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 AUTH. NAME AUTHOR AFFILIATION
 BYRAM, R.G. Pennsylvania Power & Light Co.
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Pennsylvania Power & Light Company

Two North Ninth Street • Allentown, PA 18101-1179 • 610/774-5151

Robert G. Byram
Senior Vice President-Nuclear
610/774-7502
Fax: 610/774-5019

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SUSQUEHANNA STEAM ELECTRIC STATION
30 DAY RESPONSE TO BULLETIN 96-02
"MOVEMENT OF HEAVY LOADS"
PLA-4460 **FILE R41-2**

Docket Nos. 50-387
and 50-388

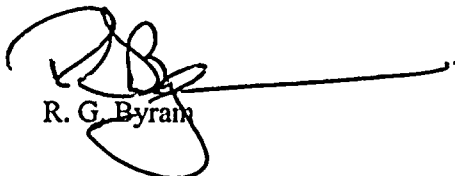
This letter provides Pennsylvania Power & Light (PP&L) Company's required 30-day response to Bulletin 96-02, "Movement of Heavy Loads Over Spent Fuel, Over Fuel in the Reactor Core, or Over Safety-Related Equipment." PP&L finds that our approach to the control of heavy loads, within the scope of Bulletin 96-02, is in accordance with applicable regulatory guidelines, and exceeds the NUREG 0612 Phase I requirements for refueling floor loads. PP&L's approach to heavy loads conformance is discussed in the attached report.

While PP&L is in conformance with NUREG 0612 Phase I, we have also committed to implement the voluntary NUREG 0612 Phase II guidance for reactor vessel disassembly/reassembly evolutions. We are currently reviewing aspects of our implementation of Phase II commitments. PP&L will implement any necessary corrective actions resulting from this review prior to the next scheduled reactor vessel disassembly.

PP&L is planning to begin moving spent fuel storage casks to an onsite repository in the latter half of 1997. We are currently reviewing the need for changes to the licensing basis, including Technical Specification changes, to support this activity. In the event that a license amendment is needed, PP&L will submit the appropriate request.

If you have any questions on PP&L's response to Bulletin 96-02, please contact Mr. Terence Bannon at (610) 774-4019.

Very truly yours,



R. G. Byram

Attachment

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TEL
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PDR ADOCK 05000387
Q PDR

copy: NRC Region I
Ms. M. Banerjee, NRC Sr. Resident Inspector
Mr. C. Poslusny, Jr., NRC Sr. Project Manager
Mr. W. P. Dornsife, PA DEP

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA)

: SS

COUNTY OF LEHIGH)

I, ROBERT G. BYRAM, being duly sworn according to law, state that I am Senior Vice President - Nuclear of Pennsylvania Power & Light Company and that the facts set forth on the attached Bulletin 96-02 response pursuant to 10CFR50.54(f) are true and correct to the best of my knowledge, information and belief.



Robert G. Byram
Senior Vice President - Nuclear

Sworn to and subscribed
before me this ^{3rd} day
of May, 1996.



Notary Public

Notarial Seal
Martha C. Sedora, Notary Public
Allentown, Lehigh County
My Commission Expires Jan. 15, 1998
Member, Pennsylvania Association of Notaries

**NRC BULLETIN 96-02
MOVEMENT OF HEAVY LOADS
REPORT ON PLANS & CAPABILITIES TO HANDLE HEAVY LOADS**

A review of the pertinent regulatory documentation, as well as the heavy loads correspondence between PP&L and the NRC, has been performed to address Item 1 in the Required Response section of NRC Bulletin 96-02 "Movement of Heavy Loads Over Spent Fuel, Over Fuel in the Reactor Core, or Over Safety- Related Equipment". The results of that review in conjunction with an examination of the licensing basis for Susquehanna SES are summarized in this report. The report finds that PP&L is in conformance with the requirements of NUREG 0612 Phase I.

NRC Bulletin 96-02 is particularly concerned with heavy load movements while the plant is operating. Because Susquehanna is a dual unit plant with common systems, a common refueling floor and a staggered approach to unit outages, all lifts performed during an outage on any unit could be considered as being made while the plant is operating. As a result, PP&L has provided a description of the Heavy Loads Program as it applies to the handling of heavy loads at SSES regardless of plant operating condition.

Bulletin 96-02 specifically identifies two examples of heavy loads (i.e. spent fuel dry storage casks and reactor cavity shield blocks) in its text. The movement of spent fuel dry storage casks is planned for the latter part of 1997. This lift will be performed with the units at power. A discussion of this heavy load activity and how it will satisfy the existing Heavy Loads Program is provided in a separate section of this report. Reactor cavity shield blocks are also moved with both units at power. Currently, the top layer of shield blocks is removed in preparation for a refueling outage during condition 2 and the bottom layer during condition 3. Reinstallation following the refueling outage is performed in the reverse order. The reactor cavity shield blocks are considered to be part of the reactor vessel assembly/disassembly activity. Our approach to handling the reactor vessel assembly/disassembly activity is discussed in this report.

The most important aspect of the SSES licensing basis regarding the heavy loads issue is identified in FSAR section 9.1.5. The Unit 1 Reactor Building Crane is single failure proof and is designed to handle the spent fuel cask as well as refueling and vessel service load requirements for Unit 1 or Unit 2. Susquehanna Unit 2 is equipped with a nearly identical, but non-single failure proof certified Reactor Building Crane. In addition, PP&L's commitments to the provisions of NUREG 0612 "Control of Heavy Loads at Nuclear Power Plants" have been documented and addressed in correspondences with the NRC. An example of specific reference to NUREG 0612 as a licensing basis commitment is included in FSAR section 9.1.4.3.5.

NUREG 0612 was originally intended for implementation via a two phase approach. Phase I requirements, which included seven general criteria for a defense-in-depth program, were primarily aimed at load handling practices and load drop prevention. The NRC accepted and

approved PP&L's NUREG 0612 program for Phase I via separate safety evaluation reports for Unit 1 and 2 (issued 7/21/83 and 10/31/83 respectively). Phase II requirements of NUREG 0612 were more stringent, lift specific, and intended to assure that the handling of heavy loads or the consequences of a load drop would not adversely affect nuclear safety. Simply stated, Phase II required either the use of single failure proof cranes and lifting devices or the postulation and analysis of heavy load drops.

Based on the favorable implemented actions of licensees during the Phase I effort, the NRC staff withdrew the requirement to complete Phase II (GL 85-11), however, encouraged licensees to implement any safety-significant actions they deemed appropriate. Since the majority of the heavy load movements in the plant at that time were associated with refueling outages, PP&L prudently chose to pursue the drop analysis approach of Phase II for heavy load lifts/transport associated with the Reactor Vessel assembly/disassembly activities. To demonstrate that the consequences of a load drop would not adversely affect nuclear safety, detailed drop analysis evaluations were performed by defining and considering safe load paths, lift height restrictions, and other lift specific requirements for the Reactor Vessel assembly/disassembly evolution. These extensive and detailed drop analysis evaluations led to the development of a series of safe load path and lift height restriction drawings. The lift restrictions and controls identified in this series of drawings have been procedurally implemented via plant procedures. The development and implementation of the load drop analysis provided PP&L with an alternative to relying on the use of a single failure proof lifting system for Reactor Vessel disassembly/reassembly evolutions.

As stated previously, the Unit 1 Reactor Building Crane is designed to meet the single failure proof criteria. To maintain the single failure proof status of the crane, and assure conformance with the intent of NUREG 0612 Phase II, a periodic crane inspection is necessary to nondestructively examine welds whose failure could cause a critical load drop. It was recognized that the need to lift/transport spent fuel shipping casks from the refueling floor would eventually arise. It was obvious, however, that the development of a safe load path from the refueling floor to the railroad bay exit of the Reactor Building, based on drop analyses, was not a viable course of action. Consequently, PP&L instituted a program for the periodic inspection required to maintain the single failure proof status of the Unit 1 Reactor Building Crane.

The first opportunity for heavy load movements involving shipping casks occurred in 1991 during the Fuel Pool Cleanout Project. Although the casks associated with that project were not as heavy as the 100 ton spent fuel shipping casks, their weights were significant enough to warrant the performance of the first periodic crane inspection prior to initiating any cask movement. Since that initial inspection, the crane has been reinspected either in the prescribed inspection program intervals or as necessary to support specific scheduled cask movements. Successful inspections ensure the single failure proof status of the crane, with respect to spent fuel shipping cask movements, is maintained.

In addition to the concerns for the integrity of the crane and its capability of ensuring a single failure proof condition, the intermediate handling systems (i.e. rigging, lifting devices, yokes, interfacing lift points, etc.) between the crane hook and the cask must similarly be single failure proof. The reliability of these handling systems to meet the single failure proof guidelines is addressed in NUREG 0612 by considering increased factors of safety or through redundancy/duality in active component design. The intermediate handling systems utilized in the Fuel Pool Cleanout Project were typically provided in a redundant manner (i.e. primary system plus redundant system) thereby satisfying the single failure proof requirement. Additionally, that approach is in conformance with the SSES licensing basis of FSAR section 15.7.5 regarding redundant sets of lifting devices for spent fuel casks.

Concerns for required restrictions on the load path or route of transport during the movement of heavy loads also need to be addressed. Lifts that involve the handling of heavy loads over spent fuel, fuel in the reactor core, or safety related equipment are not a recommended course of action for lifting systems that are not single failure proof. However, these lifts can be permitted with a single failure proof system, or after the evaluation of the consequences of a postulated load drop. At SSES, the transfer of heavy loads immediately adjacent to or over irradiated fuel in the reactor vessels or spent fuel pools is generally prohibited, however, there are a few exceptions that are simply unavoidable, e.g., transfer of main steam line plugs, cattle chute, etc. PP&L performed load drop analysis calculations which demonstrated the acceptability of these exceptions.

The discussion presented herein clearly indicates that PP&L's heavy loads program for SSES is in compliance with existing regulatory guidelines regarding the control of heavy load movements. This compliance is evidenced in the safety evaluation reports issued by the NRC staff which documented their acceptance and approval of PP&L's NUREG 0612 program for Phase I. Additionally, recognizing the increased severity and potential consequences of a heavy load drop during the refueling process, PP&L initiated efforts to further augment the heavy loads program. As a result, the heavy loads program for vessel assembly/disassembly at SSES was developed in accordance with the more stringent requirements of Phase II of the NUREG to further reduce the probability of a heavy load drop accident.

MOVEMENT OF SPENT FUEL CASKS

The Spent Fuel Storage Project, which is currently in the design stage, will provide supplemental dry storage of spent fuel using Vectra Technologies NUHOMS system and will follow the existing PP&L Phase II heavy loads approach in addressing the heavy load movement issues associated with the spent fuel casks. Utilization of the Unit 1 Reactor Building Crane, a single failure proof handling system, and a safe load path that avoids transport over the spent fuel pools and reactor core are being included in the design activities for this project. A descriptive change to the licensing basis, FSAR section 15.7.5 concerning the use of redundant sets of lifting

devices, has been identified with regard to heavy loads issues of this project. The proposed handling system supplied by the vendor consisting of a hook adapter, lifting yoke and transfer cask is a single failure proof handling system that is designed with twice the factor of safety margin instead of the use of redundancy or duality. The use of added safety factors is an acceptable approach to satisfy the Phase II requirements of NUREG 0612.

PP&L is evaluating the need for further changes to the licensing basis, including the Technical Specifications, to support the planned movement of spent fuel shipping casks. If a license amendment is determined to be needed to support the planned movement of spent fuel shipping casks, PP&L will submit the appropriate request.

