10 CFR 50.90

PHILADELPHIA ELECTRIC COMPANY

NUCLEAR GROUP HEADQUARTERS

955-65 CHESTERBROOK BLVD.

WAYNE, PA 19087-5691

(215) 640-6000

STATION SUPPORT DEPARTMENT

August 27, 1993

Docket No. 50-353

License No. NPF-85

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington. DC 20555

SUBJECT: Limerick Generating Station, Unit 2
Technical Specifications Change Request

Gentlemen:

Philadelphia Electric Company is submitting Technical Specifications (TS) Change Request No. 93-14-2, in accordance with 10 CFR 50.90, requesting an amendment to the TS (i.e., Appendix A) of Operating License No. NPF-85 for Limerick Generating Station (LGS), Unit 2.

This submittal requests a one-time (i.e., temporary) TS change to extend the Allowed Outage Time (AOT) for the Unit 2 Residual Heat Removal Service Water (RHRSW) system as well as the Suppression Pool Spray and Suppression Pool Cooling modes of the Residual Heat Removal system from 72, 168 (i.e., seven days), and 72 hours, respectively, to 288 hours (i.e., twelve days). These extended AOTs will be needed on two (2) separate occasions during the fifth Unit 1 refueling outage currently scheduled to begin on January 29, 1994. These proposed extended AOTs will allow continued Unit 2 operation while maintenance isolation valves are installed on both loops of the RHRSW system. The RHRSW system is common to both Unit 1 and Unit 2. During this modification activity, operation of Unit 1 will continue to comply with the applicable Unit 1 TS AOTs. Approval of these TS changes is required in order to minimize the need for future one-time changes when maintenance or modifications on these effected portions of the RHRSW system are planned.

Information supporting this Change Request is contained in Attachment 1 to this letter. The LGS Unit 2 TS pages showing the proposed changes are contained in Attachment 2.

A001

We request that, if approved, the amendment to the LGS Unit 2 TS be effective by January 4, 1994.

If you have any questions, please do not hesitate to contact us.

Very truly yours,

G. A. Hunger, Jr.

G. A. Hunger, Jr., Director
Licensing Section

Attachments

cc: T. T. Martin, Administrator, Region I, USNRC w/attachments
N. S. Perry, USNRC Senior Resident Inspector, LGS w/attachments
W. P. Dornsife, Director, PA Bureau of Radiological Protection
w/attachments

COMMONWEALTH OF PENNSYLVANIA :

: ss.

COUNTY OF CHESTER :

G. R. Rainey, being first duly sworn, deposes and says:

That he is Vice President of Philadelphia Electric Company, the Applicant herein; that he has read the enclosed Technical Specifications Change Request No. 93-14-2 "One-Time Technical Specifications Change to Extend the Allowed Outage Time for the Residual Heat Removal Service Water System as well as the Suppression Pool Spray and Suppression Pool Cooling Modes of the Residual Heat Removal System," for Limerick Generating Station, Unit 2, Facility Operating License No. NPF-85, and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information and belief.

G. R. Rainey

Vice President

Subscribed and sworn to
before me this 16th day
of August 1993.

Erica A. Santon

Notary Public

Notarial Seal
Erica A. Santon, Notary Public
Tredyffrin Twp., Chester County
My Commission Expires July 10, 1995

ATTACHMENT 1

LIMERICK GENERATING STATION

UNIT 2

Docket No. 50-353

License No. NPF-85

TECHNICAL SPECIFICATIONS CHANGE REQUEST

No. 93-14-2

"One-Time Technical Specifications Change to
Extend the Allowed Outage Time for the
Residual Heat Removal Service Water System as well as the
Suppression Pool Spray and Suppression Pool Cooling Modes of the
Residual Heat Removal System - Unit 2"

Supporting Information for Changes - 13 pages

Philadelphia Electric Company (PECo), Licensee under Facility Operating License NPF-85 for the Limerick Generating Station (LGS), Unit 2, requests that the Technical Specifications (TS) contained in Appendix A to the Operating License be amended as proposed herein to allow for a one-time (i.e, temporary) extension of the Allowed Outage Times (AOTs) for the Residual Heat Removal Service Water (RHRSW) system as well as the Suppression Pool Spray (SPS) and the Suppression Pool Cooling (SPC) modes of the Residual Heat Removal (RHR) system from 72, 168 (i.e., seven days), and 72 hours, respectively, to 288 hours (i.e., twelve days). These extended AOTs will be needed on two (2) separate occasions during the fifth Unit 1 refueling outage. The fifth Unit 1 refueling outage is currently scheduled to begin on January 29, 1994. These proposed changes will allow continued Unit 2 operation during the installation of maintenance isolation valves upstream of the RHR heat exchanger inlet valves (i.e., valve nos. HV-51-1(2)F014A(B)) and downstream of the RHR heat exchanger outlet valves (i.e., valve nos. HV-51-1(2)F068A(B)) on both loops of the RHRSW system on both units. The proposed changes involve adding a one-time provision to TS Sections 3.6.2.2 - "Suppression Pool Spray," 3.6.2.3 - "Suppression Pool Cooling," and 3.7.1.1 - "Residual Heat Removal Service Water System, Common System." We propose that TS Section 3.6.2.2, Action a, TS Section 3.6.2.3, Action a, and TS Section 3.7.1.1, Action a.3. be changed such that two (2) separate 288-hour AOTs be authorized thereby allowing for continued operation of Unit 2 during the period that the 'A' RHRSW loop and the associated Unit 2 'A' RHR heat exchanger will be inoperable, and then during the a second period when the 'B' RHRSW loop and the associated Unit 2 'B' RHR heat exchanger will be inoperable.

These one-time TS changes are requested to avoid a required Unit 2 shutdown while the SPS mode of one subsystem of the RHR system is inoperable for more than 168 hours and the SPC mode of one subsystem of the RHR system and one subsystem of the RHRSW system are inoperable for more than 72 hours, in accordance with Unit 2 TS Sections 3.6.2.2, Action a, 3.6.2.3, Action a, and 3.7.1.1, Action a.3. The proposed changes to the Unit 2 TS are indicated by vertical bars in the margin of the TS pages 3/4 6-15, 3/4 6-16, and 3/4 7-1. The proposed TS changes are contained in Attachment 2.

During the modification activity described above, Unit 1 will be in a refueling outage and will continue to comply with the applicable TS AOTs. Therefore, no changes to the Unit 1 TS are required.

This TS Change Request for LGS Unit 2 provides a discussion and description of the proposed TS changes, a safety assessment of the proposed TS changes, information supporting a finding of No Significant Hazards Consideration, and information supporting an Environmental Assessment.

We request that, if approved, the amendment to the LGS Unit 2 TS be effective by January 4, 1994 in order to prepare for, and allow continued Unit 2 operation during the fifth Unit 1 refueling outage currently scheduled to begin on January 29, 1994.

Discussion and Description of the Proposed Changes

This proposed Technical Specifications (TS) Change Request involves a one-time (i.e., temporary) changes to the Limerick Generating Station (LGS), Unit 2 TS to extend the Allowed Outage Times (AOTs) for the RHRSW system as well as the Suppression Pool Spray (SPS) and the Suppression Pool Cooling (SPC) modes of the Residual Heat Removal (RHR) system from 72, 168 (i.e., seven days), and 72 hours, respectively, to 288 hours (i.e., twelve days). These extended AOTs will be needed on two (2) separate occasions during the fifth Unit 1 refueling outage, to allow continued Unit 2 operation during the installation of maintenance isolation valves upstream of RHR heat exchanger inlet valves (i.e., valve nos. HV-51-1(2)F014A(B)) and downstream of RHR heat exchanger outlet valve (i.e., valve nos. HV-51-1(2)F068A(B)) on both loops of the RHRSW system. The RHRSW system is common to both Unit 1 and Unit 2. This Change Request proposes that TS Section 3.7.1.1 be modified to allow one subsystem of RHRSW to be inoperable for 288 hours, and TS Section 3.6.2.2 and TS Section 3.6.2.3 be modified to allow the SPS and SPC modes of one RHR subsystem to be inoperable for 288 hours, during the fifth Unit 1 refueling outage.

These one-time TS changes are required to allow adequate time for modification of the 'A' and 'B' RHRSW loops (i.e., a common system) while avoiding a TS required Unit 2 shutdown. Furthermore, approval of these TS changes is required in order to install the maintenance isolation valves and thereby minimize the need for future one-time changes when maintenance or modifications on the effected portions of the Residual Heat Removal Service Water (RHRSW) system are planned. During this modification activity, Unit 1 will be in a refueling outage and will continue to comply with the applicable Unit 1 TS AOTs for RHRSW as well as the SPS and SPC mode of RHR.

The modification to be performed is the addition of eight (8) manually operated maintenance isolation valves, four (4) per unit, and associated vents and drains to facilitate RHRSW system draining. These valves will be located upstream of each unit's two (2) RHR heat exchangers and associated RHRSW inlet valves, and downstream of each unit's two (2) RHR heat exchangers and associated RHRSW outlet valves. The installed valves will be used to isolate the heat exchangers from the RHRSW system during future maintenance activities. Currently, there is no isolation capability that allows servicing of the existing components without the use of multiple freeze seals.

The RHRSW system consists of two (2) independent loops, each providing coolant to the tube side (i.e., RHRSW system flow) of one heat exchanger on each unit. The loops will be removed from service in series, hence the need for two (2) extended AOT periods during the fifth Unit 1 refueling outage. These RHRSW loops are unisolable and the piping configurations require the use of multiple freeze seals and partial system draining to perform valve installation. The proposed location and physical constraints surrounding the installation of the new valves necessitates freezing portions of the RHRSW system that are common to both units. Therefore, one RHR heat exchanger on both units will be inoperable during the proposed 288 hour duration. The time required to establish multiple freeze seals, partial draining, valve installation, and subsequent system restoration is estimated at between ten (10) and twelve (12) days and therefore, exceeds the time allowed by the applicable TS AOTs for Unit 2. Accordingly, these one-time Unit 2 TS changes are needed in order to prevent an unnecessary shutdown of Unit 2.

Safety Assessment

This proposed Technical Specifications (TS) Change Request involves a one-time (i.e., temporary) change to the Limerick Generating Station (LGS), Unit 2 TS to extend the Allowed Outage Times (AOTs) for the Residual Heat Removal Service Water (RHRSW) system as well as the Suppression Pool Spray (SPS) and the Suppression Pool Cooling (SPC) modes of the Residual Heat Removal (RHR) system from 72, 168 (i.e., seven days), and 72 hours, respectively, to 288 hours (i.e., twelve days). These extended TS AOTs will be needed on two (2) separate occasions during the fifth Unit 1 refueling outage to allow continued Unit 2 operation during the installation of maintenance isolation valves on the RHRSW loops. During this modification activity, Unit 1 will be in a refueling outage and will continue to comply with the applicable Unit 1 TS AOTs for RHRSW as well as the SPS and SPC modes of RHR. When the 'A' loop of RHRSW is removed from service for the installation of the four (4) maintenance isolation valves (i.e., two (2) for Unit 1, and two (2) for Unit 2), the Unit 1 'A' RHR heat exchanger and the Unit 2 'A' RHR heat exchanger will be declared inoperable. In addition, the Unit 1 'A' RHR heat exchanger, shell side (i.e., RHR system flow), and the Unit 2 'A' RHR heat exchanger, shell side, will be isolated from the corresponding RHR loop to eliminate the possibility of water contaminated with radioactive material from leaking into the RHRSW system. Removal of the 'A' RHRSW loop, the Unit 1 'A' RHR heat exchanger, and the Unit 2 'A' RHR heat exchanger from service will not prevent any loop of RHR on either unit from injecting water into the reactor vessel in the Low Pressure Coolant Injection (LPCI) mode of operation.

When the 'B' loop of RHRSW is removed from service for the installation of the four (4) maintenance isolation valves (i.e., two (2) for Unit 1, and two (2) for Unit 2), the Unit 1 'B' RHR heat exchanger and the Unit 2 'B' RHR heat exchanger will be declared inoperable. In addition, the Unit 1 'B' RHR heat exchanger, shell side, and the Unit 2 'B' RHR heat exchanger, shell side, will be isolated from the corresponding RHR loop to eliminate the possibility of water contaminated with radioactive material from leaking into the RHRSW system. Removal of the 'B' RHRSW loop, the Unit 1 'B' RHR heat exchanger, and the Unit 2 'B' RHR heat exchanger from service will not prevent any loop of RHR on either unit from injecting water into the reactor vessel in the LPCI mode of operation.

The accidents potentially impacted by these proposed TS changes are the full range of Loss of Coolant Accidents (LOCAs) with and without a concurrent Loss of Off-site Power (LOOP). The loss of shutdown cooling was also considered. However, any postulated accident that could occur during the time that the proposed extended AOTs are being exercised on Unit 2 is bounded by previous analyses. The removal of the 'A' RHRSW loop from service will affect the operability of the Unit 1 and Unit 2 'A' RHR heat exchangers (i.e., equipment numbers 1AE205 and 2AE205). The removal of the 'B' RHRSW loop from service will affect the operability of the Unit 1 and Unit 2 'B' RHR heat exchangers (i.e., equipment numbers 1BE205 and 2BE205). The RHR heat exchangers provide a method of decay heat removal and primary containment suppression pool/drywell temperature and pressure control. Decay heat removal is a routine shutdown cooling mode of operation when the unit is shutdown. Two (2) loops of shutdown cooling are required to be operable in accordance with TS Sections 3.4.9.1 (i.e., while the reactor is in Operational Condition (OPCON) 3 - hot shutdown), 3.4.9.2 (i.e.,OPCON 4 - cold shutdown), and 3.9.11.2 (i.e., OPCON 5 - refueling), or an alternate method of decay heat removal is required to be demonstrated. Unit 2 will be in OPCON 1 (i.e., power operation), therefore these TS Sections are not applicable. However, if Unit 2 is required to be shutdown during the period the 'A' or 'B' RHRSW loop is inoperable,

alternate decay heat removal methods are available such as establishing a shutdown cooling path through the Automatic Depressurization System (ADS) valves as discussed in the Updated Final Safety Analysis Report (UFSAR) sections 5.4.7 and 15.2.9, or using the main turbine condenser as a heat sink if off-site power is available. These methods will satisfy the shutdown cooling requirements while the reactor is in OPCONs 3 and 4. In OPCON 5, alternate decay heat removal methods such as the Reactor Water Cleanup (RWCU) system can be utilized to satisfy the shutdown cooling requirements after a sufficient time after plant shutdown.

Suppression pool/drywell temperature and pressure control is an accident mitigation function of the RHR system. The RHR system accomplishes this function by two (2) modes of operation, SPS and SPC, both of which utilize the RHR heat exchanger. TS Section 3.6.2.2 requires that two (2) loops of the SPS mode of the RHR system be operable in OPCONs 1, 2, and 3. The TS AOT for one loop of the SPS mode is 168 hours. This Change Request proposes that this AOT for Unit 2 be extended to 288 hours during the fifth Unit 1 refueling outage. TS Section 3.6.2.3 requires that two (2) loops of the SPC mode of the RHR system be operable in OPCONs 1, 2, and 3. The TS AOT for one loop of the SPC mode being inoperable is 72 hours. This Change Request proposes that this AOT for Unit 2 be extended to 288 hours during the fifth Unit 1 refueling outage.

The LGS UFSAR, Section 6.2, states that one operable RHR heat exchanger is adequate for accident mitigation. Two cases of one operable RHR heat exchanger during a postulated accident are presented in the UFSAR. In the first case, the operable RHR heat exchanger is placed in service in the RHR drywell spray and suppression pool spray mode while one RHR pump in LPCI mode of operation and one Core Spray loop inject water into the reactor vessel. In the other case, the operable RHR heat exchanger is placed in service along with an associated RHR pump taking suction from the suppression pool and discharging to the reactor vessel. The flow from the RHR pump is cooled by RHRSW flow via the RHR heat exchanger before being discharged into the reactor vessel while another RHR pump, in LPCI mode of operation, and one Core Spray loop inject directly into the reactor vessel. Both cases assume a LOOP and that the High Pressure Coolant Injection (HPCI) system is available for the entire accident. Other assumptions include; initial suppression pool temperature and RHRSW temperature are at their maximum values; all the decay heat from the reactor vessel is rejected through the one operable RHR heat exchanger; and the RHR heat exchanger is in a fully fouled condition. The peak containment pressure is higher for the second case, but is still much less than the containment design pressure. This analysis is for a rupture of a reactor recirculation line and is the bounding event for similar occurrences.

TS Section 3.7.1.1 requires that two (2) loops of RHRSW be operable in OPCONs 1, 2, and 3. The AOT for one loop of RHRSW being inoperable, which renders the associated RHR heat exchanger inoperable, is 72 hours. This Change Request proposes that this AOT be extended to 288 hours during the fifth Unit 1 refueling outage. The RHRSW system was designed with sufficient capacity so that one loop of RHRSW with two (2) RHRSW pumps in operation and two (2) spray pond spray networks can mitigate a Design Basis Accident (DBA) on one unit and allow the safe shutdown of the other unit as described in the UFSAR Section 9.2.3.

Unit 1 will be in a refueling outage with cold shutdown conditions established. The 'A' or 'B' loop of RHRSW will not be removed from service in order to install the maintenance isolation valves until the Unit 1 decay heat generation is reduced from 125 MWt at the time of shutdown, to a level that will allow the removal of one RHR heat exchanger from service. During the time that one loop of RHRSW is removed from service, the remaining RHRSW loop may be in operation to support Unit 1 shutdown cooling requirements. However, the Unit 1 heat removal requirements on the operable RHRSW loop needed to maintain cold shutdown conditions will be minimal, due to prior establishment of cold shutdown conditions, the reduction in decay heat generation, and the ability to place the Spent Fuel Pool Cooling and Fuel Pool Cleanup system, along with a recirculation pump or a RHR pump for reactor core circulation, in service as an alternate decay heat removal method. Furthermore, draining of the Unit 1 reactor cavity will not be allowed until both loops of RHRSW are returned to service or an alternate decay heat removal method is available. Since one loop of RHRSW can mitigate a DBA on one unit and support the safe shutdown of the other unit, the potential heat removal requirements with respect to Unit 2 during the period that these proposed TS changes will be in effect will be ensured to be within the capacity of one RHRSW loop.

During the second Unit 2 refueling outage the Unit 2 'A' and 'B' RHR heat exchangers were tested and data was obtained. The Unit 2 'A' RHR heat exchanger's actual heat removal capacity was evaluated to be 215 x 10^6 BTU/HR. This is 76% above the minimum design capacity of 122 x 10^6 BTU/HR. Likewise, the Unit 2 'B' RHR heat exchanger's actual heat removal capacity was evaluated to be 203 x 10^6 BTU/HR. This is 66% above the minimum design capacity of 122 x 10^6 BTU/HR.

The above discussions do not account for a single failure that could render the operable RHR heat exchanger or operable RHRSW loop inoperable during the proposed extended AOT. By limiting the time an RHRSW loop is out of service and maintaining one of the Unit 2 RHR heat exchangers, and the associated RHRSW loop and associated equipment/system operable during these periods, the consequences of an accident previously evaluated will remain unchanged. The components that have the potential of preventing a Unit 2 RHR heat exchanger or a loop of RHRSW from performing their safety function if they were to fail during the time that one loop of the RHRSW system is rendered inoperable, for the purpose of installing the maintenance isolation valves, are listed below.

'A' RHRSW Loop Inoperable

- RHR heat exchanger, shell side, outlet valve:
  HV-51-2F003B (normally open - safety function open).

- RHR heat exchanger, RHRSW inlet valve:
  HV-51-2F014B (normally closed - safety function open).

- RHR heat exchanger, shell side, bypass valve:
  HV-C-51-2F048B (normally open - safety function throttled/closed).

- RHR heat exchanger, RHRSW outlet valve:
  HV-51-2F068B (normally closed - safety function throttled/open).

- RHRSW spray pond spray nozzle, inlet valve:
  HV-12-032B (normally closed - safety function open).

- RHRSW spray pond spray nozzle, inlet valve:
  HV-12-032D (normally closed - safety function open).

'B' RHRSW Loop Inoperable

- RHR heat exchanger, shell side, outlet valve:
  HV-51-2F003A (normally open - safety function open).

- RHR heat exchanger, RHRSW inlet valve:
  HV-51-2F014A (normally closed - safety function open).

- RHR heat exchanger, shell side, bypass valve:
  HV-C-51-2F048A (normally open - safety function throttled/closed).

- RHR heat exchanger, RHRSW outlet valve:
  HV-51-2F068A (normally closed - safety function throttled/open)

- RHRSW spray pond spray nozzle, inlet valve:
  HV-12-032A (normally closed - safety function open).

- RHRSW spray pond spray nozzle, inlet valve:
  HV-12-032C (normally closed - safety function open).

A review of the maintenance records was performed to identify any occurrences of the above identified valves failing to align to their safety function position. The following occurrences and corrective actions were noted.

HV-51-1F014A - Occurrence: Valve would not open on demand.

Corrective Action: Valve internals were replaced during the fourth Unit 1 refueling outage and the valve is currently operating properly.

HV-51-1F068A - Occurrence: Valve will not stroke properly.

Corrective Action: Valve was repaired/rebuilt with stainless steel internals during the fourth Unit 1 refueling outage and is currently operating properly.

HV-51-1F014B - Occurrence: Valve would not stroke open.

Corrective Action: Valve was disassembled and reworked during the fourth Unit 1 refueling outage and is currently operating properly.

HV-51-1F068B - Occurrence: RHRSW flow does not change when the valve is stroked.

Corrective Actions: The valve internals were upgraded to stainless steel during the second Unit 2 refueling outage and the valve is currently operating correctly.

No other occurrences of the other identified valves failing to function properly were noted. Therefore, the probability of a malfunction of any of these valves preventing the RHR heat exchanger or RHRSW loop from performing their safety function is considered to be minimal.

The above identified valves are powered from Class 1E safeguard buses. To ensure electrical power is available during a LOOP, the following Emergency Diesel Generators (EDGs) must remain operable during the exercise of proposed extended Unit 2 TS AOTs.

'A' RHRSW Loop Inoperable

HV-51-2F014B and HV-C-51-2F048B are powered from Unit 2 Division 2 power supplies. HV-51-2F068B and HV-12-032D are powered from Unit 2 Division 4 power supplies. HV-12-032B is powered from Unit 1 Division 2 power supplies. Accordingly, the D12, D22, and D24 EDGs will be required to be operable while the 'A' loop of RHRSW is inoperable for installation of the maintenance isolation valves.

'B' RHRSW Loop Inoperable

HV-51-2F014A and HV-C-51-2F048A are powered from Unit 2 Division 1 power supplies. HV-51-2F068A and HV-12-032C are powered from Unit 2 Division 3 power supplies. HV-12-032A is powered from Unit 1 Division 1 power supplies. Accordingly, the D11, D21, and D23 EDGs will be required to be operable while the 'B' loop of RHRSW is inoperable for the installation of the maintenance isolation valves.

The removal of the 'A' or 'B' RHRSW loop from service will not affect the capability of any Emergency Core Cooling Systems (ECCS) from injecting water into the reactor vessel. The RHRSW system is manually operated and is not required during the first ten minutes of an accident as described in UFSAR Section 6.2.2.3. Therefore, the short-term (i.e., less than ten minutes) emergency core cooling capability of Unit 2 ECCS is unaffected. Long-term actions (i.e., greater than ten minutes) will be affected to the extent that only one RHR heat exchanger will be operable for long-term heat removal. Long-term cooling requirements will be

met by the operable Unit 2 RHR heat exchanger and the associated operable RHRSW loop with the RHR system in either the SPS or the SPC mode of operation, as discussed earlier. Removal of additional Unit 2 equipment and/or systems during the exercise of the proposed extended TS AOTs will be allowed in accordance with existing TS requirements as long as the removal of equipment and/or systems from service does not adversely affect the operability of the operable RHRSW loop as well as the operable SPS and SPC modes of RHR operation, or places Unit 2 outside of the analysis described in UFSAR Section 6.2.

The Emergency Service Water (ESW) system will be affected by removing either of the two (2) RHRSW loops from service. The return flow from the ESW system joins the RHRSW system, and shares one return flow path for each ESW loop to the Spray Pond. When the 'A' ESW loop is inoperable, both ESW loops will be aligned to return to the 'B' RHRSW loop, and when the 'B' RHRSW loop is inoperable, both ESW loops will be aligned to return to the 'A' RHRSW loop. These alignments are within the design capabilities of the ESW system and will be controlled by approved procedures. A computer analysis of the flow distribution to components cooled by ESW was performed. This analysis indicates that sufficient ESW flow is available to support operability of essential components for this configuration. Measurements of ESW system flow will be performed on the most limiting components as determined by the computer analysis to validate component and/or system operability. Physical work on either the 'A' or the 'B' RHRSW loop will not begin until the ESW system (i.e., both loops) are verified operable under the conditions described above.

The Unit 1 and Unit 2 Turbine Enclosure Cooling Water (TECW) system will also be affected such that the ESW system will not be available to backup the Service Water system as its cooling medium. The ESW system is utilized as the cooling medium for the TECW system in the event of a LOOP. The ESW return path from the Unit 1 TECW heat exchanger to the 'A' RHRSW loop will be isolated during the 'A' RHRSW loop modification installation period preventing the ESW system from being capable of removing heat from the Unit 1 TECW system. TECW is a non-safety related system and is normally aligned to the Service Water system. Since Unit 1 will be in a refueling outage, loss of the ESW system's ability to remove heat from the Unit 1 TECW system will have no adverse impact. The ESW return path from the operating Unit 2 TECW heat exchanger to the 'B' loop of RHRSW will be isolated during the 'B' RHRSW loop modification installation period preventing the ESW system from being capable of backing up the Service Water system. The inoperability of the 'B' RHRSW loop does not pose a problem under normal operating conditions since the Service Water system is utilized as the normal cooling medium for the Unit 2 TECW system. The TECW system is needed to maintain operation of Unit 2; however, should Service Water become unavailable to cool the TECW heat exchanger during the period when the 'B' RHRSW loop is inoperable, Unit 2 may be shutdown. TECW is not required to be operable in order to shutdown the unit or mitigate the consequences of an accident. Therefore, the ability to safely shutdown Unit 2 is not compromised by the installation of this modification during the fifth Unit 1 refueling outage.

The concern associated with the proposed TS changes is the reduced margin of safety incurred by extending the applicable AOTs. The RHRSW system is designed such that the AOT for operation with less than three (3) RHRSW pumps operable along with their associated operable EDGs is limited to 72 hours to ensure adequate decay heat removal capability is available for the design basis scenario of a LOCA/LOOP on one unit and simultaneous safe shutdown of the other unit. The reduction in the margin of safety due to increasing the applicable AOTs from 72

hours and 168 hours to 288 hours is considered minimal as discussed below, since this reduction only reflects the small increase in the probability that a LOCA/LOOP event would occur on Unit 2 during the exercise of the proposed 288 hour AOT period as compared to the probability of a LOCA/LOOP on Unit 2 during the 72 hour AOT currently allowed by TS. In addition, as a compensatory measure a roving fire watch will be established for those areas that solely rely on the inoperable loop of the RHRSW system during the proposed extended AOT. Therefore, as a result of this compensatory measure, the proposed extended AOT does not adversely affect the level of protection against the effects of a fire.

A Probabilistic Risk Assessment (PRA) was performed for the conditions discussed above. The Core Damage Frequency (CDF) increase from the baseline CDF risk is approximately 5% when extending the AOT for TS Section 3.6.2.2, Action a, TS Section 3.6.2.3, Action a, and TS Section 3.7.1.1, Action a.3 to 288 hours. This increased in the Unit 2 CDF is judged to be minimal. In addition, the cumulative risk of the two (2) periods when the extended 288 hour AOTs will be exercised is judged to be minimal. The CDF associated with the proposed extended AOTs is equivalent to the CDF if the HPCI system were to be removed from service for 168 hours (i.e., seven days) during power operation. The existing LGS TS AOT for an inoperable HPCI system is 336 hours (i.e., fourteen days).

Information Supporting a Finding of No Significant Hazards Consideration

We have concluded that the proposed changes to the Limerick Generating Station (LGS), Unit 2 Technical Specifications (TS) to extend the Allowed Outage Times (AOTs) for the Residual Heat Removal Service Water (RHRSW) system as well as the Suppression Pool Spray (SPS) and the Suppression Pool Cooling (SPC) modes of the Residual Heat Removal (RHR) system from 72, 168 (i.e., seven days), and 72 hours, respectively, to 288 hours (i.e., twelve days) on two (2) separate occasions during the fifth Unit 1 refueling outage, do not constitute a significant hazards consideration. In support of this determination, an evaluation of each of the three (3) standards set forth in 10 CFR 50.92 is provided below.

1) The proposed Technical Specifications (TS) changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed one-time Unit 2 TS changes do not increase the consequences of an accident from any previously evaluated. Extending the Allowed Outage Times (AOTs) for the either loop of Residual Heat Removal Service Water (RHRSW) system from 72 hours and the Suppression Pool Spray (SPS) and Suppression Pool Cooling (SPC) modes of the Residual Heat Removal (RHR) system from 168 and 72 hours, respectively, to 288 hours on two (2) separate occasions during the fifth Unit 1 refueling outage, does not cause an increase in the probability of an accident since the affected systems are not accident initiators as defined by the Updated Final Safety Analysis Report (UFSAR). Maintaining one loop of RHRSW as well as a loop of the SPC mode of the RHR system operable during the period the other loop of RHRSW is removed from service, will ensure that the consequences of the accidents previously evaluated will remain bounded by the UFSAR Safety Analysis. Therefore, there is no increase in the consequences of an accident. This conclusion is based on the following considerations.

a. Removal of the 'A' or 'B' RHRSW loop and its associated Unit 1 and Unit 2 RHR heat exchanger will not prevent any Emergency Core Cooling System (i.e., Low Pressure Coolant Injection (LPCI), Core Spray (CS), and High Pressure Coolant Injection (HPCI)) from injecting water into the reactor vessel. Short-term mitigation of an accident is unaffected since RHRSW is manually operated and is not required to be placed in service during the first 10 minutes of an accident.

b. For long-term accident response (i.e., greater than 10 minutes), accident analyses discussed in UFSAR Section 6.2 indicates that one loop of RHRSW and one associated RHR heat exchanger are capable of removing the decay heat from both units assuming a concurrent Loss Of Off-site Power (LOOP)/Loss of Coolant Accident (LOCA) on one unit and safe shutdown on the other unit.

c. Unit 1 will be in a refueling outage. The heat load on the remaining RHRSW loop from Unit 1 will be minimal based on long time after shutdown when either the 'A' or 'B' loop of RHRSW will be removed from service, and the availability of alternate decay heat removal methods that do not reject heat to RHRSW.

d. The RHRSW and Emergency Service Water (ESW) systems are designed with sufficient capacity such that one loop of RHRSW (i.e., two (2) pumps in operation) and one loop of ESW (i.e., one pump in operation) using one spray pond return header and two (2) spray networks is the minimal alignment required to mitigate a LOCA with a concurrent LOOP on one unit and a safe shutdown on the other unit.

By design, the unit undergoing an accident would receive 100% of the required RHRSW flow to its RHR heat exchanger and the unit undergoing a normal shutdown would receive 67% to 100% of the required RHRSW flow to its RHR heat exchanger. Sixty-seven percent RHRSW flow to the unit undergoing a normal shutdown is sufficient to remove the heat load transferred through the RHR heat exchanger as discussed in UFSAR Section 9.2.3. However, since Unit 1 will already be in cold shutdown, the heat removal requirements and therefore the required RHRSW flow will be substantially less than 67%.

The probability for a single failure to occur and render the operable RHR heat exchanger or operable RHRSW loop inoperable during the proposed extended AOTs, has been evaluated and the conclusion is that there is no increase in the existing probability for a single failure as a result of these proposed TS changes.

Therefore, implementation of the proposed 288 hour AOTs will not result in an increase in the probability or consequences of an accident previously evaluated.

2) <u>The proposed TS changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.</u>

Since the proposed TS changes will not result in any new plant configuration, new system alignment, or normal operational procedures, the possibility of a new or different kind of accident is not created. The systems affected are not accident initiators. The plant has been analyzed for one RHRSW loop out of service. Plant operation and accident mitigation

utilizing one loop of RHRSW and one RHR heat exchanger is described in UFSAR Sections 5.4, 6.2, and 15.2. The operable systems that will be affected during the implementation of these proposed one-time TS changes will be operated within their design capabilities under approved procedures. The removal of one RHRSW loop and its associated RHR heat exchanger from service is currently allowed by TS. These proposed one-time TS changes will only extend the Unit 2 subsystem AOTs for the RHRSW system as well as the SPS and SPC modes of operation of the RHR system from 72, 168, and 72 hours respectively, to 288 hours on two (2) separate occasions during the fifth Unit 1 refueling outage.

The proposed changes will not cause the components important to safety that have been discussed above to be challenged by a different type of malfunction, since no new type of malfunction will be created by any operation associated with this activity.

Therefore, these proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3) <u>The proposed TS changes do not involve a significant reduction in a margin of safety.</u>

The RHRSW system and the RHR system are designed with sufficient redundancy such that the removal from service of a component and/or subsystem will not prevent the system from performing its required safety function. Since removal of either the 'A' or 'B' RHRSW loop from service with Unit 2 in operation and Unit 1 in a refueling outage is allowed by existing TS, the concern is the reduced margin of safety incurred by extending the applicable AOTs.

The RHRSW system is designed such that the AOT for operation with less than three (3) RHRSW pumps operable along with their associated operable Emergency Diesel Generators (EDGs) is limited to 72 hours to ensure adequate decay heat removal capability is available for the design basis accident scenario of a LOCA/LOOP on one unit and simultaneous safe shutdown of the other unit. The reduction in the margin of safety due to increasing the applicable AOTs from 72 and 168 hours to 288 hours is considered minimal as discussed below, since this reduction only reflects the small increase in the probability that a LOCA/LOOP event would occur on Unit 2 within the proposed 288 hour AOT period as compared to the probability of a LOCA/LOOP on Unit 2 during the 72 hour AOT currently allowed by TS. In addition, as a compensatory measure a roving fire watch will be established for those areas that solely rely on the inoperable loop of the RHRSW system during the proposed extended AOT. Therefore, as a result of this compensatory measure, the proposed extended AOT does not adversely affect the level of protection against the effects of a fire.

A Probabilistic Risk Assessment (PRA) was performed for a RHRSW loop being out of service for 288 hours on an operating unit. The Core Damage Frequency (CDF) increase from the baseline CDF risk is approximately 5% when extending the AOT for TS Section 3.6.2.2, Action a, TS Section 3.6.2.3, Action a, and TS Section 3.7.1.1, Action a.3 to 288 hours. This increase in the Unit 2 CDF is judged to be minimal. In addition, the cumulative risk of the two (2) periods when the extended 288 hour AOTs will be exercised is judged to be minimal. The CDF associated with the proposed extended AOTs is

equivalent to the CDF if the HPCI system were to be removed from service for 168 hours (i.e., seven days) during power operation. The existing TS AOT for an inoperable HPCI system is 336 hours (i.e., fourteen days).

In addition, the following equipment and/or systems will be required to be operable for the duration of the proposed extended AOTs, or the Actions of TS Sections 3.6.2.2.b, 3.6.2.3.b, and 3.7.1.1.a.4 must be followed.

'A' RHRSW Loop Inoperable

- Unit 2 'B' RHR heat exchanger and associated equipment.
- 'B' RHRSW loop and associated equipment.
- HPCI (Unit 2).
- D12, D22, and D24 EDGs and associated equipment.
- D11 and D23 EDGs and associated equipment to ensure adequate ESW and RHRSW flow. These EDGs are needed since flow verification assumed two (2) operable RHRSW pumps on a loop and all four (4) ESW pumps are operable.
- Any other system and/or equipment that, if removed, would place Unit 2 outside the bounds of the analysis described in UFSAR Section 6.2 (i.e., the minimum number of Emergency Core Cooling Systems (ECCS), RHRSW loops, and ESW loops needed for accident mitigation).

'B' RHRSW Loop Inoperable

- Unit 2 'A' RHR heat exchanger and associated equipment.
- 'A' RHRSW loop and associated equipment.
- HPCI (Unit 2).
- D11, D21, and D23 EDGs and associated equipment.
- D12 and D24 EDGs and associated equipment to ensure adequate ESW and RHRSW flow. These EDGs are needed since flow verification assumed two (2) operable RHRSW pumps on a loop and all four (4) ESW pumps are operable.
- Any other equipment that, if removed, would place Unit 2 outside the bounds of the analysis described in UFSAR Section 6.2 (i.e., the minimum number of ECCS, RHRSW loops, and ESW loops needed for accident mitigation).

One intended action is to maintain the Unit 2 suppression pool temperature as low as possible during the periods these proposed changes are implemented. This will increase the heat storage capacity of the suppression pool and further enhance the heat removal capacity of the operable RHRSW loop. Also, since Unit 1 will be in a refueling outage, the Unit 1 decay heat removal demand on the RHRSW system will be minimal. Therefore, implementation of the proposed one-time TS changes will not involve a significant reduction in the margin of safety.

Information Supporting an Environmental Assessment

An Environmental Assessment is not required for the changes proposed by this Change Request because the requested changes to the Limerick Generating Station, Unit 2 Technical Specifications conform to the criteria for "actions eligible for categorical exclusion" as specified in 10 CFR 51.22(c)(9). The requested changes will have no impact on the environment. The proposed changes do not involve a significant hazards consideration as discussed in the preceding section. The proposed changes do not involve a significant change in the types or significant increase in the amounts of any effluents that may be released off-site. In addition, the proposed changes do not involve an increase in individual or cumulative occupational radiation exposure.

Conclusion

The Plant Operations Review Committee and the Nuclear Review Board have reviewed these proposed changes to the Limerick Generating Station, Unit 2 Technical Specifications and have concluded that they do involve an unreviewed safety question; however, they do not involve a significant hazards consideration, and will not endanger the health and safety of the public.