



PECO NUCLEAR

A Unit of PECO Energy

Station Support Department

10CFR70.24(d)
10CFR70.14

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

December 23 1997

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
10CFR70.24 Exemption Request

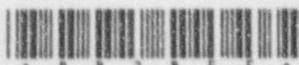
Dear NRC Officials:

This letter is being submitted to request an exemption from the requirements of 10CFR70.24(a), "Criticality Accident Requirements," for Limerick Generating Station (LGS), Unit 1. The basis for this request, is similar to the justification provided for the exemption to 10CFR70.24 that was granted by the NRC as documented in Materials License SNM-1926 issued on April 3, 1984, in support of construction activities at LGS, Unit 1. This letter is therefore requesting that the applicable parts of the previously granted exemption to 10CFR70.24 be reapproved. It is PECO Energy's understanding that the NRC has taken the position that, unless an exemption granted under a 10CFR70 license is explicitly incorporated into the subsequently issued 10CFR50 operating license, the exemption expires upon issuance of the 10CFR50 operating license. This position is supported as indicated in SECY-97-155, "Staff's Actions Regarding Exemptions from 10CFR70.24 for Commercial Nuclear Power Plants," and recently issued Information Notice (INN) 97-77, "Exemptions from the Requirements of Section 70.24 of Title 10 of the Code of Federal Regulations." INN 97-77 recommends that licensees obtain an exemption from this regulation before the next receipt of fresh fuel or before the planned movement of fresh fuel.

Therefore, PECO Energy is requesting an exemption to the criticality accident monitoring requirements stipulated in 10CFR70.24(a) specifically for the areas containing incore detectors (which are not in use) and unirradiated fuel while it is handled, used, or stored onsite. We are requesting that the NRC grant this exemption by January 31, 1998, in order to support receipt of new fuel at LGS, Unit 1, which is scheduled for the first week of February, 1998. A similar exemption to the requirements of 10CFR70.24 is not required for LGS, Unit 2, since one was previously granted as stated in the LGS, Unit 2, Facility Operating License (NPF-85) under License Condition 2.D.

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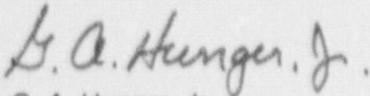


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PECO Energy believes that we have satisfied the good cause requirements described in 10CFR70.24(d). The attached exemption request provides the necessary justification in support of our request. We further believe that the requested exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest.

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

Attachment

cc: H. J. Miller, Administrator, USNRC, Region I (w/ attachment)
A. L. Burritt, USNRC Senior Resident Inspector, LGS

ATTACHMENT

Limerick Generating Station
Unit 1

10CFR70.24 Exemption Request and Justification

**Limerick Generating Station
Unit 1
10CFR70.24 Exemption Request and Justification**

Request for Exemption from 10CFR70.24(a) Requirements

In accordance with the requirements of 10CFR70.14, PECO Energy requests an exemption from the criticality accident monitoring requirements of 10CFR70.24(a) for Limerick Generating Station (LGS), Unit 1, as it applies to Special Nuclear Material (SNM) in the form of not in use in-core nuclear instrumentation, e.g., source range monitors (SRMs), intermediate range monitors (IRMs), local power range monitors (LPRMs), and traversing in-core probes (TIPs).

An exemption from the criticality accident monitoring requirements of 10CFR70.24(a) is also requested for areas where unirradiated fuel is processed. New fuel bundles, which are packaged in NRC approved packaging, may be handled, used, or stored in unmonitored areas provided they remain in the approved shipping packages. Radiation monitoring instrumentation (i.e., using gamma- or neutron-sensitive radiation detectors) will be provided in those areas where the fuel assemblies are removed from the shipping containers. This will therefore ensure that the new fuel is monitored in all areas where it is handled, used, or stored.

This exemption is necessary to clarify the requirements stipulated in the LGS, Unit 1, Facility Operating License (NPF-39), which in general invokes 10CFR70 as a whole. This request is also consistent with recently issued NRC guidance with regard to criticality accident monitoring requirements. Information Notice (INN) 97-77, "Exemptions from the Requirements of Section 70.24 of Title 10 of the Code of Federal Regulations," recommends that licensees obtain an exemption from this regulation before the next receipt of fresh fuel or before the planned movement of fresh fuel. The NRC further indicated that it would not pursue any further enforcement actions provided licensees obtained the necessary exemption, if warranted.

Granting this exemption will facilitate receipt and processing of new fuel for LGS, Unit 1, currently scheduled for the first week of February, 1998. Therefore, we are requesting that the NRC grant this exemption by January 31, 1998, in support of this schedule. The requested exemptions specified above will in no way affect the health and safety of the public. A similar exemption to the requirements of 10CFR70.24 is not required for LGS, Unit 2, since one was previously granted as documented in the LGS, Unit 2, Facility Operating License (NPF-85) under License Condition 2.D.

Good Cause Justification

Section 70.24(d) anticipates that licensees may request relief from these requirements and allows licensees to apply for an exemption from Section 70.24, in whole or in part, if good cause is shown. PECO Energy believes that good cause exists as discussed below.

Scope of Request

10CFR70.24(a), "Criticality Accident Requirements," states the following:

"Each licensee authorized to possess special nuclear material in a quantity exceeding 700 grams of contained uranium-235, 520 grams of uranium-233, 450 grams of plutonium, 1500 grams of contained uranium-235 if no uranium enriched to more than 4 percent by weight of uranium-235 is present, 450 grams of any combination thereof, or one-half such quantities if massive moderators or reflectors made of graphite, heavy water or beryllium may be present, shall maintain in each area in which such licensed special nuclear material is handled, used, or stored, a monitoring system meeting the requirements of either paragraph (a)(1) or (a)(2), as appropriate, and using gamma- or neutron-sensitive radiation detectors which will energize clearly audible alarm signals if accidental criticality occurs. This section is not intended to require underwater monitoring when special nuclear material is handled or stored beneath water shielding or to require monitoring systems when special nuclear material is being transported when packaged in accordance with the requirements of part 71 of this chapter."

Incore Detectors

The major form of special nuclear material (SNM) that is present at LGS, Unit 1, is principally in the form of nuclear fuel. However, there are other quantities of SNM that are used, or may be handled, used, or stored, at LGS, Unit 1. This material is in the form of fissile material incorporated into nuclear instrumentation (e.g., SRMs, IRMs, LPRMs, and TIPs). The amount of SNM contained in the nuclear instrumentation is small and significantly less than the quantities delineated in Section 70.24(a). The small quantity of SNM present in the nuclear instrumentation and the form in which the SNM is maintained (i.e., a very thin coating applied on the inside of the sealed fission chamber contained at the end of each monitor), precludes inadvertent criticality.

The total amount of SNM contained in the incore detectors is such that it also meets the "forms not sufficient to form a critical mass" guidance in Section 1.1 of Regulatory Guide (RG) 10.3, "Guide for the Preparation of Applications for Special Nuclear Material Licenses of Less than Critical Mass Quantities." The quantities of SNM specified to be enough for critical mass in RG 10.3 are 350 grams of uranium-235 (U-235), 200 grams of uranium-233 (U-233), and 200 grams of plutonium-239 (Pu-239).

Currently, the quantity of SNM in the form of incore detectors at LGS, Unit 1 is well below the amounts for which criticality monitoring would be required as described in 10CFR70.24(a). If this was the only type of SNM stored onsite, criticality monitoring would not be required. Since the form of SNM on the incore detectors is such that an inadvertent criticality cannot occur, PECO Energy believes that we have demonstrated good cause for granting an exemption to the criticality accident monitoring requirements stipulated in 10CFR70.24(d).

Unirradiated Nuclear Fuel

Unirradiated nuclear fuel packaged in an NRC approved packaging is prevented from criticality events due to the construction of the package and the storage configuration of the fuel in the shipping container. Package design ensures that a criticality safe configuration is maintained during transport, handling, storage, and accident conditions. Package design also precludes introduction of any moderating agents due to leak tight construction. NRC approval (i.e., represented by issuance of a Certificate of Compliance

for Radioactive Materials Packages) of the package design is certification by the NRC that any incident which could occur during transport could not cause an inadvertent criticality accident. The fuel that is received at LGS, Units 1 and 2, is packaged in NRC approved shipping packages which satisfy the requirements of 10CFR71. The approved shipping packages that are received consist of an outer wooden container and an inner metal container. Since PECO Energy only removes the new fuel from the inner shipping container in areas where criticality accident monitoring is present (i.e., the Refuel Floor), we believe that we have demonstrated good cause for granting an exemption to the criticality accident monitoring requirements stipulated in 10CFR70.24(d).

Criteria for Evaluating 70.24 Exemption Requests

As indicated in SECY-97-155, dated July 21, 1997, the NRC determined that it is appropriate to exercise enforcement discretion in some cases where licensees do not comply with the 10CFR70.24 requirements, since the safety significance of the failure to comply with these requirements is minimal provided controls are in place to ensure compliance with General Design Criteria (GDC) 62. The NRC also indicated that enforcement discretion was appropriate because it did not recognize the need for an exemption during the licensing process. The NRC does not intend to take further enforcement action for failure to meet the requirements of 10CFR70.24 provided licensees obtain an exemption from this regulation before the next receipt of fresh fuel or before the next planned movement of fresh fuel. The NRC established and published seven (7) criteria that it is using to evaluate exemption requests to 10CFR70.24. This position, along with the seven (7) review criteria, was reiterated in Ltr 97-77 issued on October 10, 1997. To assist the NRC in its review of PECO Energy's 10CFR70.24 exemption request, the criteria is restated below followed by our response.

Criterion 1. *Plant procedures do not permit more than [1 PWR or 3 BWR] new fuel [assembly/assemblies] to be in transit between their associated shipping cask and dry storage rack at one time.*

Response

Existing plant procedures (i.e., M-97-044) restrict the number of fresh fuel assemblies that are permitted to be out of their shipping boxes on the fuel floor to two (2). The fuel inspection and channeling stand used at the LGS facility can only accommodate two bundles at a time. After the bundles are inspected and channeled, they are immediately placed in the spent fuel pool. Therefore, PECO Energy believes that we have satisfied this specific criterion.

Criterion 2. *The k-effectiveness of the fresh fuel storage racks filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water does not exceed 0.95, at a 95 percent probability, 95 percent confidence level.*

Response

This criterion is not applicable at LGS, Unit 1, since there are no fresh fuel storage racks on the LGS, Unit 1, fuel floor (or anywhere else in the receipt process). They were never used during fresh fuel receipt and were subsequently dismantled. The fresh fuel storage vault is now used for general purpose storage. Therefore, PECO Energy believes that we have satisfied this specific criterion.

Criterion 3. *If optimum moderation of fuel in the fresh fuel storage racks occurs when the fresh fuel storage racks are not flooded, the k-effective corresponding to this optimum moderation does not exceed 0.98, at a 95 percent probability, 95 percent confidence level.*

Response

This criterion is not applicable to LGS, Unit 1, for the same reason as stated in response to Criteria 2 above. There are no fresh fuel storage racks in use at LGS, Unit 1. Therefore, PECO Energy believes that we have satisfied this specific criterion.

Criterion 4. *The k-effective of spent fuel storage racks filled with fuel of the maximum permissible U-235 enrichment and filled with pure water does not exceed 0.95, at a 95 percent probability, 95 percent confidence level.*

Response

The LGS, Unit 1, Technical Specifications (TS) Section 5.5.1.1(a) specifically states with respect to the design of the spent fuel storage racks that: "A k_{eff} equivalent to less than or equal to 0.95 when flooded with unborated water, including all calculational uncertainties and biases as described in Section 9.1.2 of the FSAR." Therefore, PECO Energy believes that we have satisfied this specific criterion since it is included in the current licensing basis. In addition, existing plant fuel bundle design procedures require a fuel storage reactivity analysis, which utilizes the above criterion, for all new fuel designs to ensure that the plant licensing basis is maintained.

Criterion 5. *The quantity of forms of special nuclear material, other than nuclear fuel, that are stored on site in any given area is less than the quantity necessary for a critical mass.*

Response

LGS, Unit 1 has a SNM Accountability and Control Program (i.e., procedures A-44 and RE-C-044) which ensures that fuel and non-fuel SNM is properly stored and accounted for in accordance with the requirements of 10CFR40 and 10CFR70. This Program establishes "Material Balance Areas" which are used to store and account for all SNM (fuel and non-fuel) material. Items that contain non-fuel SNM are typically SRMs, IRMs, LPRMs, and TIPs. These items have been evaluated and determined to contain much less enriched uranium by weight (i.e., < 1 gram) which would be required to achieve criticality in any configuration. Therefore, PECO Energy believes that we have satisfied this specific criterion.

Criterion 6. *Radiation monitors, as required by GDC 63, are provided in fuel storage and handling areas to detect excessive radiation levels and to initiate appropriate safety actions.*

Response

New fuel at the LGS facility is stored and handled in three (3) areas: 1) the refuel floor, 2) the in plant truck bay area, and 3) the yard areas. On the refuel floor and in the truck bay, there are installed plant area radiation monitors (ARMs) that provide audible alarms if excessive radiation levels are detected. The ARM setpoints on the refuel floor are set to alarm between 5 mR/hr and 18 mR/hr. The ARM setpoint in the truck bay is set to alarm at 100 mR/hr. The ARMs provide both a local and Main Control Room alarm.

In the outside yard area, local area radiation monitors will be installed in the yard area during the new fuel handling process. Alarm setpoints similar to the refuel floor ARMs will be established to provide audible local alarms if excessive radiation levels are encountered. Therefore, during the new fuel receipt process, fuel will be constantly monitored by an ARM which PECO Energy believes satisfies the conditions specified in this criterion.

Criterion 7. *The maximum nominal U-235 enrichment is 5 wt%.*

Response

PECO Energy's nuclear fuel supplier is licensed to handle a maximum of 5 weight percent enrichment in their fuel fabrication facility. In addition, our enrichment supplier is only certified, and specified by contract, to enrich natural uranium to 5 weight percent. Therefore, PECO Energy does not use, or have access to, fuel with enrichments greater than 5 weight percent. Therefore, PECO Energy believes that we have satisfied this specific criterion.

Cost Benefit

A considerable amount of resources would be expended to install, maintain, and operate a criticality accident monitoring system at LGS, Unit 1, to satisfy the requirements of 10CFR70.24, without a comparable increase in plant safety. Therefore, installation of a monitoring system designed to meet these requirements does not appear justified or necessary.

Risk to Public Health and Safety

Due to the form of SNM contained in the incore detectors, and as long as the unirradiated fuel is stored in approved shipping containers, or as specified in the responses to the criteria identified above, an inadvertent criticality will not occur. Therefore, public health and safety considerations are maintained.

Environmental Assessment

Since all fuel handling activities at LGS are performed in accordance with approved procedures intended to assure non-criticality and radiation safety, environmental impacts from an inadvertent criticality are not expected. Therefore, granting this exemption will have no significant adverse impact on the quality of the environment.

Conclusion

Based on the above exemption request and supporting justification, PECO Energy has concluded that operation of LGS, Unit 1, in accordance with the proposed exemption to 10CFR70.24(a) is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. PECO Energy considers that good cause for granting an exemption has been demonstrated, and therefore, the requested exemption should be granted in accordance with the requirements of 10CFR70.24(d).
