Withhold Enclosure, Attachment 2 from public disclosure under 10 CFR 2.390

Nuclear Operating Company

South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

February 4, 2008
NOC-AE-07002212
G25, D43.02
10CFR50.90
10CFR50.48

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
License Amendment Request for Deviation from Fire Protection Program Requirements

Pursuant to 10 CFR 50.90, STP Nuclear Operating Company (STPNOC) hereby requests a licensee amendment for deviation from STPNOC Fire Protection Program Requirements. Specifically, a deviation from certain requirements of 10 CFR 50, Appendix R, Section III.L.1. is requested to credit the performance of specific operations in the control room in the event a fire requires evacuation. These operations will ensure that the reactor coolant system (RCS) process variables remain within those values predicted for a loss of normal a-c power, as required by 10 CFR 50, Appendix R, Section III.L.1. The attached safety evaluation demonstrates that no significant hazards will result from this change.

The STPNOC Plant Operations Review Committee has reviewed and concurred with the proposed change.

In accordance with 10 CFR 50.91(b), STPNOC is notifying the State of Texas of this request for license amendment by providing a copy of this letter and its enclosure. A No Significant Hazards Consideration Determination is provided in the enclosure to this letter.

Upon approval of this request, the approved deviation will be documented in the Fire Hazards Analysis Report. A summary of commitments is provided in the Enclosure Attachment 3.

It is requested that this license amendment request be approved by January 15, 2009 with a 60 day implementation period to provide time to revise STPNOC licensing documents.

STPNOC requests that Enclosure, Attachment 2 be withheld from public disclosure in accordance with 10 CFR 2.390.

A006
NRR

STI: 32206793

If there are any questions regarding this amendment request, please contact Ken Taplett at (361) 972-8416 or me at (361) 972-7867.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 4 FEB 08

David W. Rencurrel
Vice President,
Engineering and Strategic Projects

Enclosure: Evaluation of the Proposed Change

cc:
(paper copy)

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064

Mohan C. Thadani
Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North (MS 7 D1)
11555 Rockville Pike
Rockville, MD 20852

Senior Resident Inspector
U. S. Nuclear Regulatory Commission
P. O. Box 289, Mail Code: MN116
Wadsworth, TX 77483

Richard A. Ratliff
Bureau of Radiation Control
Texas Department of State Health Services
1100 West 49th Street
Austin, TX 78756-3189

C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

(electronic copy)

A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP

Mohan C. Thadani
U. S. Nuclear Regulatory Commission

Thad Hill
Eddy Daniels
Marty Ryan
Robert Bailey
Steve Winn
NRG South Texas LP

Ed Alarcon
J. J. Nesrsta
R. K. Temple
Kevin Pollo
City Public Service

Jon C. Wood
Cox Smith Matthews

C. Kirksey
City of Austin

ENCLOSURE

Evaluation of the Proposed Change

Subject: License Amendment Request for Deviation from Fire Protection Program Requirements

1.0 SUMMARY DESCRIPTION

2.0 DETAILED DESCRIPTION

3.0 TECHNICAL EVALUATION

4.0 REGULATORY EVALUATION

5.0 ENVIRONMENTAL CONSIDERATION

6.0 REFERENCES

ATTACHMENTS:

1. Credited control room operations time line and predicted plant thermal-hydraulic performance
2. Annotated Fire Hazards Analysis Report Page **(NOT FOR PUBLIC DISCLOSURE)**
3. List of Commitments

Evaluation of the Proposed Change

1.0 Summary Description

This evaluation supports a request to amend Operating Licenses NPF-76 and NPF-80 for the South Texas Project (STP), Units 1 and 2.

The proposed change would revise the Operating Licenses to deviate from certain STP Fire Protection Program Requirements. The reason for this amendment is to credit the performance of specific operations in the control room in the event a fire requires evacuation. Thermal- hydraulic analysis demonstrate that these operations will ensure that the reactor coolant system (RCS) process variables remain within those values predicted for a loss of normal a-c power, as required by 10 CFR 50, Appendix R, Section III.L.1.

The proposed schedule is to allow the Nuclear Regulatory Commission (NRC) sufficient time to review and approve this amendment request and for STP to revise licensing documents.

2.0 Detailed Description

2.1 Current STP Alternative Shutdown Capability

Alternate shutdown capability is provided to respond to a fire occurring within the main control room. Following reactor trip from the control room, the transfer of control from the control room to the auxiliary shutdown panel and local control stations is accomplished from outside the control room using transfer switches. When transferred, these circuits are independent of the control room.

The alternate shutdown capability provides direct reading and controls to monitor the process variables necessary to perform reactivity control, reactor coolant makeup and inventory control, and reactor heat removal.

The NRC review of the STP alternative shutdown capability is documented in NUREG-0781, "Safety Evaluation Report related to the operation of the South Texas Project, Units 1 and 2." The following discussion regarding the performance of actions prior to control room evacuation is documented in Supplement 2, dated January 1987.

> "In addition to scramming the reactor from the control room, the applicant has included procedures for other actions that are to be performed before the control room is evacuated.

These actions, however, can be performed outside the control room regardless of circuit damage within the control room. They include tripping the reactor coolant pumps, closing the PORV block valves, isolating the steam generators, and securing the charging pumps. The above actions could prevent a very unlikely series of events, which include spurious actuations, the failure of specific automatic functions, and the operation of other specific automatic functions, from causing RCS process variables to exceed those limits predicted for a loss of normal ac power."

2.2 Proposed Revision to STP Alternative Shutdown Capability

During the last triennial inspection (Reference 6.1) of the STP Fire Protection Program (FPP), the South Texas Project Nuclear Operating Company (STPNOC) received a non-cited violation of 10 CFR Part 50, Appendix R, Section III.L.1, because the facility's thermal-hydraulic analysis was inconsistent with actions allowed in the STP licensing basis for a control room evacuation. Specifically, the analysis inappropriately allowed four additional manual actions to be performed from the control room while the licensing basis credited only one manual action to be performed prior to evacuating the control room. Performing the additional actions inside the control room ensures that the reactor coolant system (RCS) process variables remained within those values predicted for a loss of normal ac power at STP, as shown by the thermal-hydraulic analysis results provided in Attachment 1 to this Enclosure. This proposed amendment is needed to resolve this issue.

The STP FPP is described in the Fire Hazards Analysis Report (FHAR). Although STP is not an Appendix R plant, the FHAR states that STP will meet the requirements of 10 CFR 50, Appendix R, Section III.L.1 unless a deviation from those requirements is justified. The STP Alternate Shutdown Capability is described in Section 2.4.4 of the FHAR. Section 2.4.4 only credits operator action to manually trip the reactor from the control room prior to evacuation. STP requests approval to credit additional operations from the control room prior to evacuation to ensure that the RCS process variables remain within those values predicted for a loss of normal a-c power, as required by 10 CFR 50, Appendix R, Section III.L.1. These actions assure that the performance goals of Section III.L. 2 of 10 CFR 50, Appendix R are met.

The specific deviation from Section III.L.1 credits the performance of certain operations within the control room and relies on circuits within the same fire area (i.e., the control room) of redundant trains of systems to achieve hot shutdown that do not satisfy the circuit separation protection requirements of Appendix R, Section III.G.2. The operations are backed up outside the control room with alternative circuits by transferring control to local control stations outside of the control room as allowed by Appendix R, Section III.G.3. The actions backed up outside the control room have been previously reviewed and approved by the Nuclear Regulatory Commission (NRC) by the safety evaluation report discussed in Section 2.1 of this enclosure.

In addition to manually tripping the reactor, the following operator actions are required to be performed within the control room prior to evacuation:

1. Main steam line isolation
2. Closing the pressurizer power-operated relief valves (PORV) block valves
3. Securing all reactor coolant pumps
4. Feedwater isolation
5. Letdown isolation
6. Securing the charging pumps

Backup actions are performed outside the control room for the above actions within 10 minutes of initiating a reactor trip with the exception of backing up the tripping of the reactor coolant pumps which are performed within 30 minutes following reactor trip. The backup action to de-energize the reactor coolant pumps is not time critical since multiple spurious actuations would have to occur for an adverse impact to occur, as discussed in Section 3.5.1. Although the backup actions are performed outside the control room, the design basis thermal-hydraulic analysis credits the actions performed prior to evacuation of the control room.

In addition, an automatic main turbine trip is credited upon initiation of the manual reactor trip.

The annotated FHAR pages affected by this proposed change are provided in Attachment 2.

Upon approval of this request, the approved deviation will be documented in the STP FHAR.

3.0 Technical Evaluation

3.1 Introduction

This evaluation provides the basis for a deviation from the STP licensing basis position to meet the requirements of 10 CFR 50, Appendix R, Section III.L.1. The deviation requests approval to credit additional operations from the control room prior to evacuation to ensure that the RCS process variables remain within those values predicted for a loss of normal a-c power, as required by 10 CFR 50, Appendix R, Section III.L.1.

Nuclear Regulatory Commission (NRC) Generic Letter (GL) 86-010, "Implementation of Fire Protection Requirements," provides guidance on acceptable methods of satisfying regulatory requirements. Section 3.8.4 of Enclosure 2 to GL 86-010 covers control room fire considerations. The only operator action in the control room prior to evacuation usually given credit for is the reactor trip. For any additional control room actions deemed necessary prior to evacuation, a demonstration of the capability of performing such actions would have to be provided. Additionally, assurance would have to be provided that such actions could not be negated by subsequent spurious actuation signals from the postulated fire.

Additionally, Section 5.3.10 of Enclosure 2 to GL 86-010 states that when considering plant transients in the design of the alternative or dedicated shutdown systems, the following are the usual assumptions:

1. A loss of offsite power shall be assumed concurrent with the fire,
2. The safe shutdown capability should not be adversely affected by any one spurious actuation or signal resulting from a fire,
3. The safe shutdown capability should not be adversely affected by a fire which results in the loss of all automatic function from circuits located in the area with one worst case spurious actuation or signal resulting from a fire, and
4. The safe shutdown capability should not be adversely affected by a fire which results in spurious actuation of the redundant valves in any one high-low pressure interface line.

Thermal-hydraulic analyses were performed for the case where a loss of offsite power occurs and for the case where a loss of offsite power does not occur. The case where a loss of offsite power does not occur is more limiting. This is because the startup feed pump will start and present an overcooling challenge until mitigated.

In summary, a detailed fire hazards analysis performed by STP demonstrates that the performance of additional operations in the control room are necessary, that the operations can be completed in a short period of time, and that reasonable assurance exists that the operations will not be negated by subsequent spurious actuation signals from a postulated fire. The crediting of additional operations in the control room ensures that the requirements of 10 CFR 50, Appendix R, Section III.L.1 are met.

3.2 Control Room Operator Actions: The revised plant procedure will require completion of the following actions within the control room prior to evacuation in the event of a fire:

- Trip the reactor
- Initiate main steam isolation
- Close all pressurizer power-operated relief valve (PORV) block valves
- Trip all reactor coolant pumps
- Initiate feedwater isolation
- Isolate letdown
- Place centrifugal charging pumps in PULL TO LOCK (i.e., secure charging)

The additional actions to be credited are required for the following reasons:

Main steam isolation – must be accomplished to ensure that an uncontrolled cool down does not occur.

Closing all pressurizer PORV block valves – must be accomplished to mitigate a fire-induced spurious actuation opening the pressurizer PORV and resulting an uncontrolled RCS depressurization and a loss of RCS inventory.

Tripping the reactor coolant pumps – necessary to prevent uncontrolled RCS de-pressurization due to spurious operation of the pressurizer spray valves. The RCPs provide the driving head for pressurizer spray flow.

Feedwater isolation - must be accomplished to minimize cool down of the RCS and to retain control of steam generator level. Mitigates the automatic start of the startup feed pump, for the Case where offsite power is not lost, that occurs when the steam generator feed pumps trip following main steam isolation.

Letdown isolation – must be accomplished because charging is secured.

Secure charging – must be accomplished because spurious closure of a volume control tank isolation valve may starve the charging pumps. Also, securing the centrifugal charging pumps prevents a loss of RCS pressure control by the spurious opening of the auxiliary spray valve.

Although time may be limited to prepare for performing the operator actions due to the unpredictability of fire progression leading to a decision to evacuate the control room, operators will be pre-alerted to perform these actions because the actions are not required until the reactor is manually tripped. Operator walk down performance data indicates that these actions can be performed in rapid succession following the initiation of the reactor trip to support the time line assumed in the thermal-hydraulic analysis. These actions ensure that the RCS process variables remained within those values predicted for a loss of normal ac power at STP

The time line assumed in the thermal-hydraulic analysis for the credited control room operations and the predicted plant thermal-hydraulic performance is provided in Attachment 1.

3.3 Crediting Automatic Turbine Trip

This request proposes to allow the crediting of an automatic turbine trip upon a manual trip of the reactor. The crediting of automatic functions in the fire area is not normally allowed in fire hazards analysis as discussed in Section 3.1. STP reactor trip circuitry sends a signal to trip the main turbine upon initiation of a reactor trip. This occurs almost instantaneously. Once tripped, circuitry failures caused by a fire will not result in a restart of the turbine. Since the performance of a manual reactor trip has already been approved as part of the STP licensing basis, it is reasonable that the credited reactor trip circuitry would successfully function to trip the main turbine in addition to tripping the reactor. Additional justification for crediting this feature is provided in Section 3.5.2. An automatic turbine trip will prevent a rapid cool down of the RCS so that pressurizer level remains within the indicating range.

3.4 Feasibility and Reliability of the Control Room Operator Actions

This proposal credits the performance of operator actions within the control room until they can be backed up outside the control room with alternative circuits by transferring control to local control stations outside of the control room. The proposal relies on circuits within the same fire area (i.e., the control room) of redundant trains of systems to achieve hot shutdown that do not satisfy the circuit separation protection requirements of Appendix R, Section III.G.2. Therefore, a feasibility and reliability assessment of the operator actions is provided.

NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," (Reference 6.2) provides technical guidance to assist in determining that operator manual actions are feasible and can be performed reliably in response to fire. The NUREG report provides criteria for analyzing the feasibility and reliability of operator manual actions to achieve safe shutdown. The following provides the STP analysis of these criteria for justifying the operator manual actions specified in this proposal.

Criterion 1: Analysis Showing Adequate Time Available to Perform the Actions to Address Feasibility

Adequate time must be available to allow the actions to be diagnosed and executed in order to achieve and maintain hot shutdown following a single fire. The plant's thermal-hydraulic response must be analyzed to validate that the actions ensure that the safety functions can be performed.

STPNOC Evaluation: The initiation of a fire in the control room will be rapidly diagnosed by the control room operators. Progression of the fire and the need for evacuation should be readily apparent so that time will be available to prepare for performing the actions. Once a decision to evacuate the control room is made, the control room operator uses a procedure to direct the actions to be taken. The operator can be staged to rapidly perform the actions because their initiation is not required until direction is made to manually trip the reactor. Operator walk down performance data indicates that these actions can be performed within 80 seconds following initiation of the reactor trip which is within the analysis and of a short duration that does not impede evacuation of the control room.

In conclusion, adequate time is available to perform the operator manual actions thus demonstrating that the actions are feasible.

Criterion 2: Analysis Showing Adequate Time Available to Ensure Reliability

For feasible actions to be performed reliably, it should be shown that there is adequate time available to account for uncertainties in estimates of the time available and in estimates of how long it takes to diagnose and execute the operator manual actions. Sources of uncertainty that were analyzed are discussed below.

STPNOC Evaluation: The walk through demonstration indicates that there is a relatively low margin. The following discussion provides assurance that this margin can be met.

The initiation and progression of a fire in the control room will be rapidly diagnosed by the control room operators. Although the operator actions must be performed rapidly, the operator should have time to be ready to proceed when the decision is made to manually trip the reactor. The actions can be performed by a single operator in the control room at adjacent panels (see Figure 1). The actions involve operations performed in response to other emergency operations that the operators are routinely trained to perform.

In conclusion, adequate time is available to ensure that the actions can be performed reliably.

Criterion 3: Environmental Factors

Environmental conditions may affect an individual's mental or physical performance such that they may be degraded. The expected environmental conditions considered both the locations where the operator manual actions are performed and the access route to the area.

STPNOC Evaluation: A fire in the control room that is progressing to a condition where control room evacuation is required will result in a stressful environment for the control room operators. However, the operators are in an area that they routinely perform plant operations and they are trained to perform in emergency conditions. The required actions for the control room evacuation are many of the same actions that operators routinely train on in the performance for other emergencies (i.e, the actions are not unique to control room evacuation).

No special protective clothing is required to perform the actions. Sufficient emergency lighting exists in the control room. The actions can be performed using normal face-to-face communications. The actions can be performed by a single operator in the control room from adjacent panels

In conclusion, the environmental conditions in the control room will not impede the performance of the required operator actions and support the feasibility and reliability evaluation.

Criterion 4: Equipment Functionality and Accessibility

The equipment necessary to achieve and maintain post-fire hot shutdown is accessible, and not damaged or otherwise adversely affected by the fire and its effects.

STPNOC Evaluation: This proposal credits the integrity of the circuitry in the control room for the short period of time that it takes to isolate these circuits and back up the control room actions using alternate circuits from local control stations outside the control room. Walk through demonstrations have shown that the backup actions can be completed within time specified in the analysis following the initiation of the reactor trip. Section 3.5 provides

further information to provide reasonable assurance that the circuits within the control room will remain functional for the required period of time.

The controls to perform the actions are readily accessible at adjacent control board panels in the control room in an area where the operator can rapidly access.

In conclusion, the equipment to perform the actions remains functional and accessible during the fire for the short duration of time required until they are backed up at stations remote from the fire area to support the feasibility and reliability evaluation.

Criterion 5: Available Indications

The system or component needs to include diagnostic indications relevant to the desired operator manual actions. These indications include those necessary to detect and diagnose the location of the fire.

STPNOC Evaluation: A fire in the control room will be rapidly detected by the control room operators. Operator actions are performed rapidly in the control room prior to evacuation without further diagnosis. The actions are backed up from outside the control room within a short period of time (i.e., within 10 minutes except for tripping the RCPs). Sufficient indication is available outside the control room to demonstrate that the actions were successful in ensuring that the RCS process variables remain within those values predicted for a loss of normal a-c power, as required by 10 CFR 50, Appendix R, Section III.L.1.

In conclusion, diagnostic instrumentation remains available to support the feasibility and reliability evaluation.

Criterion 6: Communications

Equipment to support communications among personnel is required to ensure proper performance of operator manual actions. Communications equipment is needed to ensure that any activities requiring coordination are clearly understood and correctly accomplished.

STPNOC Evaluation: The operator manual actions will be performed using face-to-face communications in the control room. Therefore, communication capability remains available to support the conclusions of the feasibility and reliability evaluation.

Criterion 7: Portable Equipment

STPNOC Evaluation: The use of portable equipment is not required to perform the operator manual actions or to support the feasibility and reliability evaluation.

Criterion 8: Personnel Protection Equipment

STPNOC Evaluation: Personnel protection equipment is not required to perform the operator manual actions. The use of self-containing breathing apparatus is not expected to be required prior to evacuation of the control room. Therefore, the conclusions of the feasibility and reliability evaluation are supported.

Criterion 9: Procedures and Training

Written procedures should cover the operator manual actions that are required to be performed to achieve and maintain hot shutdown. The operator should receive training on these manual actions.

STPNOC Evaluation: Fires in control room leading to evacuation are addressed by procedure. The actions are already in the current plant procedure and familiar to the operators with the exception of the action to isolate feedwater. The plant procedure revision to address the revised additional action and re-arrangement of the order of performance of the other actions prior to control room evacuation will be implemented prior to implementation of this change. [Commitment #1 – Attachment 3] The plant operations staff will be trained on the use of this plant procedure through the licensed operator re-qualification program prior to implementation of this change. [Commitment #2 – Attachment 3] The operator manual actions are straightforward and familiar to the operators. Once the fire condition is diagnosed and control room evacuation is needed, the actions are performed in sequence without further diagnosis.

In conclusion, written procedures and training support the feasibility and reliability evaluation.

Criterion 10: Staffing

Adequate numbers of qualified personnel should be on site at all times so that hot shutdown conditions can be achieved and maintained in the event of a fire. Individuals needed to perform the operator manual actions should not have collateral duties, such as fire fighting or control room operation, during the evolution of the fire.

STPNOC Evaluation: The proposed actions are performed by a single operator assigned to the control room. The operator has no other responsibilities during the performance of these actions. Therefore, plant staffing remains adequate to support the feasibility and reliability analyses.

Criterion 11: Demonstrations

A demonstration with at least one randomly selected but established crew should be performed to provide a degree of overall assurance that the operator manual actions can be performed within the analyzed time available.

STPNOC Evaluation: Training and practice on the control room evacuation procedure is done at a frequency consistent with that established in existing training programs on abnormal procedures in compliance with 10 CFR 50.120. Demonstrations have been performed both in-plant and in the simulator by separate crews to validate that the actions can be performed consistent with the thermal-hydraulic analysis. This is adequate time to ensure that the (RCS) process variables remain within those values predicted for a loss of normal a-c power, as required by 10 CFR 50, Appendix R, Section III.L.1.

Overall Conclusion

The proposed operator actions are feasible and can be reliably performed to ensure that the (RCS) process variables remain within those values predicted for a loss of normal a-c power, as required by 10 CFR 50, Appendix R, Section III.L.1.

3.5 Circuit Functionality Assessment

3.5.1 Functionality Until Actions Are Backed Up Outside the Control Room

For any additional control room actions deemed necessary prior to evacuation, assurance would have to be provided that such actions could not be negated by subsequent spurious actuation signals from the postulated fire.

STP Licensing Basis

The STP licensed condition requires that cables and circuits for safe shutdown equipment be analyzed for the effects of hot shorts, open circuits or shorts to ground to ensure that they are adequately protected (Ref: FHAR, Page 4.1-11). The following specific guidelines apply for STP regarding the evaluation of the effects of spurious actuations (Ref: FHAR, Section 2.3.2):

- The worst case combination of a single spurious actuation and fire damage to circuits or other components in the fire area is evaluated.

- A spurious actuation may be caused by a single hot short, open circuit, short to ground, or wire to wire short.

- Spurious actuations of components due to damage to cables in the area of the fire are assumed to occur at any time following the onset of the fire.

- The simultaneous spurious actuation of all valves in each high-low pressure interface line was evaluated if the circuits for the valves were in the same fire area. Simultaneous failure of interface valves in all lines is not considered credible.

Therefore, except for valves in each high-low pressure interface line in the same fire area, the STP licensing basis only assumes one spurious actuation occurs due to a hot short during any fire scenario.

In a thermal-hydraulic analysis to demonstrate that the fire safe shutdown functional requirements are met, only the worst case spurious actuation needs to be considered. The thermal-hydraulic analysis for control room evacuation due to fire assumes that the worst case is considered until mitigated by the operator action (e.g., a pressurizer PORV spuriously opens and flow is diverted from the RCS until action is taken to shut the pressurizer PORV block valve).

NRC Response to Question 5.3.10 in GL 86–10 applies to Appendix R, Section III.L, "Alternative and Dedicated Shutdown Capability." The response stated that "the safe shutdown capability should not be adversely affected by a fire in any plant area which results in the loss of all automatic function (signals, logic) from the circuits located in the area in conjunction with one worst case spurious actuation or signal resulting from a fire." Therefore, the control room evacuation fire scenario need only assume the worst-case single spurious actuation which is consistent with the STP Licensing Basis. The STP analysis assumed two cases as discussed in Section 3.1. Each case assumed a worst case spurious actuation.

Consideration of Circuit Design

STP uses mostly thermo-set cables for control circuits between devices. Electric Power Research Institute (EPRI)/Nuclear Energy Institute (NEI) cable fire tests (Ref 6.3) provides information regarding the time for various circuit cable designs to fail due to fire and result in spurious actuations. Results from EPRI/NEI cable fire tests demonstrated that failure of thermo-set cables following fire initiation, in most cases, occurred at times greater than the time required to isolate the control room circuits by transfer operations performed from outside the control room.

Most circuits requiring actions prior to control room evacuation are transferred to circuits outside of the control room within 10 minutes. Walk-through demonstrations have shown that the backup action to trip the RCPs from outside the control room can be completed within 15 minutes. The RCPs are tripped prior to control room evacuation to prevent uncontrolled RCS de-pressurization due to spurious operation of the pressurizer spray valves. Multiple spurious actuations are required for this adverse effect to take place. This backup action is not required to support the licensing basis. A spurious start of RCP due to a fire-induced circuit failure, by itself, does not adversely impact RCS parameter and most likely improves removal of heat from the core.

Assessment

The STP licensing basis regarding spurious actuations is consistent with GL 86-10 for the Alternative and Dedicated Shutdown Capability used to respond to a control room evacuation because of fire. The STPNOC fire safe shutdown thermal-hydraulic analysis considered limiting

single spurious actuation cases, consistent with the licensing basis, and demonstrated that the fire protection requirements of Section III.L.1 of Appendix R to 10 CFR 50 are met.

As stated previously, the control room operations can be completed in a short period of time. The actions within the control room are backed up by actions outside the control room. The backup actions include transfer of control from the control room to the auxiliary shutdown panel and local control stations so that these circuits are independent of the control room. These backup actions have been demonstrated that they can be completed within relatively short period of time following the decision to trip the reactor and evacuate the control room. In addition, STP uses mostly thermo-set cables for control circuits between devices so that time to perform the backup actions outside the control room should be adequate to isolate a circuit before it would fail due to fire.

Although the performance of the additional actions in the control room are not currently credited in the fire hazards analysis as stand-alone actions, when coupled with actions outside the control room, it is unlikely that a spurious actuation would cause the RCS process variables to exceed those limits predicted for a loss of normal ac power. Therefore, it is reasonable to assume that the action performed in the control room will not be negated by subsequent spurious actuation signals from the postulated fire.

3.5.2 Automatic Turbine Trip Circuitry

When the reactor trip circuit breakers open in response to a manual reactor trip signal, an automatic turbine trip signal is generated by permissive P-16 relay. The P-16 relay generates a signal to reposition valves in the turbine electro-hydraulic control system to dump oil pressure and allow the turbine throttle and governor valves to rapidly close under spring pressure thus securing steam flow to the main turbine. Once oil is unloaded, the fire-induced circuit failure can not fail in a condition where oil would be re-directed to re-open the turbine throttle and governor valves. Based on the mechanics of this trip function, it is reasonable to assume turbine trip on a reactor trip for the design basis analysis.

3.6 Conclusion

Thermal-hydraulic analysis demonstrates that the proposed operations to be performed in the control room will ensure that the RCS process variables remain within those values predicted for a loss of normal a-c power, as required by 10 CFR 50, Appendix R, Section III.L.1. The operations are straightforward and familiar to the operators. The capability of performing such actions has been adequately demonstrated. Additionally, assurance exists that these actions should not be negated by subsequent spurious actuation signals from a postulated fire. The proposed operations in the control room will not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

4.0 Regulatory Evaluation

4.1 Applicable Regulatory Requirements/Criteria

Section III.L.1 of Appendix R to 10 CFR 50 states, in part, alternative or dedicated shutdown capability provided for a specific fire area shall be able to (a) achieve and maintain sub-critical reactivity conditions in the reactor; (b) maintain reactor coolant inventory; (c) achieve and maintain hot standby conditions: (d) achieve cold shutdown conditions within 72 hours; and (e) maintain cold shutdown conditions thereafter. During the post fire shutdown, the RCS process variables shall be maintained within those predicted for a loss of normal a-c power.

Section III.G.3 of Appendix R to 10 CFR 50 states, in part, alternative or dedicated shutdown capability and its associated circuits, independent of cables, systems or components in the area, room or zone under consideration, shall be provided where the protection of systems whose function is required for hot shutdown does not satisfy the circuit separation protection requirements of Section III.G.2.

Nuclear Regulatory Commission (NRC) Generic Letter (GL) 86-010, "Implementation of Fire Protection Requirements," provides guidance on acceptable methods of satisfying regulatory requirements. Section 3.8.4 of Enclosure 2 to GL 86-010 covers control room fire considerations. The only operator action in the control room prior to evacuation usually given credit for is the reactor trip. For any additional control room actions deemed necessary prior to evacuation, a demonstration of the capability of performing such actions would have to be provided. Additionally, assurance would have to be provided that such actions could not be negated by subsequent spurious actuation signals from the postulated fire.

Section 5.3.10 of Enclosure 2 to GL 86-010 states for alternative or dedicated shutdown systems that the safe shutdown capability should not be adversely affected by any one spurious actuation or signal resulting from a fire in any plant area. This Section also provides the usual assumptions that a plant transient analysis should consider in the design of the alternative and dedicated shutdown systems.

NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," provides published technical guidance to assist in determining that operator manual actions are feasible and can be performed reliably in response to fire. The NUREG report provides criteria for analyzing the feasibility and reliability of operator manual actions to achieve safe shutdown.

The STPNOC License Condition 2.E specifies, "STPNOC shall implement and maintain in effect all provisions of the approved fire protection program as described in the ... Fire Hazards Analysis Report." The STP Fire Hazards Analysis Report (FHAR) provides an analysis of how the safe shutdown strategy for each fire area meets regulatory requirements.

STP was licensed after January 1, 1979 and is not required to meet Appendix R. The approved STP FPP was reviewed by the NRC and is documented in the STP FHAR.

4.2 Precedent

The NRC approved the use of operator actions for tripping both units, closure of the main steam isolation valves, closure of the feedwater discharge valves and tripping of the feedwater turbine prior to evacuating the control room for the Susquehanna Plant. (Reference 6.4) The NRC concluded that since all actions, including the manual trip of the reactor, could be accomplished in rapid succession by a single operator at one location, this approach provided a suitable means of precluding potential spurious operations that could affect the shutdown capability, while satisfying the concern for limiting the number of actions within the control room prior to evacuation.

4.3 Significant Hazards Consideration

STPNOC has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

   Response: No.

   The design function of structures, systems and component are not impacted by the proposed change. The proposed change involves crediting operations in the control room prior to evacuation in the event of a fire in order to meet safe shutdown performance criteria. The proposed actions do not increase the probability of occurrence of a fire or any other accident previously evaluated.

   The proposed operations are feasible and reliable and demonstrate that the unit can be safely shutdown in the event of a fire. No significant consequences result from the performance of the proposed operations.

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

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

   Response: No.

   The design function of structures, systems and component are not impacted by the proposed amendment. The proposed change involves operations in response to a fire. They do not involve new failure mechanisms or malfunctions that can initiate a new accident.

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

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

   Response: No.

   The need to perform the proposed operations can be readily diagnosed and the operations can be performed in rapid succession by control room operators at their normal control station. The actions are straightforward and familiar to the operators. The actions have been verified that they can be performed through demonstration. The operations are backed up outside the control room such that assurance exists they should not be negated by subsequent spurious actuation signals from a postulated fire. The automatic turbine trip action can reasonably be assumed to occur with the credited manual reactor trip action that is part of the current licensing basis. The proposed actions are feasible and reliable and demonstrate that the unit can be safely shutdown in the event of a fire. The actions ensure that performance goals of Appendix R, Section III.L.2 are met. The achievement of these goals provide adequate margin from any safety limits.

   Therefore, the proposed change does not involve a significant reduction in a margin of safety.

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

4.4 Conclusion

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

5.0 Environmental Consideration

STPNOC has reviewed the proposed amendment and determined that it does not involve (1) a significant hazards consideration, (2) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (3) a significant increase in the individual or cumulative occupational exposure. Accordingly, the proposed changes meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10CFR51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 References

6.1 South Texas Project Electric Generating Station – NRC Integrated Inspection Report 05000498/2006002 and 05000499/2006002, dated May 18, 2006

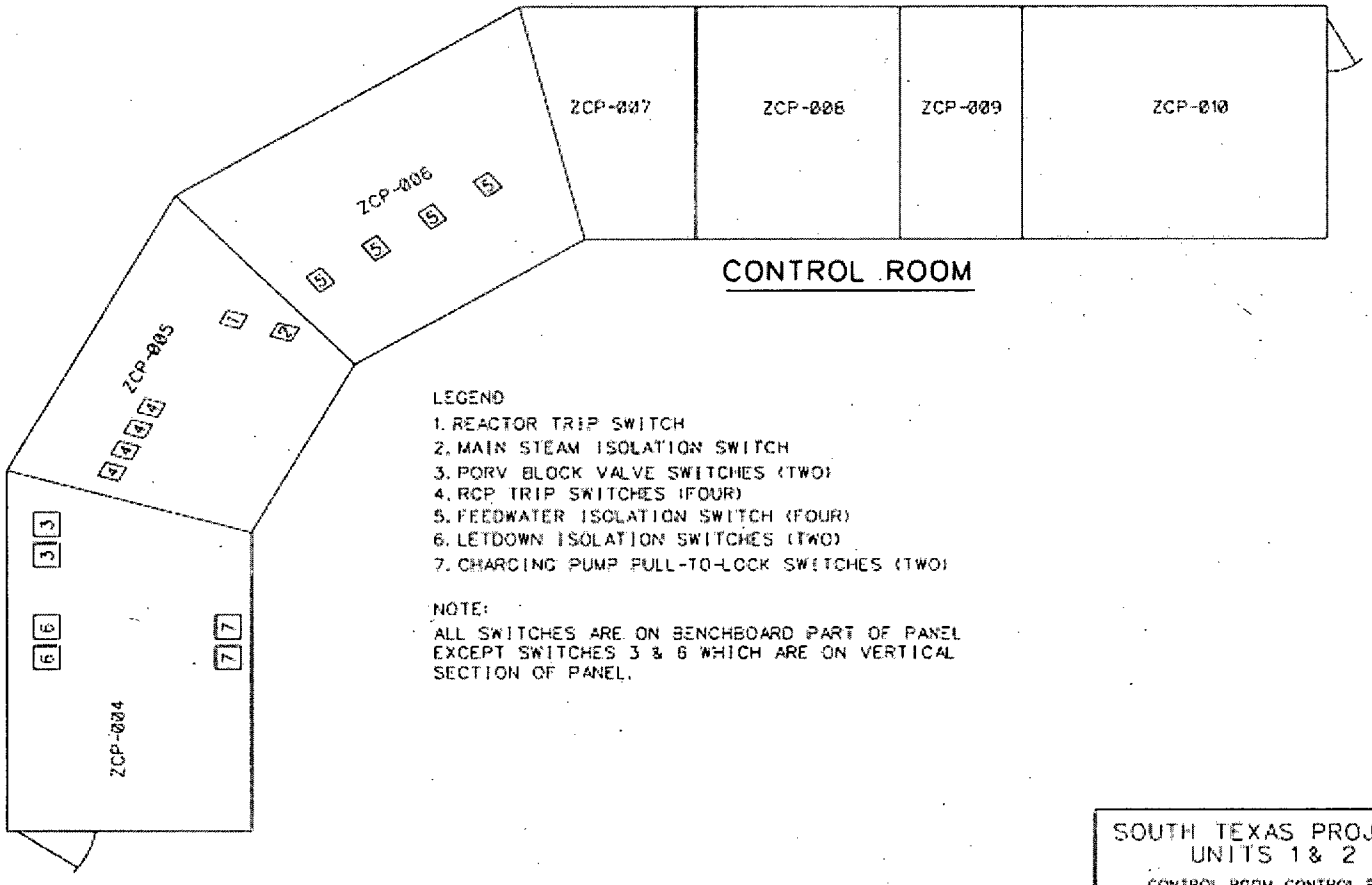
6.2 NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," USNRC, Final Report, October 2007

6.3 EPRI Report No. 1006961, ''Spurious Actuation of Electrical Circuits Due to Cable Fires: Results of an Expert Elicitation,'' dated May 2002 and NUREG/CR–6776, ''Cable Insulation Resistance Measurements Made During Cable Fire Tests,'' dated June 2002)

6.4 Letter from Chester Poslusny, NRC, to Robert G. Byram, Pennsylvania Power & Light Company, dated October 21, 1997, "Evaluation of Fire Protection Issues, Safe Shutdown Methodology and Analysis of Associated Circuits, Susquehanna Steam Electric Station (SSES), Units 1 and 2." (TAC Nos. M90600 and M90601)

Figure 1

Control Room Control Panel Switch Orientation



SOUTH TEXAS PROJECT
UNITS 1 & 2
CONTROL ROOM CONTROL PANEL SWITCH ORIENTATION
FIGURE 1 REVISION 0

Enclosure, Attachment 1

Credited control room operations time line and predicted plant thermal-hydraulic performance

Credited Control Room Operations Time Line

Time (seconds)	Control Room Operation
0	Manual Reactor Trip
2.5	Automatic Turbine Trip
30	Manual Isolation of Main Steam (single switch)
60	Close Pressurizer Block Valves (two switches)
120	Trip Reactor Coolant Pumps (four switches)
120	Manual Isolation of Feedwater (four switches)
120	Isolate Letdown (two switches)
120	Place Charging Pumps in PULL-TO-LOCK (two switches)

Predicted Plant Thermal-Hydraulic Performance for the Limiting Case (No Loss of Offsite Power)

1. Graph 1 – Predicted Reactor Coolant System (RCS) Temperature Transient

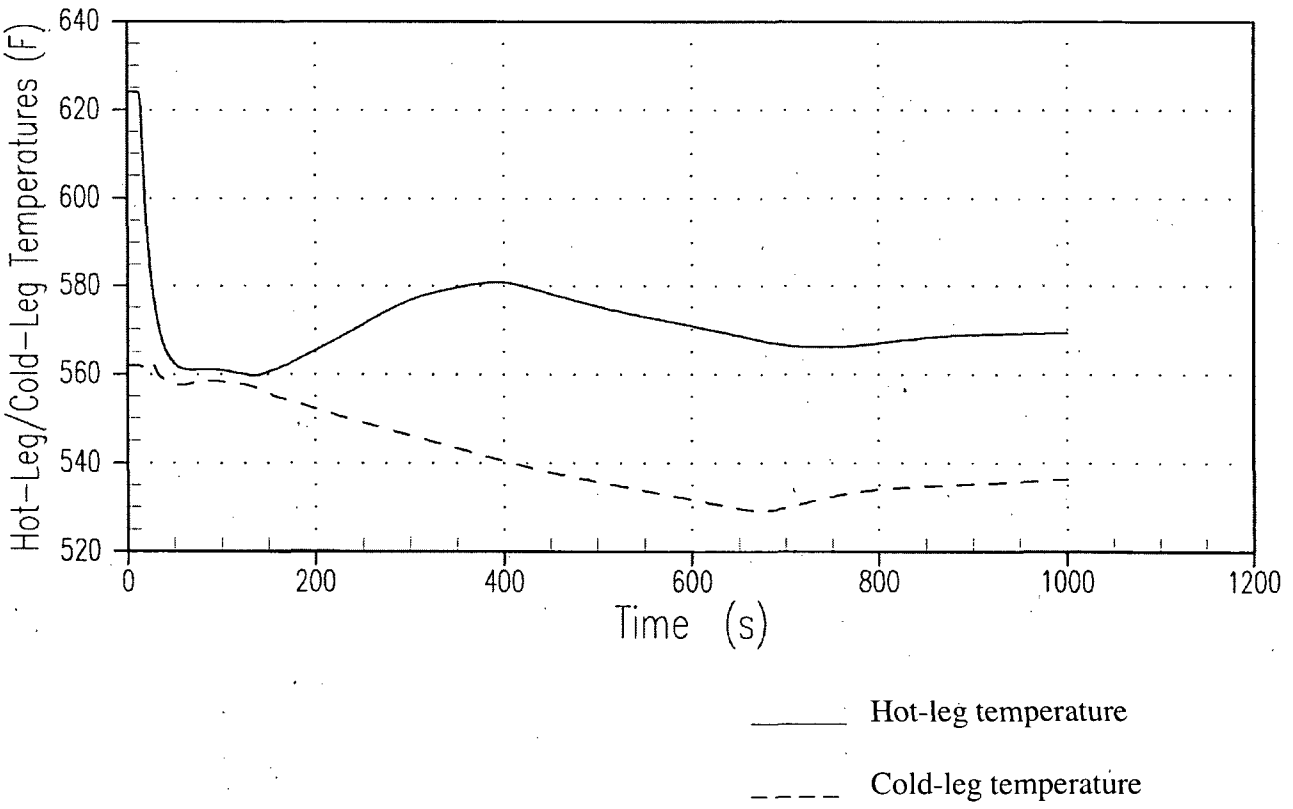
   RCS temperature stabilizes at no-load conditions and overcooling does not occur.

2. Graph 2 – Predicted RCS Pressure Transient

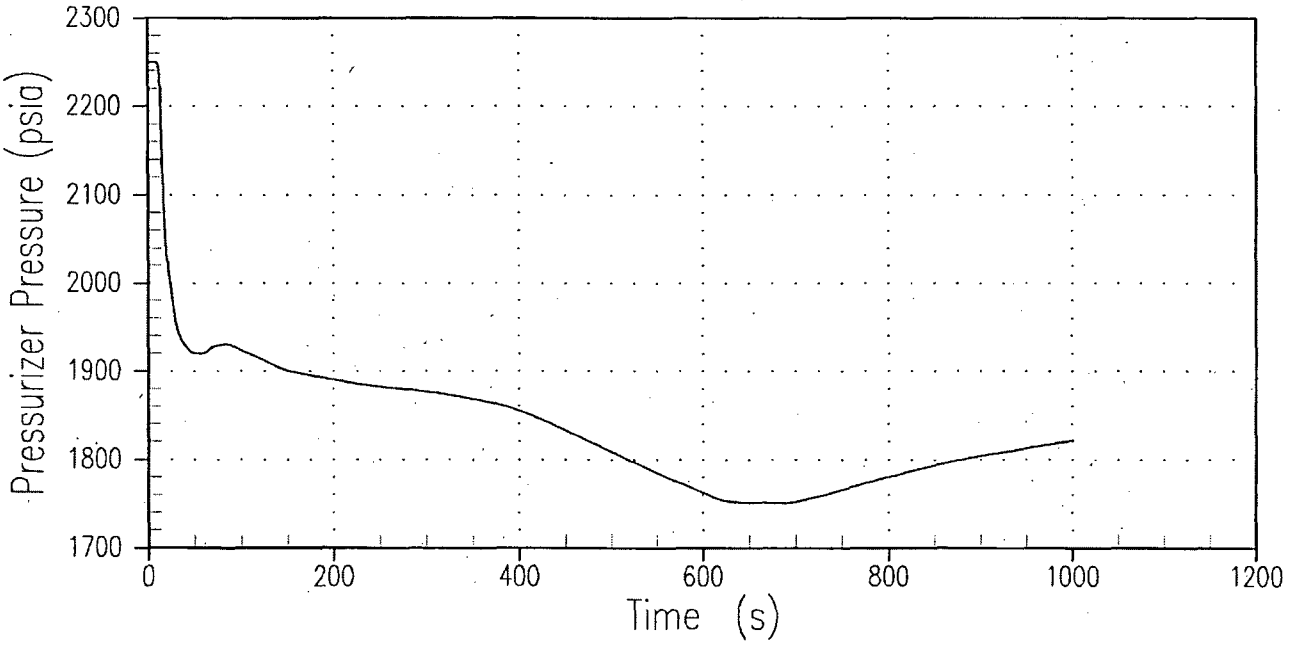
   Pressure stabilizes at approximately 1800 psig and over-pressurization or de-pressurization does not occur.

3. Graph 3 – Predicted Pressurizer Level Transient

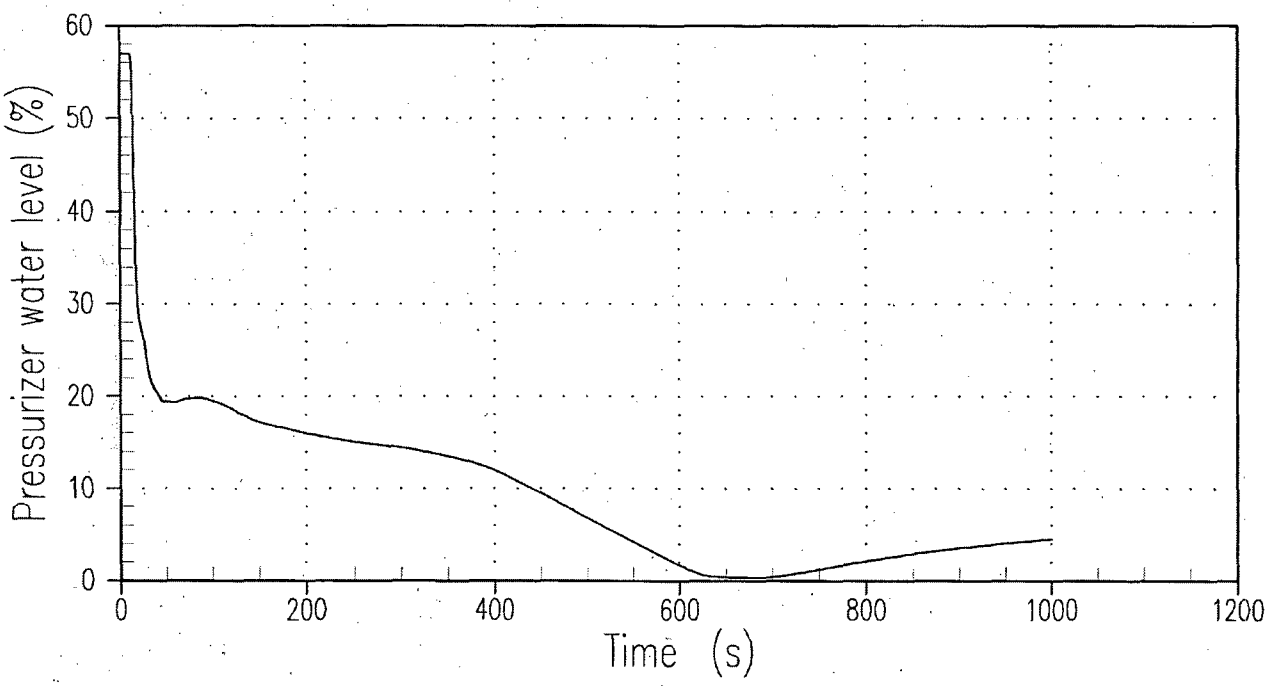
   Pressurizer level lowers to the bottom of the indicating range then returns during the plant transient



Graph 1 – Predicted Reactor Coolant System (RCS) Temperature Transient



Graph 2 – Predicted RCS Pressure Transient



Graph 3 – Predicted Pressurizer Level Transient

Enclosure, Attachment 3

List of Commitments

List of Commitments

The following table identifies those actions committed to by STPNOC in this document. Any statements in this document with the exception of those in the table below are provided for information purposes and are not considered commitments. Please direct questions regarding these commitments to Ken Taplett at (361) 972-8416.

Commitment	Continuing Compliance	Scheduled Completion Date
1. The plant procedure revision to address the actions discussed in this request will be implemented prior to implementation of this change to the Licensing Basis.	X	Prior to Implementation of Amendment
2. The plant operations staff will be trained on the use of the plant procedure to implement the proposed control room evacuation actions through the licensed operator re-qualification program prior to implementation of this change to the Licensing Basis.	X	Prior to Implementation of Amendment