Station Support Department

10 CFR 50.90

PECO NUCLEAR
A UNIT OF PECO ENERGY

PECO Energy Company
Nuclear Group Headquarters
965 Chesterbrook Boulevard
Wayne, PA 19087-5691

May 20, 1996

Docket Nos. 50-352
50-353

License Nos. NPF-39
NPF-85

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

Subject: Limerick Generating Station, Units 1 and 2
Technical Specifications Change Request No. 96-12-0

Gentlemen:

PECO Energy Company is submitting Technical Specifications (TS) Change Request No. 96-12-0, in accordance with 10 CFR 50.90, requesting an amendment to the TS (Appendix A) of Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively. This proposed TS change involves revising TS Sections 3/4.4.9.2, 3/4.9.11.1, 3/4.9.11.2, and the associated TS Bases 3/4.4.9 and 3/4.9.11, to more clearly describe that the Residual Heat Removal (RHR) system Shutdown Cooling mode of operation, in Operational Conditions (OPCONs) 4, "Cold Shutdown," and 5, "Refueling," consists of four (4) "subsystems." In addition, the proposed TS change also includes administrative changes to TS Section 3/4.4.9.1 to ensure consistency in terminology regarding the description of Shutdown Cooling "subsystems." The proposed TS changes are consistent with the guidance delineated in the Improved TS (i.e., NUREG-1433, Revision 1, "Standard Technical Specifications General, Electric Plants, BWR/4," dated April 1995) which indicates that the RHR Shutdown Cooling mode of operation is comprised of two (2) loops and four (4) subsystems (i.e., two (2) subsystems per loop). This TS Change Request is being submitted under affirmation, and the required affidavit is enclosed.

We are requesting that, if approved, the amendments to the LGS, Units 1 and 2, TS become effective within 30 days of issuance.

If you have any questions or require additional information, please do not hesitate to contact us.

Very truly yours,

G. A. Hunger, Jr.

G. A. Hunger, Jr.
Director - Licensing

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Attachments
Enclosure

cc: T. T. Martin, Administrator, Region I, USNRC (w/ attachments, enclosure)
N. S. Perry, USNRC Senior Resident Inspector, LGS (w/ attachments, enclosure)
R. R. Janati, Director, PA Bureau of Radiological Protection (w/ attachments, enclosure)

COMMONWEALTH OF PENNSYLVANIA :

: ss.

COUNTY OF CHESTER :

D. B. Fetters, being first duly sworn, deposes and says:

That he is Vice President of PECO Energy Company, the Applicant herein; that he has read the foregoing Technical Specifications Change Request No. 96-12-0 for Limerick Generating Station, Units 1 and 2, Facility Operating License Nos. NPF-39 and NPF-85, concerning the configuration of the Residual Heat Removal (RHR) system during Shutdown Cooling operations, 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.

Vice President

Subscribed and sworn to
before me this 20th day
of May 1996.

Notary Public

Notarial Seal
Mary Lou Skrocki, Notary Public
Tredyffrin Twp., Chester County
My Commission Expires May 17, 1999
Member, Pennsylvania Association of Notaries

ATTACHMENT 1

LIMERICK GENERATING STATION

UNITS 1 AND 2

Docket Nos.	50-352 50-353
License Nos.	NPF-39 NPF-85

TECHNICAL SPECIFICATIONS CHANGE REQUEST

No. 96-12-0

"Describe Availability of Four Subsystems Associated With the Residual Heat Removal System Shutdown Cooling Mode of Operation"

Supporting Information for Changes - 11 pages

PECO Energy Company, Licensee under Facility Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively, requests that the Technical Specifications (TS) contained in Appendix A to the Operating Licenses be amended as proposed herein to revise TS Sections 3/4.4.9.2, 3/4.9.11.1, 3/4.9.11.2, and the associated TS Bases 3/4.4.9 and 3/4.9.11, to more clearly describe that the Residual Heat Removal (RHR) system Shutdown Cooling mode of operation consists of four (4) "subsystems." These TS sections pertain to plant operations during Operational Conditions (OPCONs) 4, "Cold Shutdown" and 5, "Refueling." In addition, the proposed TS change also includes administrative changes to TS Section 3/4.4.9.1 to ensure consistency in terminology regarding the description of Shutdown Cooling "subsystems." The proposed TS changes are consistent with the guidance delineated in the Improved TS (i.e., NUREG-1433, Revision 1, "Standard Technical Specifications General Electric Plants, BWR/4," dated April 1995) which indicates that the RHR Shutdown Cooling mode of operation is comprised of two (2) loops and four (4) subsystems (i.e., two (2) subsystems per loop). The proposed changes to the TS are shown on the attached mark-up of TS pages 3/4 4-25, 3/4 4-26, 3/4 9-17, 3/4 9-18, and TS Bases pages B 3/4 4-6 and B 3/4 9-2. The TS pages showing the proposed changes are contained in Attachment 2.

PECO Energy is requesting that, if approved, the amendments to the LGS, Units 1 and 2, TS become effective within 30 days of issuance of the amendments.

This TS Change Request 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.

Discussion and Description of the Proposed Changes

The proposed TS changes are consistent with the guidance delineated in the Improved Technical Specifications (i.e., NUREG-1433, Revision 1, "Standard Technical Specifications, General Electric Plants, BWR/4," dated April 1995). Currently, when referring to the RHR Shutdown Cooling operations, the TS generally describe the system configuration in terms of "loops" (i.e., "A" and "B" loops). Each "loop" consists of a single heat exchanger, two (2) pumps, and associated piping and valves. The proposed changes maintain these general descriptions, but introduce the concept of "subsystems" when describing the RHR Shutdown Cooling mode of operation in OPCONs 4 and 5, in a manner consistent with guidance specified in NUREG-1433, Revision 1.

NUREG-1443, Revision 1, indicates that RHR Shutdown Cooling is comprised of two (2) "loops," with each loop consisting of two (2) "subsystems." The proposed changes will define an RHR Shutdown Cooling "subsystem" during OPCONs 4 and 5, as consisting of a heat exchanger (a passive component) aligned, or capable of being aligned, to a single RHR pump. As a result, there will be four (4) RHR Shutdown Cooling "subsystems" available (i.e., two (2) "subsystems" comprising a single "loop"). These RHR Shutdown Cooling "subsystems" and "loops" are described below.

"A" Loop Subsystems

- "A" Heat Exchanger and "A" RHR Pump
- "A" Heat Exchanger and "C" RHR Pump

"B" Loop Subsystems

- "B" Heat Exchanger and "B" RHR Pump
- "B" Heat Exchanger and "D" RHR Pump

The requirements of TS Section 3/4.4.9.1, "Hot Shutdown," are not changed by this proposed TS change. In OPCON 3* (i.e., HOT SHUTDOWN condition with the reactor pressure vessel pressure below the Shutdown Cooling cut-in permissive of 75 psig), the TS for Suppression Pool Spray and Suppression Pool Cooling requires that two (2) independent loops be operable in OPCONs 1, 2, and 3. As a result, both RHR heat exchangers are required to be operable throughout OPCON 3. Therefore, the changes to TS Section 3/4.4.9.1 are administrative only and provide for consistent use of terminology. The intent and requirements of this TS Section are not changed.

The following provides a description of the existing, pertinent TS requirements.

Current TS Requirements

1) Section 3.4.9.1, "Hot Shutdown," currently requires that two (2) Shutdown Cooling mode loops of the RHR system be OPERABLE, and, unless at least one (1) recirculation pump is in operation, at least one (1) Shutdown Cooling mode loop be in operation with each loop consisting of at least:

   a. One (1) OPERABLE RHR pump, and
   b. One (1) OPERABLE RHR heat exchanger.

2) Section 4.4.9.1, "Hot Shutdown," currently requires that at least one (1) Shutdown Cooling loop of the RHR system or alternate method be determined to be in operation and circulating reactor coolant at least once per 12 hours.

3) Section 3.4.9.2, "Cold Shutdown," currently requires that two (2) Shutdown Cooling mode loops of the RHR system be OPERABLE, and, unless at least one (1) recirculation pump is in operation, at least one (1) Shutdown Cooling mode loop be in operation with each loop consisting of at least:

   a. One (1) OPERABLE RHR pump, and
   b. One (1) OPERABLE RHR heat exchanger.

4) Section 4.4.9.2, "Cold Shutdown," currently requires that at least one (1) Shutdown Cooling loop of the RHR system or alternate method be determined to be in operation and circulating reactor coolant at least once per 12 hours.

5) Section 3.9.11.1, "High Water Level," currently requires that at least one (1) Shutdown Cooling mode loop of the RHR system be OPERABLE and in operation with at least:

   a. One (1) OPERABLE RHR pump, and
   b. One (1) OPERABLE RHR heat exchanger.

6) Section 4.9.11.1, "High Water Level," currently requires that at least one (1) Shutdown Cooling mode loop of the RHR system or alternate method be verified to be in operation and circulating reactor coolant at least once per 12 hours.

7) Section 3.9.11.2, "Low Water Level," currently requires that two (2) Shutdown Cooling mode loops of the RHR system be OPERABLE and at least one (1) loop be in operation, with each loop consisting of at least:

   a. One (1) OPERABLE RHR pump, and
   b. One (1) OPERABLE RHR heat exchanger.

8) Section 4.9.11.2, "Low Water Level," currently requires that at least one (1) Shutdown Cooling mode loop of the RHR system or alternate method be verified to be in operation and circulating reactor coolant at least once per 12 hours.

The following provides a description of the proposed changes to the affected TS Sections.

Proposed TS Changes

1) Revise Section 3.4.9.1 to incorporate consistent terminology with respect to RHR Shutdown Cooling "subsystems," to require that two (2) independent RHR Shutdown Cooling "subsystems" shall be OPERABLE, and, with no recirculation pump in operation, at least one (1) RHR Shutdown Cooling "subsystem" shall be in operation.

2) Revise Section 4.4.9.1 to incorporate consistent terminology with respect to RHR Shutdown Cooling "subsystems," to require that at least once per 12 hours verify one (1) independent RHR Shutdown Cooling "subsystem" or alternate method is operating.

3) Revise Section 3.4.9.2 to incorporate the guidance delineated in NUREG-1433, Revision 1, which stipulates that two (2) RHR Shutdown Cooling subsystems shall be OPERABLE, and, with no recirculation pump in operation, at least one (1) RHR Shutdown Cooling subsystem shall be in operation.

4) Revise Section 4.4.9.2 to incorporate the guidance delineated in NUREG-1433, Revision 1, which stipulates that once per 12 hours verify one (1) RHR Shutdown Cooling subsystem or recirculation pump is operating.

5) Revise TS Bases 3/4.4.9 to incorporate portions of the Bases description provided in NUREG-1433, Revision 1, concerning RHR system alignment and operation for Shutdown Cooling in OPCON 4.

6) Revise Section 3.9.11.1 to incorporate the guidance delineated in NUREG-1433, Revision 1, which stipulates that one (1) RHR Shutdown Cooling subsystem shall be OPERABLE and in operation.

7) Revise Section 4.9.11.1 to incorporate the guidance delineated in NUREG-1433, Revision 1, which stipulates that once per 12 hours verify one (1) RHR Shutdown Cooling subsystem is operating.

8) Revise Section 3.9.11.2 to incorporate the guidance delineated in NUREG-1433, Revision 1, which stipulates that two (2) RHR Shutdown Cooling subsystems shall be OPERABLE, and one (1) RHR Shutdown Cooling subsystem shall be in operation.

9) Revise Section 4.9.11.2 to incorporate the guidance delineated in NUREG-1433, Revision 1, which stipulates that once per 12 hours verify one (1) RHR Shutdown Cooling subsystem is operating.

10) Revise TS Bases 3/4.9.11 to incorporate portions of the Bases description provided in NUREG-1433, Revision 1, concerning RHR system alignment and operation for Shutdown Cooling in OPCON 5.

Safety Assessment

The RHR system is comprised of four (4) independent loops. Each loop contains a motor-driven pump, piping, valves, instrumentation, and controls. In addition, two (2) of the loops (i.e., "A" and "B") contain heat exchangers that are cooled by the Residual Heat Removal Service Water (RHRSW) system. The RHR system can be operated in one (1) of the following four (4) different modes of operation.

- Low Pressure Coolant Injection (LPCI) Mode
- Suppression Pool Cooling Mode
- Shutdown Cooling Mode
- Containment Spray Cooling Mode

In the Shutdown Cooling mode of operation, the RHR system takes suction from the reactor recirculation system and discharges back to the reactor vessel via the reactor recirculation system. The functional design basis of the Shutdown Cooling mode is to have the capability to remove decay and sensible heat from the reactor primary system in order to reduce reactor coolant temperature to 125°F, approximately 20 hours after the control rods have been inserted, and to permit refueling when the RHRSW temperature is less than 85°F. The plant can be shutdown using the capacity of a single RHR heat exchanger and related RHRSW cooling capability.

The Shutdown Cooling mode of the RHR system is manually initiated and can be controlled by an operator in the Main Control Room. Shutdown Cooling is not required for accident mitigation. Two (2) separate Shutdown Cooling loops are available, and although both loops may be employed for shutdown, the raactor coolant can be brought to 212°F in less than approximately 20 hours with only one (1) loop in operation.

The existing TS requirements for Shutdown Cooling currently state that one (1) operable loop of Shutdown Cooling is required during OPCON 5 when at High Water Level (i.e., TS 3.9.11.1), and two (2) operable loops of Shutdown Cooling are required during OPCONs 3*, 4, and 5 when at Low Water Level (i.e., TS 3.4.9.1, 3.4.9.2, and 3.9.11.2, respectively). This proposed TS change involves modifying the designations currently specified in the TS in accordance with the guidance stipulated in the Bases of NUREG-1433, Revision 1. This involves revising the TS to stipulate operability of two (2) Shutdown Cooling "subsystems," with each "subsystem" consisting of one (1) RHR pump, heat exchanger, and piping flowpath. As a result, a Shutdown Cooling "subsystem" may be considered OPERABLE if it can be manually (locally or remotely) aligned for use. Therefore, even a single active component failure such as a Shutdown Cooling discharge valve failure to open would not prevent operability of the associated Shutdown Cooling "subsystem", if the valve could be manually opened. This will permit, in OPCONs 4 and 5, the use of common passive components such as the heat exchanger and discharge piping. The requirements associated with this TS Section are not changed, i.e., during Hot Shutdown (OPCON 3*) condition: two (2) independent RHR Shutdown Cooling "subsystems" will still be required to be OPERABLE, meaning that both RHR heat exchangers, each with at least one (1) OPERABLE RHR pump, continue to be required. The changes to TS Section 3/4.4.9.1 are administrative in nature and do not affect the intent or requirements of this TS.

The use of common passive heat exchangers does not extend to TS Section 3/4.4.9.1, "Hot Shutdown," or post-accident conditions, which are reflected in TS Sections 3.6.2.2 and 3.6.2.3 for operability of Suppression Pool Spray and Suppression Pool Cooling (also used for alternate Shutdown Cooling capability). These requirements, which are not changed by the four (4) Shutdown Cooling "subsystem" designation, require the operability of two (2) independent loops in OPCONs 1,2, and 3, meaning two

(2) operable RHR heat exchangers and at least one (1) operable RHR pump per heat exchanger. In this way, a single active failure occurring post-accident, when manual action is not available to correct the condition (e.g., the failure of a Suppression Pool Cooling discharge valve to open), will not disable both Suppression Pool Cooling or Spray loops.

This position follows the guidance stipulated in the Bases of NUREG-1433, Revision 1, and credits the RHR Shutdown Cooling mode design at LGS as having four (4) potentially available "subsystems" (i.e., "A" RHR pump and "A" RHR heat exchanger; "C" RHR pump and "A" heat exchanger; "B" RHR pump and "B" heat exchanger; "D" RHR pump and "B" heat exchanger; with the common suction piping and respective discharge piping). NUREG 1433, Revision 1, states:

> "The two subsystems have a common suction source and are allowed to have a common heat exchanger and common discharge piping. Thus, to meet the LCO [of two operable SDC subsystems], both pumps in one loop or one pump in each of the two loops must be operable. Since the piping and heat exchangers are passive components that are assumed not to fail, they are allowed to be common to both [paired] subsystems."

The four (4) "subsystem" designation has no effect on the required operability of the RHRSW system. As required by TS 3.7.1.1, the RHRSW subsystem(s) associated with the required operable RHR heat exchanger(s) will continue to remain operable. Each operable RHRSW subsystem consists of two (2) operable pumps and the required operable flowpath to provide decay heat removal via the associated RHR heat exchanger.

The RHRSW system piping is designed, fabricated, inspected, and tested in accordance with the requirements of ASME, Section III, Class 3, and each RHRSW subsystem is single active failure proof in that the failure of a motor-operated valve, diesel generator, or pump does not prevent the system from performing its intended safety function.

The required availability of four (4) loops of the Low Pressure Coolant Injection (LPCI) mode of RHR during OPCONs 1, 2, and 3 as required by TS Section 3.5.1 is also not affected by the four (4) "subsystem" Shutdown Cooling designation. No change to any RHR system instrumentation logic, required Emergency Core Cooling System (ECCS) availability, or method of operation is involved.

NUREG-1433, Revision 1, also re-affirms that each Shutdown Cooling "subsystem" is considered operable if it can be manually aligned, remotely or locally, in the shutdown cooling mode for removal of decay heat. Thus, a LPCI-dedicated pump can be aligned for LPCI automatic initiation, yet still be considered part of an operable Shutdown Cooling subsystem as long as it can be re-aligned for Shutdown Cooling.

Moderate Energy Line Break (MELB)

The designation of the LGS Shutdown Cooling mode of RHR as a four (4) subsystem design reflects the current guidance stipulated in NUREG 1433, Revision 1, "Standard Technical Specifications, General Electric Plants, BWR/4," April 1995. NUREG-1433, Revision 1, states that for Shutdown Cooling operability in OPCONs 3*, 4, and 5 (Low Water Level), the RHR heat exchanger and discharge piping can be shared by the paired pumps in each loop since: "...the piping and heat exchangers are passive components that are assumed not to fail." This is an extension of the methodology that has previously existed which credits the sharing between both "A" and "B" RHR loops (and all four (4) RHR pumps) of the common Shutdown Cooling suction piping, although requirements for alternate means of Shutdown Cooling suction (i.e., alternate Shutdown Cooling capability) have been analyzed since the Shutdown

Cooling suction piping contains active components (i.e., Shutdown Cooling suction valves HV-051-1(2) F008 and HV-051-1(2) F009 valves). Similarly, alternate means of returning cooling water to the reactor pressure vessel (e.g., LPCI return) have been analyzed in the event of failure of Shutdown Cooling return valves.

The guidance specified in NUREG-1433, Revision 1, that the heat exchangers and piping are "passive" components, and assumed not to fail, is supported in OPCONs 4 and 5 in the NRC's Standard Review Plan (SRP), Section 3.6.1, "Plant Design for Protection Against Postulated Piping Failures in Fluid Systems Outside Containment." This SRP section defines conditions for high and moderate energy line breaks (HELB/MELB), and states that essential systems and components should be protected against postulated piping failures in high or moderate energy fluid systems (i.e., RHR Shutdown Cooling is a moderate energy system) that operate during normal plant conditions. Appendix A to this SRP section defines normal plant conditions as those occurring during startup, operation at power, hot standby (hot shutdown), or reactor cooldown to cold shutdown condition. COLD SHUTDOWN and REFUELING conditions are excluded from those requiring postulation of a HELB or MELB occurrence.
This is further supported by the SRP's statement that: "...the plant design for protection against [HELB and MELB] piping failures outside containment is reviewed to assure that such failures would not cause the loss of needed functions of safety-related systems and to assure that the plant could be safely shut down in the event of such failures."

LGS Updated Final Safety Analysis Report (UFSAR) Section 3.6.1.1 lists the stated objectives of the HELB/MELB Program as: a.) shutting the reactor down safely; b.) maintaining primary containment integrity; and c.) maintaining off-site radiological doses below the requirements of 10CFR100. While objective c.) is always applicable, objectives a.) and b.) do not apply to refueling operation conditions. As indicated in UFSAR Section 3.6.1.1, the RHR system is designed, constructed, and inspected to standards appropriate for nuclear safety systems. It can be reasoned that since the Shutdown Cooling piping is always pressurized under all plant conditions, except when removed from service specifically for maintenance, any leakage from a developing through-wall crack (the failure mode of MELB piping) would be readily discovered and repaired prior to the need for initiation of Shutdown Cooling.

In summary, the statements in NUREG-1433, Revision 1, SRP Section 3.6.1, and UFSAR Section 3.6.1, indicate that the occurrence of pipe cracks in the common Shutdown Cooling discharge piping is not a credible failure in OPCONS 4 and 5, and therefore, a MELB review is not required for Shutdown Cooling.

Single Failure

The NUREG-1433, Revision 1, statement that the RHR heat exchanger is a passive component that is assumed not to fail is consistent with the position that the single failure criterion in this case applies to active components. Two (2) Shutdown Cooling subsystems are required in OPCONS 3*, 4, and 5 (Low Water Level), despite the fact that one (1) Shutdown Cooling subsystem is adequate for decay heat removal under these plant conditions. This is to allow for the postulated failure of an active component (e.g., a motor-operated valve or RHR pump). The NRC's report on the single failure criterion, SECY-77-439, "Single Failure Criterion," makes the following statement:

> "...the probability of most types of passive failures in fluid systems is sufficiently small that they need not be assumed in addition to the initiating failure in application of the single failure criterion to assure safety of a nuclear plant."

A single active failure is defined in both SRP Section 3.6.1, Appendix A, and LGS UFSAR Section 3.6.3 as: "...considered to be a loss of component function as a result of mechanical, hydraulic, pneumatic, or electrical malfunction, but not the loss of component structural integrity." Thus, the loss of an active

component, whether shared between common subsystems such as a motor-operated valve, or particular to an individual subsystem, such as a pump, does not mean a loss of pressure boundary integrity of the common portions of the subsystems, and a further passive component failure or pipe break need not be assumed.

The accident analyses in Chapter 15 of the LGS UFSAR discuss how single active failure criteria are applied to design basis accidents, and how single active failures and single operator errors are applied to transient events. By definition, these analyses are not required to assume the failure of passive fluid system components. UFSAR Section 15.2.9 details the analyses of the failure of RHR Shutdown Cooling, and identifies the worst case single failure as that of a Shutdown Cooling suction valve. The Nuclear Safety Operational Analysis in UFSAR Section 15.9 includes Event 18 as loss of Shutdown Cooling and states that for most single failures, Shutdown Cooling is re-established using redundant equipment. For failure of the Shutdown Cooling suction line, alternate Shutdown Cooling is established utilizing suction from the suppression pool. No passive failure of the heat exchanger is required to be postulated for these analyses.

The design basis for operability of Shutdown Cooling with a single active failure is met through the availability of the alternate cooling flowpaths. As stated in UFSAR Sections 15.2.9 and 15.2.9.3.4.2, the first action to be taken upon the (worst case) failure of a Shutdown Cooling suction valve is to gain access to the suction line and attempt to effect repairs. If this can not be accomplished, alternate cooling flowpaths are established in accordance with the remaining functional systems assuming, as an additional failure, the loss of an electrical division. With the four (4) "subsystem" Shutdown Cooling configuration, in the event of a failure of a Shutdown Cooling return valve or check valve, manual actions to effect repairs of the valve will be taken. Should these actions fail, the same analyzed alternate available flowpaths used for failure of a suction valve will allow for return of cooled water to the reactor vessel. Hence, with four (4) "subsystems" of Shutdown Cooling, the requirement for continued availability of Shutdown Cooling following single active failures continues to be satisfied.

AC and DC electrical power for the RHR subsystems' pumps is provided by separate divisions from both offsite and onsite sources. Thus, although Appendix R fires need not be postulated during shutdown conditions, failure of an electrical division can not prevent the redundant RHR subsystems, with available manual corrective action as required, from performing the Shutdown Cooling functions.

Other Considerations

While not required to be postulated per NUREG-1433, Revision 1, as discussed above, the passive failure of the RHR heat exchanger in the form of a tube leak has been considered. In such an event, the RHR fluid would leak into the RHRSW, potentially contaminating the Spray Pond and/or cooling tower basin. If the leak were quantified and determined to be minor, the decision to continue normal Shutdown Cooling operation could be made, with radiological effects confined to the station. The potential for release to the offsite environment would need to be carefully evaluated, but any effect on RHR Shutdown Cooling efficiency would be very small (i.e., the ability of the system to continue to provide the necessary cooling would not be significantly affected).

Other station procedures address the steps necessary in the event of a loss of Shutdown Cooling. In addition, alternate methods of decay heat removal could be applied (i.e., Reactor Water Cleanup, Spent Fuel Pool Cooling once flooded up, etc.) to augment any reduced RHR effectiveness. Existing procedures identify the effectiveness of these methods and at what period of time following reactor shutdown they can be considered as sufficient to remove all generated decay heat.

These temporary compensatory measures could be taken in addition to expediting the restoration of the out-of-service RHR heat exchanger for removal of decay heat.

Summary

The proposed TS changes are being requested to more clearly describe the RHR system configuration associated with the Shutdown Cooling mode of operation in OPCONs 4 and 5. These TS proposed changes are being made in accordance with the guidance stipulated in NUREG-1433, Revision 1, as it relates to Shutdown Cooling operations in OPCONs 4 and 5.

Information Supporting a Finding of No Significant Hazards Consideration

We have concluded that the proposed changes to Limerick Generating Station (LGS), Units 1 and 2, Technical Specifications (TS) to revise TS Sections 3/4.4.9.1, 3/4.4.9.2, 3/4.9.11.1, 3/4.9.11.2, and the associated TS Bases 3/4.4.9 and 3/4.9.11, to incorporate the guidance stipulated in NUREG-1433, Revision 1, "Standard Technical Specifications General Electric Plants, BWR/4," dated April 1995, pertaining to the Residual Heat Removal (RHR) system Shutdown Cooling mode of operation, do not involve 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 TS changes do not involve any physical changes to plant structures systems, or components. The RHR Shutdown Cooling mode of operation is manually controlled and is not required for accident mitigation. The RHR system will continue to function as designed in all modes of operation. The consequences of equipment malfunction are not changed from those in existing analyses, with no increase in onsite or offsite radiological effects. The RHR system will continue to function as designed to mitigate the consequences of an accident and resultant onsite and offsite radiological effects remain as previously evaluated. The proposed TS changes will revise the TS to more clearly describe the RHR system configuration in OPCONs 4 and 5. The proposed changes are consistent with the guidance stipulated in NUREG-1433, Revision 1.

   The four (4) "subsystem" Shutdown Cooling designation permits operability of only one (1) RHR heat exchanger for Shutdown Cooling service in Operational Conditions (OPCONs) 4 and 5, as long as both associated RHR pumps are operable and alignable for Shutdown Cooling. TS requirements for RHR Shutdown Cooling operation in Hot Shutdown, Suppression Pool Spray, and Suppression Pool Cooling continue to require two (2) independent loops to be operable in OPCONs 1, 2, and 3*, meaning both RHR heat exchangers will still be required to be operable throughout OPCON 3.

   The four (4) "subsystem" Shutdown Cooling designation has no effect on the required operability of the Residual Heat Removal Service Water (RHRSW) system. As required by TS Section 3.7.1.1, the RHRSW subsystem(s) associated with the required operable RHR heat exchanger(s) will continue to remain operable. Each operable RHRSW subsystem consists of two (2) operable pumps and the required operable flowpath to provide decay heat removal via the associated RHR heat exchanger.

   The RHRSW system piping is designed, fabricated, inspected, and tested in accordance with the requirements of ASME, Section III Class 3, and each RHRSW subsystem is single active failure proof in that the failure of a motor-operated valve, diesel generator, or pump does not prevent the system from performing its safety function.

The required availability of four (4) loops of the Low Pressure Coolant Injection (LPCI) mode of RHR during OPCONs 1, 2, and 3 as required by TS Section 3.5.1 is not impacted by the four (4) "subsystem" Shutdown Cooling designation. No change to any RHR system instrumentation logic, required Emergency Core Cooling System (ECCS) availability, or method of operation is involved.

NUREG-1433, Revision 1, also re-affirms that each Shutdown Cooling "subsystem" is considered operable if it can be manually aligned, remotely or locally, in the shutdown cooling mode for removal of decay heat. Thus, a LPCI-dedicated pump can be aligned for LPCI automatic initiation, yet still be considered part of an operable shutdown cooling subsystem as long as it can be re-aligned for Shutdown Cooling.

Therefore, the proposed TS changes do not involve an increase in the probability or consequences of an accident previously evaluated.

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

The proposed TS changes do not involve any physical changes to plant structures, systems, or components. The RHR system will continue to function as designed in all modes of operation. No new accident type is created as a result of the proposed changes. No new failure mode for any equipment is created. The changes are consistent with the guidance provided in NUREG-1433, Revision 1, pertaining to RHR Shutdown Cooling operation in OPCONs 4 and 5.

The four (4) "subsystem" Shutdown Cooling designation has no effect on the required operability of the RHRSW system. The RHRSW subsystem(s) associated with the required operable RHR heat exchanger(s) will continue to remain operable as required by TS Section 3.7.1.1. Each operable RHRSW subsystem consists of two (2) operable pumps and the required operable flowpath to provide decay heat removal via the associated RHR heat exchanger.

The RHRSW system piping is designed, fabricated, inspected, and tested in accordance with the requirements of ASME, Section III, Class 3, and each RHRSW subsystem is single active failure proof in that the failure of a motor-operated valve, diesel generator, or pump does not prevent the system from performing its safety function.

The required availability of four (4) loops of the LPCI mode of RHR during OPCONs 1, 2, and 3 as required by TS Section 3.5.1 and 3.5.2 is not impacted by the four (4) "subsystem" Shutdown Cooling designation. No change to any RHR system instrumentation logic, required ECCS availability, or method of operation is involved.

NUREG-1433, Revision 1, also re-affirms that each Shutdown Cooling "subsystem" is considered operable if it can be manually aligned, remotely or locally, in the Shutdown Cooling mode for removal of decay heat. Thus, a LPCI-dedicated pump can aligned be for automatic LPCI initiation, yet still be considered part of an operable shutdown cooling subsystem as long as it can be re-aligned for Shutdown Cooling.

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

3. The proposed TS changes do not involve a significant reduction in a margin of safety.

Although the Bases for TS Sections 3/4.4.9.2, 3/4.9.11.1, and 3/4.9.11.2 are being revised in support of this proposed TS change, the changes only involve providing clarification regarding the designation of the RHR Shutdown Cooling operation configuration in OPCONs 4 and 5. The proposed TS changes do not involve any physical changes to plant structures, systems, or components. The RHR system will continue to function as designed in all modes of operation. The consequences of equipment malfunction are not changed from those in existing analyses, with no increase in onsite or offsite radiological effects. The RHR system will continue to function as designed to mitigate the consequences of an accident and resultant onsite and offsite radiological effects remain as previously evaluated. The proposed changes are consistent with the guidance stipulated in NUREG-1433, Revision 1.

The four (4) "subsystem" Shutdown Cooling designation has no effect on the required operability of the RHRSW system. As required by TS 3.7.1.1, the RHRSW subsystem(s) associated with the required operable RHR heat exchanger(s) will continue to remain operable. Each operable RHRSW subsystem consists of two (2) operable pumps and the required operable flowpath to provide decay heat removal via the associated RHR heat exchanger.

The RHRSW system piping is designed, fabricated, inspected, and tested in accordance with the requirements of ASME, Section III, Class 3, and each RHRSW subsystem is single active failure proof in that the failure of a motor-operated valve, diesel generator, or pump does not prevent the system from performing its safety function. (In the same manner that manual action may be required for RHR system alignment in OPCONs 4 and 5 with one (1) RHR heat exchanger operable, a failure of the motor-operated RHRSW inlet or outlet heat exchanger isolation valves may require manual positioning for the required alignment.)

The required availability of four (4) loops of the LPCI mode of RHR during OPCONs 1, 2, and 3* as required by TS Section 3.5.1 is not affected by the four (4) "subsystem" Shutdown Cooling configuration. No change to any RHR system instrumentation logic, required ECCS availability, or method of operation is involved.

NUREG-1433, Revision 1, also re-affirms that each Shutdown Cooling "subsystem" is considered operable if it can be manually aligned, remotely or locally, in the Shutdown Cooling mode for removal of decay heat. Thus, a LPCI-dedicated pump can be aligned for LPCI automatic initiation, yet still be considered part of an operable Shutdown Cooling "subsystem" as long as it can be re-aligned for Shutdown Cooling.

Therefore, the proposed TS changes do not involve a significant reduction in a 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 LGS, Units 1 and 2, TS 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 effluent that may be released offsite. In addition, the proposed changes do not involve a significant increase in individual or cumulative occupational radiation exposure.

Conclusion

The Plant Operations Review Committee and the Nuclear Review Board have reviewed the proposed changes to the LGS, Units 1 and 2, TS and have concluded that they do not involve an unreviewed safety question, and will not endanger the health and safety of the public.