant.

CSAS

The proposed CSAS TS is intended to remedy the following postulated Unit 1 scenario:

- As allowed by Unit 1 TS, one CSAS channel indefinitely in bypass (coincidence logic is 2/3)
- If TS completion time is indefinite, it is prudent to apply an additional single failure
- If single failure is a vital DC bus failure powering two of the three remaining channels
- The remaining operable channel cannot satisfy coincidence logic, CSAS will not actuate

Technical Specification Table 3.3-3 Actions 10 and 17, Unit 1 and 2 respectively, permit the placement of a channel of containment pressure high-high in the bypass condition for Unit 1 and in the tripped condition for Unit 2. These differences are attributed to a licensing condition of Unit 1 that does not credit the fourth measurement channel, even for the de-energize-to-actuate ESFAS functions. Nevertheless, the unlimited bypass condition at Unit 1 would establish 2/3 coincidence logic for the remaining instrument channels. If a vital DC bus failure were postulated for two dependent instrument channels during the unlimited period allowed by TS, then only one channel would be available to satisfy the 2/3 coincidence logic. In other words, an unlimited bypass condition could preclude containment spray actuation.

The proposed TS will remedy this vulnerability of Unit 1 by limiting the time that a CSAS channel may be placed in bypass. The time in bypass must be limited so that we need not postulate the additional single failure (vital DC bus) that adversely affects this energize-to-actuate system. If channel OPERABILITY can not be restored within the 48-hour period, the proposed TS imposes a new restriction requiring the inoperable channel to be placed

in trip for an unlimited period. Further restrictions (i.e., requiring plant shutdown) on this condition are not warranted because postulating any credible single failure while the coincidence logic is 1/3 can not preclude CSAS actuation for genuine accident conditions.

Of the ESFAS changes proposed herein, this unlimited trip condition allowed for CSAS is uniquely provided because there are no single failure scenarios from this configuration that pose a nuclear safety concern, as described below.

The CSAS circuits are designed using the energize-to-actuate principle to prevent spurious initiation resulting from loss of power scenarios. This design principle is applied to actuation relays, instrument loop, and bistable circuits. Furthermore, the CSAS logic circuit employs a SIAS permissive signal that further reduces the possibility of spurious actuation. Although spurious CSAS actuation is undesirable, it is not a concern from a nuclear safety perspective. Placing one channel of CSAS indefinitely in trip, as allowed by Unit 2 TS, effectively puts CSAS in 1/3 actuation logic. A subsequent single failure could result in spurious actuation of containment spray. Circuit design is such that a power failure, including a DC bus failure, will not result in a spurious actuation, nor will it prevent proper actuation by the remaining channel. The SIAS permissive will also prevent unwarranted CSAS actuation in most cases. With particular credit for this SIAS permissive (which will preclude inadvertent CSAS actuation for an additional single failure) and the non-nuclear safety significance of inadvertent spray, the TS provision for having one CSAS channel in trip for an unlimited period is justified.

The completion time limit is established at 48 hours for the reasons discussed generically above. Forty eight hours is a reasonable time to repair any expected channel failure, and is appropriate considering the low probability for the confluence of events that must occur precisely at an inopportune moment during a very improbable event (LOCA or steamline break).

Comparable to the CE STS and existing TS, the proposed TS provides a time period for the contingency that a second channel may be inoperable or require testing while the first channel is inoperable. This time period is comparable to the 48-hour completion time provided for the first inoperable channel, and is justified on the same basis as that period. Having the additional CSAS channel in bypass with the original inoperable channel in trip does increase the risk of CSAS misoperation if any one of the postulated single failures is considered; however, the CSAS still provides the minimum required level of performance in this configuration. The increased risk with the second inoperable channel is not significant.

The discussion above provides justification for Unit 1 changes to CSAS instrumentation. Changes to the Unit 2 CSAS instrumentation is in format only. An appropriate symbol is also added to both units to note the exception to TS 3.0.4. This is comparable to the other exceptions identified in TS Table 3.3-3. Since placing the facility in a higher mode of

operation with a inoperable channel does not adversely affect plant safety and continued noncompliance to these conditions does not result in a shutdown to comply with the action requirements if a change in mode were permitted, the exception to TS 3.0.4 is acceptable.

AFAS

Technical Specification Table 3.3-3 Actions 13 and 14 (both units) permit the placement of a channel of an AFAS (and AFW isolation) in the tripped or bypassed condition indefinitely. The associated instrument channels include steam generator low level, steam generator A/B differential pressure, and feedwater header A/B differential pressure. These instrument channels contribute to the actuation logic represented by AFAS-1 and AFAS-2. The proposed AFAS TS is intended to remedy single failure vulnerabilities created. Below, the indefinite trip vulnerability/remedy is discussed below.

- In response to an identified failure, the channel A AFAS-1 feedwater header A differential pressure rupture detection logic bistable output (FWH-A < FWH-B) is placed in the trip condition indefinitely per the TS. (coincidence logic is 1/3)
- If TS completion time is indefinite, it is prudent to apply a single failure
- An event is initiated by rupture of the opposite feedwater header (B), and the low-level setpoint is reached in both steam generators.
- A single failure in another rupture detection channel (channel B) results in a second AFAS-1 feedwater header A differential pressure rupture detection logic bistable output signal (FWH-A < FWH-B).

For this scenario, the AFAS-1 output signals from channels A and B are blocked by the rupture detection logic (due to the initial condition and postulated failure). However, AFAS-1 output signals will be generated by channels C and D, and auxiliary feedwater will be supplied to steam generator B. AFAS-2 output signals from channels C and D will be correctly blocked by the B feedwater header rupture detection logic. The problem is that the AFAS-2 output signals from channels A and B will not be blocked because the AFAS-1 rupture signals in these measurement channels are already locked-in (recall that the rupture detection logic is mutually exclusive to ensure that AFW is supplied to at least one steam generator). Therefore, contrary to the safety analysis, the postulated single failure would result in AFW being supplied to the ruptured feedwater header B.

Below the indefinite bypass scenario is discussed:

- Channel A differential pressure for SG-A rupture detection logic bistable output (FWH-A < FWH-B) fails in a manner that indicates SG-A rupture. In response, assume that only AFAS-1 channel A is placed in bypass. With this identified bistable failure, AFAS-2 channel A is precluded from indicating a rupture on SG-B.

- An event is initiated by the rupture in the feedwater header piping of SG-B, and the low-level setpoint is reached in both steam generators.
- A single failure is postulated that results in no output signal being generated by the channel B AFAS-2 rupture detection bistable (FWH-A < FWH-B).

In this scenario, AFAS-1 channels B, C, and D all actuate to initiate AFW to SG-A and AFAS-2 channels A and B actuate to initiate AFW to SG-B. Therefore, contrary to the safety analysis, the postulated single failure would result in feeding the ruptured B steam generator. This scenario is prevented if both the AFAS-1 and AFAS-2 logic circuits of the failed channel are bypassed. Therefore, indefinite bypass is acceptable and prudent for a failed transmitter inside containment.

The proposed TS will remedy the above condition for indefinite trip by limiting the time that an AFAS channel may be placed in trip. The time in trip must be limited so that we need not postulate the additional single failure that could cause feeding a faulted feedwater header. If channel OPERABILITY can not be restored within the 48-hour period, the inoperable channel shall be placed in the bypass condition (both AFAS-1 and AFAS-2 in the affected channel placed in bypass).

The proposed completion time limit is established at 48 hours for the reasons discussed generically above. Forty eight hours is a reasonable time to repair any expected channel failure, and is appropriate considering the low probability for the confluence of events that must occur precisely at an inopportune moment during a very improbable event (feedwater or steamline break).

Unchanged in this TS revision is the requirement to place the inoperable channel in either the trip or bypass condition within one hour. Review by the FRG in accordance with Specification 6.5.1.6m for the desirability of maintaining this channel in the bypassed condition is retained. An appropriate symbol is also added to both units to note the exception to TS 3.0.4. This is comparable to the other exceptions identified in TS Table 3.3-3. Since placing the facility in a higher mode of operation with a inoperable channel does not adversely affect plant safety, and continued noncompliance to these conditions does not result in a shutdown to comply with the action requirements if a change in mode were permitted, the exception to TS 3.0.4 is acceptable.

The proposed TS provides a time period for the contingency that a second channel may be inoperable or require testing while the first channel is inoperable. This time period is comparable to the 48-hour completion time provided for the first inoperable channel, and is justified on the same basis as that period. Having the additional AFAS channel in bypass or trip does increase the risk of AFAS misoperation if any one of the postulated single failures is considered; however, the AFAS still provides the minimum required level of performance in this configuration. The increased risk with the second inoperable channel is not significant.

Safety Significance

If a Technical Specification were to specify an inappropriate state of ESFAS, the resulting configuration could block the ESFAS function from properly responding to an accident, or it could cause spurious actuation of the function. However, the proposed changes only deal with limiting the time that certain ESFAS instrument channels and logic systems are in bypass or tripped conditions; conditions that are currently allowed by TS. There is no adverse safety significance of the amendments because the proposed changes do not allow any new ESFAS configurations.

CONCLUSION

The proposed Technical Specification changes governing the subject ESFAS functions are acceptable because they are generally more restrictive than current TS. They consider failure modes not previously accommodated, and they are comparable to the CE STS.

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Description of amendment request: The proposed license amendments (PLAs) to Facility Operating Licenses DPR-67 for St. Lucie Unit 1 and NPF-16 for St. Lucie Unit 2 will limit the period of time that inoperable recirculation actuation signal (RAS), containment spray actuation signal (CSAS), and auxiliary feedwater actuation signal (AFAS) input channels could be in the bypass and/or tripped condition in order to maintain the functional capability and performance levels of equipment required for the safe operation of St. Lucie Units 1 and 2.

Pursuant to 10 CFR 50.92, a determination may be made that a proposed license amendment 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; (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. Each standard is discussed as follows.

1) Would operation of the facility in accordance with the proposed amendments involve a significant increase in the probability or consequences of an accident previously evaluated?

   No, facility operation under the new Technical Specification (TS) restrictions would not increase the probability of occurrence of any accident previously evaluated. The proposed changes only affect the ESFAS functions of RAS, CSAS, and AFAS; generally limiting the time that any instrument channel may be inoperable in a bypassed or tripped condition. No physical plant changes are proposed in conjunction with these revisions. The proposed changes to RAS and AFAS channel operability greatly reduce the time that actuation systems are vulnerable to spurious, inadvertent actuation. The proposed changes do allow a new unlimited time for trip of one CSAS channel on Unit 1. Although this increases the possibility of a spurious channel trip with a potential for causing an inadvertent spray actuation, this is offset by the increased reliability of spray in this configuration. Unit 2 already contains provision for the indefinite single channel trip of CSAS, and this change will also make the two units similar. Additionally, it is important to note that inadvertent actuation of any of these functions (RAS, CSAS, or AFAS) during plant operation is not an accident initiating event. Therefore, with no physical effects on the plant and no increase in probability that the subject ESFAS functions will initiate an accident, there is no increased probability that any previously evaluated accident will occur. The changes provided in this safety evaluation do not affect the assumptions or results of any accident evaluated in the UFSAR.

Likewise, the consequences of any accident previously evaluated have not been increased. The proposed changes, by limiting the time that ESFAS functions are inoperable, will increase the reliability of the associated ESFAS functions to respond to accidents. In particular, the revision to the RAS TS will limit the time that the RAS will be vulnerable to single failure and will therefore improve the system reliability during an accident. As these proposed changes constitute no physical change to the facility and only serve to increase ESF function reliability, FPL concludes that the consequences of previously evaluated accidents are not increased. The ability of the ESFAS to respond to accident conditions as assumed in any accident analysis has not been affected.

2) Would operation of the facility in accordance with the proposed amendments create the possibility of a new or different kind of accident from any accident previously evaluated?

No, the proposed activity does not create the possibility of an accident of a different type than any previously evaluated. The proposed changes only affect the ESFAS functions of RAS, CSAS, and AFAS; generally limiting the time that any instrument channel may be inoperable in a bypassed or tripped condition. No physical plant changes are proposed in conjunction with these revisions. Thereby, the proposed changes do not create any new equipment interfaces, equipment response characteristics, or operating configurations. Without creation of a new interaction of materials, operating configuration, or operating interface, there is no possibility that the proposed changes can introduce a new or different kind of accident.

3) Would operation of the facility in accordance with the proposed amendments involve a significant reduction in a margin of safety?

The margin of safety as defined in the basis for any Technical Specification or in any licensing document has not been reduced. The TS Bases for the associated ESF LCO do not explicitly discuss a related margin of safety. However, by virtue of the increased ESFAS reliability provided by the proposed amendments, it is evident that the margin of safety will not be reduced in any manner.

Based on the determination made above, it is concluded that the proposed amendments do not involve any significant hazards.

Environmental Consideration

The proposed license amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The proposed amendments involve no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite, and no significant increase in individual or cumulative occupational radiation exposure. FPL

concluded that the proposed amendments involve no significant hazards consideration and meet the criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and that, pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment need not be prepared in connection with issuance of the amendments.

Conclusion

FPL concludes, based on the considerations discussed above, that (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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

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TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. SAFETY INJECTION (SIAS)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	8
b. Containment Pressure – High	4	2	3	1, 2, 3	9#
c. Pressurizer Pressure – Low	4	2	3	1, 2, 3(a)	9#
2. CONTAINMENT SPRAY (CSAS)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	8
b. Containment Pressure – High-High	4	2(b)	3	1, 2, 3	10#
3. CONTAINMENT ISOLATION (CIS)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	8
b. Containment Pressure – High	4	2	3	1, 2, 3	9#
c. Containment Radiation – High	4	2	3	1, 2, 3, 4	9#
d. SIAS	(See Functional Unit 1 above)				
4. MAIN STEAM LINE ISOLATION (MSIS)					
a. Manual (Trip Buttons)	2/steam generator	1/steam generator	2/operating steam generator	1, 2, 3, 4	8
b. Steam Generator Pressure – Low	4/steam generator	2/steam generator	3/steam generator	1, 2, 3(c)	9#

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
5. CONTAINMENT SUMP RECIRCULATION (RAS)					
a. Manual RAS (Trip Buttons)	2	1	2	1, 2, 3, 4	8
b. Refueling Water Tank - Low	4	2	3	1, 2, 3	~~9#~~ 13
6. LOSS OF POWER					
a. 4.16 kv Emergency Bus Under-voltage (Loss of Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12
b. 4.16 kv Emergency Bus Under-voltage (Degraded Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12
c. 480 V Emergency Bus Under-voltage (Degraded Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12
7. AUXILIARY FEEDWATER (AFAS)					
a. Manual (Trip Buttons)	4/SG	2/SG	4/SG	1, 2, 3	11
b. Automatic Actuation Logic	4/SG	2/SG	3/SG	1, 2, 3	8
c. SG Level (1A/1B) - Low	4/SG	2/SG	3/SG	1, 2, 3	~~13#, 14~~ 14 #
8. AUXILIARY FEEDWATER ISOLATION					
a. SG 1A – SG 1B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	~~13#, 14~~ 14 #
b. Feedwater Header ~~SG~~ 1A – ~~SG~~ 1B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	~~13#, 14~~ 14 #

TABLE 3.3-3 (continued)

Replace with new ACTION 10

TABLE NOTATION

ACTION 10 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the inoperable channel is placed in the bypassed condition and the Minimum Channels OPERABLE requirement is demonstrated within 1 hour; one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.1.

ACTION 11 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channels to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION 12 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed until performance of the next required CHANNEL FUNCTIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour

Replace with new ACTION 13

ACTION 13 - With the number of channels OPERABLE one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may continue provided the inoperable channel is placed in the bypassed or tripped condition within 1 hour. If the inoperable channel is bypassed, the desirability of maintaining this channel in the bypassed condition shall be reviewed in accordance with Specification 6.5.1.6m. The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN.

ACTION 14 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, STARTUP and/or POWER OPERATION may continue provided that one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour.

Replace with new ACTION 14

Replace current ACTION Statement 10 (for CSAS) with the following:

ACTION 10 With the number of channels OPERABLE one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. The inoperable channel may be bypassed for up to 48 hours from time of initial loss of OPERABILITY. If OPERABILITY can not be restored within this 48-hour period, the inoperable channel shall be placed in the tripped condition.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also placed in the same condition (either bypassed or tripped, as applicable) as that required by a. above for the inoperable channel.

c. With the number of channels OPERABLE one less than the Minimum Channels Operable, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

Replace current ACTION Statement 13 with the following:

ACTION 13 With the number of channels OPERABLE one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. If OPERABILITY can not be restored within this 48-hour period, be in HOT STANDBY in 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also placed in the same condition (either bypassed or tripped, as applicable) as that required by a. above for the inoperable channel.

c. One additional channel may be bypassed for up to 2 hours while performing tests and maintenance on that channel provided the other inoperable channel is placed in the tripped condition.

Replace current ACTION Statement 14 (for AFAS) with the following:

ACTION 14 With the number of channels OPERABLE one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. If OPERABILITY can not be restored within this 48-hour period, both AFAS-1 and AFAS-2 in the inoperable channel shall be placed in the bypass condition. The Facility Review Group (FRG) shall review the desirability of maintaining this channel in the bypassed condition in accordance with Specification 6.5.1.6m.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also placed in the same condition (either bypassed or tripped, as applicable) as that required by a. above for the inoperable channel.

c. With the number of channels OPERABLE one less than the Minimum Channels Operable, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

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TABLE 3.3-3

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. SAFETY INJECTION (SIAS)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	12
b. Containment Pressure – High	4	2	3	1, 2, 3	13*, 14
c. Pressurizer Pressure – Low	4	2	3	1, 2, 3(a)	13*, 14
d. Automatic Actuation – Logic	2	1	2	1, 2, 3, 4	12
2. CONTAINMENT SPRAY (CSAS)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	12
b. Containment Pressure – High-High	4	2	3	1(b), 2(b), 3(b)	~~17~~ 18*
c. Automatic Actuation Logic	2	1	2	1, 2, 3, 4	12
3. CONTAINMENT ISOLATION (CIAS)					
a. Manual CIAS (Trip Buttons)	2	1	2	1, 2, 3, 4	12
b. Safety Injection (SIAS)	See Functional Unit 1 for all Safety Injection Initiating Functions and Requirements				
c. Containment Pressure – High	4	2	3	1, 2, 3	13*, 14
d. Containment Radiation – High	4	2	3	1, 2, 3	13*, 14
e. Automatic Actuation Logic	2	1	2	1, 2, 3, 4	12

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
4. MAIN STEAM LINE ISOLATION (MSIS)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3	16
b. Steam Generator Pressure – Low	4/steam generator	2/steam generator	3/steam generator	1, 2, 3(c)	13*, 14
c. Containment Pressure – High	4	2	3	1, 2, 3	13*, 14
d. Automatic Actuation Logic	2	1	2	1, 2, 3	12
5. CONTAINMENT SUMP RECIRCULATION (RAS)					
a. Manual RAS (Trip Buttons)	2	1	2	1, 2, 3, 4	12
b. Refueling Water Storage Tank - Low	4	2	3	1, 2, 3	~~17~~ 19
c. Automatic Actuation Logic	2	1	2	1, 2, 3	12

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
6. LOSS OF POWER (LOV)					
a. (1) 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	17
(2) 480 V Emergency Bus Undervoltage (Loss of Voltage)	3/Bus	2/Bus	2/Bus	1, 2, 3	17
b. (1) 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	3/Bus	2/Bus	2/Bus	1, 2, 3	17
(2) 480 V Emergency Bus Undervoltage (Degraded Voltage)	3/Bus	2/Bus	2/Bus	1, 2, 3	17
7. AUXILIARY FEEDWATER (AFAS)					
a. Manual (Trip Buttons)	4/SG	2/SG	4/SG	1, 2, 3	15
b. Automatic Actuation Logic	4/SG	2/SG	3/SG	1, 2, 3	12
c. SG Level (2A/2B) – Low	4/SG	2/SG	3/SG	1, 2, 3	~~13*, 14~~ 20
8. AUXILIARY FEEDWATER ISOLATION					
a. SG 2A – SG 2B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	~~13*, 14~~ 20
b. Feedwater Header ~~SG~~ 2A – ~~SG~~ 2B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	~~13*, 14~~ 20

Insert the following new ACTION Statements:

ACTION 18 With the number of channels OPERABLE one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. The inoperable channel may be bypassed for up to 48 hours from time of initial loss of OPERABILITY. If OPERABILITY can not be restored within this 48-hour period, the inoperable channel shall be placed in the tripped condition.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also placed in the same condition (either bypassed or tripped, as applicable) as that required by a. above for the inoperable channel. Functional units are listed in ACTION 13.

c. With the number of channels OPERABLE one less than the Minimum Channels Operable, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION 19 With the number of channels OPERABLE one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. If OPERABILITY can not be restored within this 48-hour period, be in HOT STANDBY in 6 hours and in HOT SHUTDOWN in the following 6 hours.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also placed in the same condition (either bypassed or tripped, as applicable) as that required by a. above for the inoperable channel. Functional units are listed in ACTION 13.

c. One additional channel may be bypassed for up to 2 hours while performing tests and maintenance on that channel provided the other inoperable channel is placed in the tripped or bypassed condition.

ACTION 20 With the number of channels OPERABLE one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. If OPERABILITY can not be restored within this 48-hour period, both AFAS-1 and AFAS-2 in the inoperable channel shall be placed in the bypass condition. The Facility Review Group (FRG) shall review the desirability of maintaining this channel in the bypassed condition in accordance with Specification 6.5.1.6m.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also placed in the same condition (either bypassed or tripped, as applicable) as that required by a. above for the inoperable channel. Functional units are listed in ACTION 13.

c. With the number of channels OPERABLE one less than the Minimum Channels Operable, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.