Station Support Department

10 CFR 50.90

PECO ENERGY

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

May 6, 1994

Docket No. 50-352

License No. NPF-39

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

Subject: Limerick Generating Station, Unit 1
Technical Specifications Change Request No. 94-20-1

Gentlemen:

PECO Energy Company is submitting Technical Specifications (TS) Change Request No. 94-20-1, in accordance with 10 CFR 50.90, requesting an amendment to the TS (i.e., Appendix A) of Facility Operating License No. NPF-39 for Limerick Generating Station (LGS) Unit 1. This proposed TS change involves revising TS Section 5.5.3, "Capacity," to permit an interim increase in the spent fuel storage capacity in the Unit 1 Spent Fuel Pool (SFP) from 2040 fuel assemblies to 2500 fuel assemblies.

In a previous TS Change Request (i.e., 93-19-0), submitted by letter dated January 14, 1994, PECO Energy requested that the LGS, Units 1 and 2, TS be revised to support the implementation of a modification to install new high density spent fuel storage racks in the Unit 1 and Unit 2 SFPs to permit increasing the spent fuel storage capacity from 2040 fuel assemblies to 4117 fuel assemblies. In our January 14, 1994 letter, we requested approval of TS Change Request 93-19-0 by June 15, 1994, to facilitate implementation of the reracking modification. Subsequently, during a meeting between PECO Energy and NRC representatives on April 15, 1994, the NRC indicated that it could not complete its review and issue the TS amendments in a manner timely enough to support our modification implementation schedule. However, the NRC did indicate that it would be amenable to reviewing and approving a TS change for Unit 1 to permit an interim increase in the spent fuel storage capacity up to 2862 fuel assemblies which is supported by the existing design analysis for the Spent Fuel Pools at LGS.

Accordingly, we are submitting TS Change Request 94-20-1 requesting that the LGS Unit 1 TS be revised to allow for an interim increase in the spent fuel storage capacity from 2040 fuel assemblies to only 2500 fuel assemblies. Information supporting this TS Change Request is contained in Attachment 1 of this letter, and the proposed replacement pages for the LGS Unit 1 TS are contained in Attachment 2. This information is being submitted under affirmation, and the required affidavit is enclosed.

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We request that, if approved, the amendment to the LGS Unit 1 TS be issued and effective by June 30, 1994, to facilitate implementation of the reracking modification.

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

Very truly yours,

G. A. Hunger, Jr.
Director
Licensing Section

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 Radiation Protection (w/ attachments, enclosure)

COMMONWEALTH OF PENNSYLVANIA :

: ss.

COUNTY OF CHESTER :

W. H. Smith, III, 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. 94-20-1 for Limerick Generating Station, Unit 1, Facility Operating License No. NPF-39, to permit an interim increase in the Unit 1 spent fuel storage capacity from 2040 fuel assemblies to 2500 fuel assemblies, 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.

William H Smith III

Vice President

Subscribed and sworn to

before me this 4th day

of May 1994.

[signature]

Notary Public

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

ATTACHMENT 1

LIMERICK GENERATING STATION

UNIT 1

Docket No. 50-352

License No. NPF-39

TECHNICAL SPECIFICATIONS CHANGE REQUEST

No. 94-20-1

"Revise Technical Specifications to Permit Interim Increase
in the Unit 1 Spent Fuel Storage Capacity
from 2040 Fuel Assemblies to 2500 Fuel Assemblies"

Supporting Information for Changes - 11 Pages

PECO Energy Company, Licensee under Facility Operating License No. NPF-39 for Limerick Generating Station (LGS) Unit 1, requests that the Technical Specifications (TS) contained in Appendix A to the Operating License be amended as proposed herein, to revise TS Section 5.5.3, "Capacity," to facilitate an interim increase in the spent fuel pool storage capacity for the Unit 1 Spent Fuel Pool (SFP). This proposed TS change is necessary to support implementation of a modification to install new high density spent fuel storage racks in each of the SFPs at LGS. This proposed TS change involves revising the Unit 1 TS to increase the spent fuel storage capacity from 2040 fuel assemblies to 2500 fuel assemblies. The proposed change to the TS is indicated by a vertical bar in the margin of TS page 5-8. The TS page identifying the proposed change is contained in Attachment 2.

We request that the NRC review the TS change proposed herein and, if approved, issue the amendment, effective upon issuance, by June 30, 1994, to facilitate implementation of the modification.

This TS Change Request provides a discussion and description of the proposed TS change, a safety assessment of the proposed TS change, information supporting a finding of No Significant Hazards Consideration, and Information Supporting an Environmental Assessment.

Discussion and Description of the Proposed Change

Currently, the Limerick Generating Station (LGS) Unit 1 Technical Specifications (TS) limits the amount of spent fuel that can be stored in the Spent Fuel Pool (SFP) to 2040 fuel assemblies. This proposed TS change involves revising TS Section 5.5.3, "Capacity," to support an interim increase in the spent fuel storage capacity in the Unit 1 SFP from 2040 fuel assemblies to 2500 fuel assemblies. This proposed TS change is necessary to support the implementation of a modification to install new high density spent fuel storage racks in the LGS, Units 1 and 2, SFPs.

In a previous TS Change Request (i.e., 93-19-0), submitted by letter dated January 14, 1994, PECO Energy requested that the LGS, Units 1 and 2, TS be revised to support the implementation of a modification to install new high density spent fuel storage racks in the LGS, Units 1 and 2, SFPs. Installation of these new high density spent fuel storage racks will increase the spent fuel storage capacity in each SFP from 2040 fuel assemblies to 4117 fuel assemblies. In our January 14, 1994 letter, we requested approval of TS Change Request 93-19-0 by June 15, 1994, to facilitate implementation of the reracking modification. Subsequently, during a meeting between PECO Energy and NRC representatives on April 15, 1994, the NRC indicated that it could not complete its review and issue the TS amendments in a manner timely enough to support our modification implementation schedule. However, the NRC did indicate that it would be amenable to reviewing and approving a TS change for Unit 1 only to permit an interim increase in the spent fuel storage capacity up to 2862 fuel assemblies which is supported by the existing design analysis for the SFPs at LGS.

Current plans are to install the new high density racks in the Unit 2 SFP first. To accommodate this activity, all of the spent fuel currently stored in the Unit 2 SFP will be transferred to the Unit 1 SFP for temporary storage. This will necessitate relocating six (6) of the existing Unit 2 spent fuel storage racks to the Unit 1 SFP to ensure that an adequate number of storage cells are available for the storage of all the existing spent fuel assemblies at LGS. Transferring all of the spent fuel to the Unit 1 SFP will enable the reracking operation for Unit 2 to be performed with no spent fuel in the SFP.

The reracking modification work is scheduled to begin on Unit 2 at the end of June 1994. Allowing for an interim increase in the spent fuel storage capacity in the Unit 1 SFP from 2040 fuel assemblies to 2500 fuels assemblies, as requested by this proposed TS change, will facilitate the implementation of the SFP reracking modification efforts, as scheduled. Increasing the storage capacity in the Unit 1 SFP to 2500 fuel assemblies, will provide adequate space to accommodate all of the existing LGS, Units 1 and 2, spent fuel assemblies, and all the fuel assemblies being shipped from the Shoreham Nuclear Power Station to LGS.

Safety Assessment

The spent fuel storage facility at Limerick Generating Station (LGS), Units 1 and 2, provides specially designed underwater storage space for the storage of new and spent fuel assemblies. The facility is located in the refueling area which is common for both units. Each unit at LGS has its own Spent Fuel Pool (SFP), which are of similar design. A description of the existing SFP design, existing fuel storage racks, and fuel pool cooling capability is provided below.

SFP Design

The LGS Unit 1 SFP is an elevated reinforced concrete structure with post-tensioned girders flanking the north and south extremities of a 72-inch thick reinforced concrete slab. The Unit 1 SFP is currently licensed to store no more than 2040 fuel assemblies. However, the SFP is currently analyzed to store 2862 spent fuel assemblies. The SFP has a volume of approximately 46,000 ft^3 and is filled with demineralized water to a normal depth of 38 feet 3 inches (38'-3"). This provides approximately 23 feet of water above the tops of the stored fuel assemblies.

The existing structural analysis for the Unit 1 SFP is based on the storage of 2862 fuel assemblies. This analysis is additionally conservative in that it assumes a 2000 lbs/ft^2 floor loading for the storage racks and spent fuel; whereby, the actual floor loading is only 1600 lbs/ft^2 for the storage racks and spent fuel.

The Unit 1 SFP is lined with stainless steel plate to minimize leakage and reduce corrosion product formation. A leakage collection system is provided to permit expedient detection of leaks through the stainless steel liner plate and to prevent the uncontrolled loss of pool water to areas below the pool. Drainage paths are formed in the floor slab below the floor liner, and are designed to permit free gravity flow. The design of the drainage system is described in Section 9.1 of the LGS Updated Final Safety Analysis Report (UFSAR). Any SFP leakage is routed through a piping system which is provided at the base of the pool wall and is directed to one (1) of three (3) dirty radwaste funnels.

Leakage is detected by observation of water flowing out of the piping into the dirty radwaste funnel, or by low-level indication in the SFP skimmer surge tank, or the SFP itself. Flow into the funnels is observed during periodic operator inspections. Skimmer surge tank low-level alarms and trips are also provided as described in Section 9.1.3.5 of the LGS UFSAR.

To ensure that the SFP water level is not lowered by a malfunction of the Fuel Pool Cooling and Cleanup (FPCC) system, the system takes suction from the pool near the normal water level via the skimmer surge tanks. The system's return lines enter the SFP from above the normal water level and are provided with siphon breaker holes near the normal water level to preclude the possibility of siphoning the pool.

The SFP structure is designed in accordance with seismic Category I requirements as specified in Section 3.2 of the LGS UFSAR. The components and supporting structures of any system, equipment, or structure that is not seismic Category I and whose collapse could result in loss of a required function of the spent fuel storage facility are analytically checked to determine that they will not collapse when subjected to seismic loading resulting from the Safe Shutdown Earthquake (SSE) (i.e., seismic Category IIA).

The liner leakage detection system piping, the FPCC system piping, and the wave suppression scupper piping are all seismic Category IIA. The only other piping attached to, or in the SFP, is from the Residual Heat Removal (RHR) and Emergency Service Water (ESW) systems which provide a backup scurce of water for SFP cooling and makeup. This piping is seismic Category I.

Loss of any of the seismic Category IIA piping would not affect the ability to maintain spent fuel cooling or to maintain adequate submergence of the fuel. Accidental dropping of movable heavy objects into the SFP is precluded by the use of administrative procedures, electrical interlocks to limit the load travel over the spent fuel pool, and the use of guardrails and curbs around the pool and the reactor well to prevent fuel handling and servicing equipment from falling into the pool. The electrical interlocks and administrative procedures are described in Section 9.1.4 of the LGS UFSAR. In addition, heavy load handling in the vicinity of the SFP is conducted in accordance with the guidance delineated in NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," such that the likelihood of a heavy load drop is precluded.

<u>Existing Fuel Storage Racks</u>

Currently, the Unit 1 SFP can contain up to 23 high density spent fuel storage racks. The maximum analyzed fuel storage capacity for the SFP is 2862 fuel assemblies with a presently licensed capacity of 2040 fuel assemblies. The spent fuel storage racks are modular, freestanding, top entry racks designed to maintain the spent and new fuel in a space geometry whereby each fuel assembly has a neutron poisoning material between it and any adjoining fuel assemblies. This precludes the possibility of criticality under normal and abnormal conditions. LGS TS Section 5.5.1.1, "Criticality," requires that K_{eff} be maintained less than or equal to 0.95 in the SFP. The existing criticality analysis which supports the storage of 2862 spent fuel assemblies yielded a K_{eff} of 0.933. The only point of contact between the spent fuel rack and the SFP structure is with the bottom liner plate. The existing spent fuel rack modules consist of six (6) basic structural components: top grid casting, bottom grid casting, poison cans, side plates, corner angle clips, and adjustable foot assemblies. The top and bottom cast aluminum grids sandwich the square cross-section poison cans into pockets in a checkerboard arrangement. The design of the existing SFP storage racks is described in Section 9.1 of the LGS UFSAR. The grids are held in place by aluminum side plates and corner angles bolted and riveted with aluminum bolts and rivets. The rack modules are individually leveled with adjustable foot assemblies at the four (4) corners of the bottom grid. The adjustable foot assemblies consist of a 304 stainless steel bearing plate, a volumetrically captured 1/4-inch thick ABS plastic insulator, and an aluminum threaded section for height adjustment. The insulator provides protection from galvanic corrosion between the stainless steel and aluminum surfaces. All aluminum components are anodized individually.

There are three (3) sizes of rack modules in use at LGS (i.e., 10 feet x 11 feet, 10 feet x 12 feet, and 11 feet x 12 feet). The 10x11 modules have 55 poison cans, the 10x12 modules have 60 poison cans, and the 11x12 modules have 66 poison cans.

The poison cans consist of two (2) concentric square aluminum tubes, with four (4) plates of Boral (i.e., Boron carbide in an aluminum composite matrix) in the annular gaps. The Boral is so positioned that it overlaps the fuel pellet stack length in the fuel assemblies by one (1) inch at the top and bottom. The outer concentric tube is folded into the inner tube at both ends and totally seal-welded. Each poison can is pressure and vacuum leak tested and then plug-welded to isolate the Boral from the pool water. The poison cans are then anodized. The poison cans are not vented.

The top and bottom grid castings hold the fuel assemblies in a vertical position. The weight of the assemblies is supported by the lower grid casting and it, in turn, is supported by the four (4) adjustable foot assemblies that allow adjustment for variations in SFP floor level. To maintain a flat, uniform contact area, the leveling screw bearing pads are free to pivot. Each hole in a casting has adequate clearance for inserting or withdrawing a fuel assembly, either channeled or unchanneled. Sufficient guidance is provided to preclude damage to the fuel assemblies. The nominal center-to-center spacing between fuel assemblies in a module is 6.625 inches. The nominal center-to-center spacing between fuel assemblies in adjacent modules is 9.375 inches.

The spent fuel storage racks are installed in the SFP in such a manner as to ensure that there is a Boral plate between each adjoining fuel storage position. Each storage module is level with each other module at the top. There are 7.25 inches of clearance from the bottom of the module to the SFP floor. This ensures adequate clearance for cooling water to enter each fuel cell and, through natural convection, keep each fuel assembly cool.

The rack materials have no significant degradation due to the total radiation doses expected in the SFP over the design life. The racks are designed to withstand various loading conditions such as dead and live loads; loads experienced by a jammed fuel assembly or dropped fuel assembly; and loads experienced during seismic events (e.g., Operating Basis Earthquake).

Fuel Pool Cooling and Cleanup

The Fuel Pool Cooling and Cleanup (FPCC) system is designed to remove the decay heat generated by the spent fuel assemblies stored in the SFP and to maintain the pool water at a clarity and purity suitable both for underwater operations and for the protection of personnel in the refueling area. The FPCC system consists primarily of the pool water collection equipment, including wave suppression scupper and skimmer surge tanks, a cooling train with two (2) heat exchangers, two (2) pumps, a cleanup loop, and the discharge diffusers in the SFP. A backup heat exchanger and a backup pump are also included in the system. The FPCC system has no function related to the safe shutdown of the plant.

The FPCC system piping is designed so that operator error or a loss of piping integrity cannot result in the draining of the SFP so that stored fuel would be uncovered, and provides a source of makeup water to ensure the maintenance of the SFP water level. All piping and components of the FPCC system that form part of the flow path for makeup water from the Emergency Service Water (ESW) system, Residual Heat Removal Service Water (RHRSW) system, and the cooling water to and from the Residual Heat Removal (RHR) system are designed to remain functional following a Safe Shutdown Earthquake (SSE) event. The FPCC system is designed to maintain the bulk water temperature in the

SFP at or below 140°F under normal operating conditions, with a normal decay heat load of 1.632×10^7 Btu/hr, with two (2) FPCC pumps and two (2) FPCC heat exchangers in operation. This is based on the normal heat load discharge history as described in Section 9.1 of the LGS UFSAR. An evaluation was performed assuming the actual discharge schedules for the proposed storage of the 2500 spent fuel assemblies in the Unit 1 SFP. As result of this evaluation, the decay heat load was determined to be 1.05×10^7 BTU/hr, which is well below that of the currently analyzed condition. The FPCC system is designed to permit the RHR system to be used, through a cross-tie, to maintain the bulk water temperature in the SFP at or below 140°F, with a maximum anticipated decay heat load of 3.64×10^7 Btu/hr.

The existing thermal hydraulic analysis for the Unit 1 SFP is based on the storage of 2862 spent fuel assemblies. As documented in Section 9.1.3, "Spent Fuel Pool Cooling and Cleanup System," of Supplement 2 of the NRC's Safety Evaluation Report, i.e., NUREG-0991, "Safety Evaluation Report Related to the Operation of Limerick Generating Station, Units 1 and 2," the NRC indicated that based on its independent analysis the heat removal capability of the FPCC system could only support the storage of 2484 spent fuel assemblies. Increasing the spent fuel storage capacity in the Unit 1 SFP from 2040 fuel assemblies to 2500 fuel assemblies, as proposed in this TS Change Request, will facilitate storing 1940 spent fuel assemblies (including contingency) discharged from LGS, Units 1 and 2, and 560 low exposure fuel assemblies shipped to LGS from the Shoreham Nuclear Power Station. A vast majority of the spent fuel currently stored had been discharged after no more than three (3) full power operating cycles at LGS. An evaluation of the fuel recently discharged from LGS Unit 1 during the fifth refueling outage, which was completed in March 1994, indicates that the present decay heat generation rate is approximately 6400 W/bundle. In comparison, the decay heat generation rate for Shoreham fuel equates to approximately 0.47 W/bundle, or a total of 265 W for all 560 fuel assemblies. The heat load to the Unit 1 SFP from all the Shoreham fuel is insignificant, since it equates to approximately 5% of the heat load associated with one (1) recently discharged full power bundle. Although this proposed TS change requests an increase in the Unit 1 spent fuel storage capacity from 2040 fuel assemblies to 2500 fuel assemblies, the heat load to the Unit 1 SFP is equal to that of the 1940 fuel assemblies discharged from LGS, Units 1 and 2, which is less than the limit currently specified in the TS (i.e., 2040 fuel assemblies).

Water from the SFP flows through weirs and a wave suppression scupper at the pool surface into two (2) skimmer surge tanks adjacent to the pool. Water in the skimmer surge tanks flows by gravity through the fuel pool heat exchangers to the suctions of the fuel pool cooling pumps. From the pumps, water is returned to the SFP through two (2) diffusers located at the bottom of the pool. A portion of the discharge flow from the pumps can be diverted through the cleanup loop before being returned to the pool. Heat is removed from the fuel pool heat exchangers by the Service Water (SW) system.

During normal plant operation, the FPCC system serves only the SFP. However, during refueling operations, when the reactor well, dryer/separator pool, and/or cask loading pit are filled with water, the FPCC system can be aligned to recirculate and process the water in all these cavities. Water from the refueling water storage tank is used to fill the refueling area cavities. The refueling water pumps fill the cask loading pit through its drain line and fill the reactor well and the dryer/separator pool through diffusers in the reactor well. After refueling activities are completed, the refueling water pumps transfer water from the refueling area cavities back to the refueling water storage tank through a condensate filter/demineralizer if additional cleanup is required. Gravity draining of the refueling water directly to the refueling water storage tank is also possible.

As the heat load in the SFP changes, the number of operating fuel pool cooling pumps and heat exchangers is adjusted to maintain the desired water temperature. The FPCC system has sufficient cooling capacity to maintain the SFP water at a temperature at or below 140°F, with a normal decay heat load of 1.632×10^7 Btu/hr, with two (2) pumps and two (2) heat exchangers operating.

If an abnormally large heat load is placed in the SFP, a cooling train of the RHR system, consisting of an RHR pump and heat exchanger, can be substituted for the FPCC pumps and heat exchangers for cooling the SFP water. A cross-connection between the drain line from the skimmer surge tanks and the RHR system allows one (1) RHR pump to take suction from the skimmer surge tanks and pump SFP water through an RHR heat exchanger before returning it to the SFP via diffusers at the bottom of the SFP provided specifically for use with the RHR system. Interconnecting piping between the RHR system and FPCC system is accomplished by use of a spool piece (i.e., one (1) blind flange for normal operations or one (1) open spool for when the intertie is required). Administrative controls prevent the use of the RHR system intertie unless the associated reactor is shut down and is in the refueling mode.

The RHR system alone is capable of cooling the SFP water under the conditions when a full core of irradiated fuel is offloaded into the SFP. The RHR system has sufficient heat removal capacity to maintain the SFP water at a temperature at or below 140°F, with a maximum anticipated decay heat load of 3.64×10^7 Btu/hr. The RHR system may also be used for cooling in the event the FPCC system is unavailable.

If normal fuel pool cooling should be lost as a result of a pipe break in the seismic Category IIA portion of the system, the quantity of water released would be limited to the inventory in the SFP above the overflow weirs, the skimmer surge tanks, and the pump suction piping. The flood height and environmental conditions resulting from this break would not prevent personnel from making the necessary RHR system crosstie connection which requires manual action to establish. The maximum temperature (i.e., 150°F) and pressure (i.e., 31 psig) of the water in the line are not high enough to significantly affect the temperature, pressure, or humidity conditions in the area where the crosstie is made. The released fluid would not be highly radioactive. The maximum flood height in the area resulting from this break is conservatively calculated to be about one (1) foot. However, if the floor drains in the area are functioning, the flood water height would be much lower, and the water would drain out of the room at approximately the same rate as it flowed in from the break.

If there is a Loss of Offsite Power (LOOP), the Class 1E buses are powered by the emergency diesel generators (EDGs), and the two (2) FPCC pumps that receive Class 1E power can be restarted. Since normal SW is not available in this case, the FPCC heat exchangers can be cooled by the Reactor Enclosure Cooling Water (RECW) system, which is cooled by the ESW system, by interconnecting piping, after installation of normally removed spool pieces. However, other cooling methods would also be available as described below.

If there is a complete loss of capability to remove heat from the SFP using heat exchangers, heat can be removed by allowing the pool to boil and adding makeup water to maintain the SFP water level. Makeup water is normally supplied to the skimmer surge tanks from the demineralizer water makeup system by manipulating a remote manually operated valve. If makeup water from this source is not available, makeup can be provided from the ultimate heat sink (i.e., Spray Pond) by one (1) of two (2) flow paths. The first of these backup makeup sources is a loop of the ESW system via a cross-connecting line to one

(1) of the RHR system diffusers in the SFP. The two (2) ESW pumps in the ESW loop provide redundancy in motive power for this source of makeup supply. The manual valves that must be opened to initiate makeup from the ESW system are located in the control structure and are accessible after an accident that would render the reactor and refueling secondary containments inaccessible. The second of these backup makeup sources is a loop of the RHRSW system via the piping of one (1) RHR system loop and the cross-connecting piping leading to the RHR diffusers in the SFP. The two (2) RHRSW pumps in the RHRSW loop provide redundancy in motive power for this source of makeup supply. These backup sources of makeup water provide substantial flow rates to ensure adequate makeup capability. The Spray Pond is designed with sufficient water volume in order to provide a source of makeup water for the SFP for 30 days, without makeup to the pond during which time the cooling function of the FPCC system or RHR system can be established or an alternate makeup water supply can be established.

As described above, the SFP is provided with redundant seismic Category I makeup capability to ensure an adequate supply of makeup water to the SFP under conditions of maximum anticipated evaporation associated with fuel pool boiling. The radiological consequences of a boiling SFP are discussed in Section 9.1.3.6 of the LGS UFSAR. Makeup water to the SFP is supplied from the Spray Pond using either the ESW system or RHRSW system. Redundant pumps, capable of being powered by the associated EDGs, in each loop of the ESW and RHRSW systems provide assurance of the availability of motive power for pumping the makeup water.

<u>Information Supporting a Finding of No Significant Hazards Consideration</u>

We have concluded that the proposed change to the Limerick Generating Station (LGS) Unit 1 Technical Specifications (TS) to permit an interim increase in the spent fuel storage capacity from 2040 fuel assemblies to 2500 fuel assemblies in the Unit 1 Spent Fuel Pool (SFP) does 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. <u>The proposed Technical Specifications (TS) change does not involve a significant increase in the probability or consequences of an accident previously evaluated</u>.

   Increasing the spent fuel storage capacity in the Unit 1 Spent Fuel Pool (SFP) from 2040 fuel assemblies to 2500 fuel assemblies does not increase the probability of occurrence of an accident. Since all fuel handling activities will be performed using approved procedures and compatible equipment, the probability of a fuel handling accident occurring is unchanged.

   Increasing the spent fuel storage capacity in the Unit 1 SFP to 2500 fuel assemblies will facilitate storing 1940 spent fuel assemblies (including contingency) that have been discharged from LGS, Units 1 and 2, and 560 low exposure fuel assemblies shipped to LGS from the Shoreham Nuclear Power Station. The decay heat load associated with the entire Shoreham fuel inventory is insignificant, since it equates to less than 5% of the heat load generated from one (1) recently discharged full power fuel bundle. Therefore, the actual decay heat load to the Unit 1 SFP will be equivalent to that which is generated from storing the 1940 spent fuel assemblies discharged from LGS, Units 1 and 2.

Increasing the spent fuel storage capacity in the Unit 1 SFP to accommodate the storage of 2500 fuel assemblies, as proposed in this TS Change Request, is bounded by the existing analysis supporting the storage of spent fuel at LGS. The existing analysis considers design inputs for structural integrity, criticality, and thermal-hydraulics and is based on the storage of 2862 spent fuel assemblies. As documented in Section 9.1.3, "Spent Fuel Pool Cooling and Cleanup System," of Supplement 2 of the NRC's Safety Evaluation Report, i.e., NUREG-0991, "Safety Evaluation Report Related to the Operation of Limerick Generating Station, Units 1 and 2," the NRC indicated that based on its independent analysis the heat removal capability of the Fuel Pool Cooling and Cleanup (FPCC) system could only support storing 2484 spent fuel assemblies. However, the LGS Unit 1 TS currently limit the storage of spent fuel to 2040 spent fuel assemblies. Since the decay heat load from the Shoreham fuel inventory (i.e., 560 fuel assemblies) is insignificant, the actual heat load to the Unit 1 SFP will be equivalent to that generated from 1940 fuel assemblies discharged from LGS, Units 1 and 2, which is less than the limit currently specified the TS (i.e., 2040 fuel assemblies).

Relocating six (6) of the existing Unit 2 spent fuel storage racks to the Unit 1 SFP will be conducted in accordance with PECO Energy's Heavy Loads Program which was developed in order to implement the guidance delineated in NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," such that the likelihood of a heavy load drop is precluded. The Unit 2 spent fuel storage racks are identical to those already in use in the Unit 1 SFP. Procedures will be in place to ensure that the Unit 2 spent fuel storage racks are situated in the Unit 1 SFP to insure proper neutron poison alignment with the existing Unit 1 racks. The existing spent fuel storage racks are designed for rack-to-rack contact during design basis events without the loss of structural integrity. The racks are also designed to withstand the impact from a dropped fuel assembly without the loss of structural integrity or be damaged in a way that could adversely affect the criticality analysis. Increasing the spent fuel storage capacity to accommodate the storage of 2500 spent fuel assemblies will not affect the spent fuel storage racks since the racks are specifically designed to safely store spent fuel.

This proposed TS change will not prevent the ability of the FPCC system from performing its design function to adequately cool the SFP. The FPCC system will continue to function normally and be capable of maintaining the SFP temperature at or below 140°F. The backup cooling and makeup systems (i.e., Residual Heat Removal (RHR), Emergency Service Water (ESW), and Residual Heat Removal Service Water (RHRSW) systems) will continue to function as designed to provide an alternate source of cooling and makeup water to ensure SFP cooling is maintained. The RHR system is still capable of maintaining the SFP temperature less than 140°F as described in LGS Updated Final Safety Analysis Report (UFSAR). Increasing the spent fuel storage capacity in the Unit 1 SFP will not increase the probability of a loss of fuel pool cooling accident or adversely affect the Refuel Floor ventilation system.

The consequences of a Fuel Handling Accident as described in the LGS UFSAR are not increased since the number of fuel assemblies stored in a SFP is not an input to the initial conditions of the accident evaluation. This accident evaluates the dropping of a spent fuel assembly and the fuel grapple assembly into the reactor core during refueling operations. A drop height of 32 feet for the spent fuel assembly and 47 feet for the fuel grapple assembly are assumed and will produce the largest number of failed fuel rods. Since the maximum possible height a fuel assembly can be dropped over the SFP does not exceed 32 feet, the consequences of a Fuel Handling Accident will not be increased by increasing the number of fuel storage cells.

The consequences of a loss of fuel pool cooling as described in Section 9.1.3.6 of the LGS UFSAR will not be increased. The event described in the UFSAR assumes that the iodine in the fuel from past refuelings is negligible, due to the long decay time. Iodine is the major contributor to thyroid dose. Since the iodine in the fuel from past refuelings is negligible, due to the long decay time, increasing the spent fuel storage capacity will not increase the dose due to the release of iodine in the SFP water resulting from boiling and therefore, the consequences are not increased.

Increasing the storage capacity in the Unit 1 SFP, on an interim basis, will not increase the probability of a malfunction of the stored spent fuel since the existing thermal-hydraulic analysis confirms that sufficient cooling capability exists to accommodate the storage of 2500 fuel assemblies in the Unit 1 SFP. As for fuel criticality, the existing analysis also confirms that the stored fuel assemblies will remain sub-critical under normal and abnormal conditions.

Increasing the storage capacity in the Unit 1 SFP will not increase the probability of a malfunction of the SFP structure or SFP liner. The existing structural analysis confirms that the SFP structure has adequate margin to prevent overstressing and meets the code requirements. Increasing the storage capacity in the Unit 1 SFP will not increase the probability of a malfunction of the spent fuel storage racks during design basis events based on the existing seismic/structural analysis.

Increasing the on-site spent fuel storage capacity will not increase the probability of a malfunction of the FPCC system. The FPCC system will continue to function as designed.

The probability of a malfunction of fuel handling equipment will not be increased since increasing the storage capacity in the Unit 1 SFP, as proposed, does not affect fuel handling equipment.

Increasing the spent fuel storage capacity does not increase the consequences of a spent fuel assembly failure since the failure of one (1) assembly will not result in additional spent fuel assembly failures.

Increasing the spent fuel storage capacity will not increase the consequences of spent fuel storage rack failure, since the existing racks have been designed/qualified to limit the consequences of a failure. A failure of, or damage to one (1) storage rack, will not result in failure or damage to another storage rack.

Increasing the spent fuel storage capacity will not increase the consequences of the failure of fuel handling equipment since the maximum expected number of fuel rods damaged by a fuel handling equipment failure remains as evaluated in the LGS UFSAR.

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

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

Increasing the spent fuel storage capacity in the LGS Unit 1 SFP to permit an interim increase from 2040 fuel assemblies to 2500 fuel assemblies will not create the possibility of an accident of a different type. The Unit 1 SFP has been analyzed for criticality effects, structural effects, radiological effects, and thermal-hydraulic effects. The increase in spent fuel storage capacity will be achieved by relocating six (6) existing spent fuel storage racks from the Unit 2 SFP to the Unit 1 SFP. The spent fuel storage racks are of identical design and are passive components; therefore, the possibility of creating a new accident does not exist.

No new operating schemes or active equipment types will be required to store additional fuel bundles in the SFP. Therefore, the possibility of a different type of malfunction occurring is not created.

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

3. <u>The proposed TS change does not involve a significant reduction in a margin of safety.</u>

Since the existing TS limits for fuel handling interlocks, heavy loads restrictions, water coverage over irradiated fuel, in-core decay time, and fuel sub-criticality will be maintained, the margin of safety will not be reduced.

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

<u>Information Supporting an Environmental Assessment</u>

An Environmental Assessment is not required for the change proposed by this Change Request, since the requested change to the Limerick Generating Station (LGS) Unit 1 TS conforms to the criteria for "actions eligible for categorical exclusion," as specified in 10 CFR 51.22(c)(9). The requested change will have no impact on the environment.

The LGS, Units 1 and 2, TS currently limit the storage capacity in the Spent Fuel Pools (SFPs) to 2040 fuel assemblies. Allowing for an interim increase in the Unit 1 SFP spent fuel storage capacity from 2040 fuel assemblies to 2500 fuel assemblies will facilitate implementation of a modification to install new high density spent fuel storage racks for storing 4117 spent fuel assemblies in both SFPs at LGS. A separate TS Change Request (i.e., 93-19-0) was submitted by letter dated January 14, 1994, to support the proposed change to install the high density spent fuel storage racks to increase storage capacity to 4117 fuel assemblies.

The SFP reracking operation is scheduled to be begin on Unit 2 first. In order to implement this modification all of the existing Unit 2 spent fuel will be transferred to the Unit 1 SFP on interim basis. Increasing the storage capacity in the Unit 1 SFP from 2040 fuel assemblies to 2500 fuel assemblies will provide adequate storage space to store all of the existing Unit 1 and Unit 2 spent fuel (i.e., 1940 fuel assemblies, including contingency), along with the fuel being transferred from the Shoreham Nuclear Power Station to LGS (i.e., 560 fuel assemblies). The NRC previously approved the transfer of the Shoreham fuel to LGS by letter dated June 23, 1993. To provide for the additional storage capacity in the Unit 1 SFP, six (6) existing spent fuel storage racks will be relocated from the Unit 2 SFP to the Unit 1 SFP. The Unit 2 spent fuel will then be transferred to the Unit 1 SFP which will enable the reracking modification work on Unit 2 to be performed with no spent fuel in the SFP. The work activities associated with moving the spent fuel storage racks and spent fuel will be accomplished by keeping radiation exposure as low as reasonably achievable (ALARA). Shielding from the spent fuel assemblies will be assured by maintaining the water level in the SFP at or above the required minimum water level.

Increasing the spent fuel storage capacity for the Unit 1 SFP, as proposed, will not result in an increase in the total amount of spent fuel currently permitted to be stored onsite at LGS. The existing TS requirements limit the spent fuel pool storage capacity per unit to 2040 fuel assemblies. Therefore, the total permitted onsite storage capacity is 4080 spent fuel assemblies. This proposed change is bounded by the existing analysis, since all of the spent fuel currently onsite will be temporarily stored in the Unit 1 SFP, and will not exceed 2500 fuel assemblies.

The proposed change does not involve a significant hazards consideration as discussed in the preceding section. The proposed change does not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed change does not involve a significant increase in the individual or cumulative occupational radiation exposure.

Conclusion

The Plant Operations Review Committee and the Nuclear Review Board have reviewed this proposed change to the LGS Unit 1 TS and have concluded that it does not involve an unreviewed safety question, and will not endanger the health and safety of the public.

ATTACHMENT 2

LIMERICK GENERATING STATION

UNIT 1

Docket No. 50-352

License No. NPF-39

TECHNICAL SPECIFICATIONS CHANGE REQUEST

No. 94-20-1

LIST OF AFFECTED PAGES

<u>UNIT 1</u>

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