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May 25, 1983

Mr. A. Schwencer, Chief  
Licensing Branch No. 2  
Division of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Subject: Limerick Generating Station, Units 1&2  
Request for Information from the Licensee  
Qualification Branch

Reference: Telecon between B. Benedict and C. R.  
Endriss dated May 6, 1983

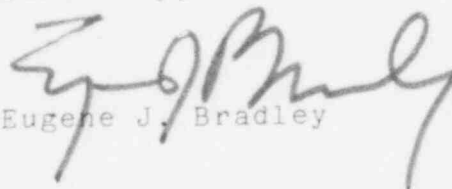
File: GOVT 1-1 (FSAR)

Dear Mr. Schwencer:

The attached documents are draft responses to Personnel  
Qualification Section DSER items 1 through 3 and Management  
Technology Section DSER items 1 and 2. A draft revision to  
FSAR Section 13.2.2.1.7 is also attached.

These changes will be formally incorporated into the FSAR  
revision scheduled for June, 1983.

Sincerely,



Eugene J. Bradley

RC/gra/11

cc: See Attached Service List

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*LQB/PQS item #1*

A comprehensive ~~re~~qualification training program conducted by the applicant for all licensed operators and senior licensed operators will be implemented within 3 months after issuance of the unit's operating license. This program will be conducted on a 2-year cycle and will be followed by successive 2-year programs which consist of the following areas:

Lecture Series

The requalification program will include planned lectures on a regular and continuing basis. Annual written examination results will indicate the scope and depth needed in the following areas:

- ° Reactor Theory and Principles of Reactor Operation
- ° General and Specific Operating Characteristics of the Plant
- ° Instrumentation and Control Systems
- ° Reactor Protection and Engineered Safety Systems
- ° Normal, Abnormal, and Emergency Operating Procedures
- ° Radiation Control and Safety; Radioactive Material Handling
- ° Fuel Handling and Core Parameters
- ° Administrative Procedures and Technical Specifications
- ° Applicable Portions of 10 CFR, Chapter I
- ° Nuclear Power Plant Design Features

In addition to the above areas, we require the applicant to modify the requalification program, as specified in H. R. Denton's March 28, 1980 letter, to include instruction in heat transfer, fluid flow, thermodynamics, and mitigation of accidents involving a degraded core. We will review the applicant's modification to the requalification program and report our safety evaluation in the SSER.

Response

*Section 13.2.2.1.1 has been changed to indicate that heat transfer, fluid flow, thermodynamics, and mitigation of core damage will be included in the lecture series.*

#### 13.2.1.5 Fire Protection Training

The objective of fire protection training is to ensure that the shift and plant staff Fire and Damage Teams are prepared and capable of responding to fire emergencies. Leaders of the Fire and Damage Teams receive initial training at the PECO Gas Operations Fire School or equivalent facility providing equivalent in-depth training. The remaining Fire and Damage Team members receive formal instruction which covers equipment and system usage and locations, methods, and procedures.

Fire drills will be performed quarterly for the Fire and Damage Team and annually a fire drill will include participation by an off-site fire company.

Fire protection training is included in General Employee Training for staff members and others described in Section 13.2.1.4. Personnel responsible for maintenance and inspection of fire protection equipment employ routine methods, such as review of vendor documents, drawings, and instructions, as necessary to perform their job functions as would be done for maintenance or inspection of other plant systems.

#### 13.2.1.6 Coordination with Preoperational Tests and Fuel Loading

Figure 13.2-1 shows the schedule for training in relation to the schedule of preoperational testing and fuel loading.

In the event fuel loading is delayed significantly, a refresher training course could be implemented or appropriate portions of the operator requalification program could be initiated.

### 13.2.2 REQUALIFICATION TRAINING PROGRAM

#### 13.2.2.1 Licensed Operator Requalification Training

The Licensed Operator Requalification Training Program for licensed and senior licensed operators will be established and ready for implementation no later than three months following issuance of the station operating license. The program is conducted on a two year cycle and will be followed by successive two year programs which meet or exceed the requirements of 10 CFR, Part 55, Appendix A as described below. The program, which takes into consideration holders of conditioned licenses (such as for fuel handling only), consists of the following:

##### 13.2.2.1.1 Lecture Series

The requalification program will include preplanned lectures on a regular and continuing basis. Annual written examination results will indicate the scope and depth needed in the following areas:

- a. Reactor Theory and Principles of Reactor Operation
- b. General and Specific Operating Characteristics of the Plant
- c. Instrumentation and Control Systems
- d. Reactor Protection and Engineered Safety Systems
- e. Normal, Abnormal, and Emergency Operating Procedures
- f. Radiation Control and Safety; Radioactive Material Handling
- g. Fuel Handling and Core Parameters
- h. Administrative Procedures and Technical Specifications
- i. Applicable Portions 10 CFR, Part 1
- j. Nuclear Power Plant Design Features

The lectures will be planned by the plant staff training organization and presented by that organization, by designated licensed or senior licensed operators, or by consultants. Films, videotapes, and self-study material may be used to supplement the lectures. An instructor shall participate in at least 50% of the lecture series. Lectures will be scheduled at a rate of not less than six per year, appropriately spaced through the year, and taking into consideration expected personnel availability and plant operations. Lectures may be deferred due to unexpected plant operations; however, these lectures shall be conducted as soon as practicable thereafter.

During the course of the Lecture Series, written examinations shall be administered. A Grade of less than 80% will require retaining and retesting in the subject matter covered by the examination.

The method of determining required attendance at lectures shall be defined. If attendance by all licensed individuals is not required, those exempted from attendance shall have demonstrated proficiency in the lecture topic by achieving at least a grade of 80% in that topic on the previous annual written examination.

#### 13.2.2.1.2 Reactivity Control Manipulations

Each licensed operator shall manipulate equipment and reactor controls within his license period.

Each senior licensed operator shall direct the activities of individuals or manipulate controls within his license period.

All licensed and senior licensed operators shall participate in simulator programs as part of the requalification program.

The following control manipulations and plant evolutions are acceptable for meeting the required reactivity control manipulations. The starred (\*) items shall be performed on an annual basis; the remaining items shall be performed in a two-year cycle. Those control manipulations that are not performed

LQB/POS item #2

(2) Training for Mitigating Core Damage (TMI TAP II.B.4)

*(in the response to question 630.17)*

The applicant has indicated that shift technical advisors and the operating personnel from the plant manager through the operation chain will receive training for mitigating core damage. Managers and technicians in the health physics and chemistry departments will receive mitigating core damage training commensurate with their responsibilities. However, the applicant has not addressed such training for the managers and technicians in the instrumentation and control department as required by Item II.B.4 of the TMI Action Plan.

Response

The response to question 630.17 has been changed to provide the requested information

### LQB/PQS item #3

1 Training program for mitigating Core Damage (TMI JAP II, P. 4)

The applicants indicates in the response to question 630.17<sup>that</sup> the training program for mitigating core damage will be provided prior to fuel loading. ~~The~~ program should be to the NRC

provided sufficiently in advance of fuel loading to allow for review and approval prior to fuel loading.

### Response

The response to question 630.17 has been changed to provide the requested information



QUESTION 630.17

Provide a training program for mitigating core damage as described in Item II.B.4 of NUREG-0737 in accordance with the guidance as specified in Enclosure 3 of H. R. Denton's letter dated March 28, 1980. Provide a listing of those individuals and their qualifications who must participate in the training program and provide a schedule for that training as related to the presently scheduled fuel load date.

RESPONSE

*The lesson plan for the*  
A training program for mitigating core damage will be ~~provided~~ *developed* prior to fuel loading and completed prior to full power operation. The course outline is presented below.

Core Cooling Mechanics *training will be*

- Alternate methods of core cooling
- Core spray and core flooding
- Heat removal paths
- Boron precipitation
- Fuel cladding quenching
- Limiting core conditions
- Steam and water cooling

## Potentially Damaging Operating Conditions

- Vulnerable plant operating conditions
- Core cooling with systems unavailable

## Gas/Steam Binding Affecting Core Cooling

- Sources of gas/steam vapor
- Symptoms/effects of gas/steam binding

## Recognizing Core Damage

- Data collection, instrumentation, and systems
- Fuel/clad behavior
- Reporting requirements

## Core Recriticality

- Reactor Shutdown margin
- Maintaining subcriticality
- Standby liquid control system
- Instrumentation response

## Hydrogen Hazards During Accidents

- Sources of hydrogen and oxygen
- Hazardous concentrations and reduction
- Gas venting



## LGS FSAR

Monitoring Critical Parameters During Accident Conditions  
Parameter identification  
Instrumentation reliability, accuracy, and failure

Radiation Hazards and Radiation Monitor Response  
Emergency plan implementation  
High radiation areas  
Sampling  
Radiation monitor response and failure

Criteria for Operation and Cooling Mode Selection  
Core cooling procedures  
Core cooling equipment and methods

Shift Technical Advisor and operating personnel from the Station Superintendent through the operations chain including the licensed operators will receive this training. Other plant managerial personnel and technicians in the health physics, and chemistry groups will receive training commensurate with their responsibilities, also

instrumentation and control

during accident conditions.

## LQB/MTS item #1

FSAR Table 13.1-1 is inadequate.

(a) Define "basic staffing" (in the footnote).

(b) The "schedule for filling" column is blank. Please provide this information.

(c) Show how the total number of positions given in FSAR Figure 13.1-2 will be filled over time until Unit 1 fuel loading and until Unit 2 fuel loading.

### Response

Section 13.1.1.4, Table 13.1-1, and the response to question 630.7 have been changed to address the above items

## CHAPTER 13

## TABLES

<u>Table</u>	<u>Title</u>
13.1-1	<i>Plant Staffing</i> <del>Staff Positions and Expected Schedule for Filling Vacancies</del>
13.1-2	Shift Crew Composition - Minimum Requirements
13.1-3	Qualification Resumes
13.1-4	Engineer-In-Charge Resumes

consultation and services in the areas of calibration, maintenance, and testing of transformers, switchgear, protective relays and devices, instrumentation, and controls. In regard to the support provided, supervisory personnel in the Metallurgical Group and the Station Tests Section meet the qualifications of "engineer-in-charge" as defined in Section 4.6.1 of ANSI/ANS-3.1 - 1978. Personnel in these sections have the benefit of experience gained through years of providing technical support to the Peach Bottom Atomic Power Station - Units 2 and 3 operating staff.

#### 13.1.1.2.4 Construction Division

The Construction Division is under the direction of the General Superintendent. The Construction Division has expertise and provides consultation and services in the areas of electrical and mechanical modification installation. In regard to the support provided, supervisory personnel and a substantial number of construction engineers meet the qualifications of "engineer-in-charge" as defined in Section 4.6.1 of ANSI/ANS-3.1 - 1978. Also, personnel in the Construction Division have the benefit of experience gained through years of providing support to the Peach Bottom Atomic Power Station - Units 2 and 3 operating staff.

#### 13.1.1.3 Contractors and Suppliers

The extensive experience of PECO in the nuclear industry may be supplemented when necessary by qualified contractors and suppliers. The capability of the PECO technical staff ensures that areas requiring the special expertise of certain contractors and suppliers are identified and that the work of such contractors and vendors is adequately monitored and evaluated to ensure proper completion.

#### 13.1.1.4 Status of Preoperational Activities

The Electric Production Department reviewed the control room and control panel layout to ensure that operating experience and human engineering objectives were incorporated into the design.

Staff recruiting for Limerick Generating Station commenced in 1978 and ~~is scheduled to proceed~~ as shown in Table 13.1-1. Training is discussed in Section 13.2.

*was completed*

The control program for preoperational testing has been prepared and issued. The implementation of the program was tested for the turnover and initial testing of certain nonnuclear systems that were subsequently operated to support construction. The preoperational testing is conducted in accordance with the control program and as described in Chapter 14.

Development of the plant maintenance program, which includes planning for spare parts, commenced in 1978 and is expected to be an ongoing function through initial startup and operation. Also, rigging drawings are being prepared to show lifting points and access requirements. Such drawings are reviewed by PECO.

### 13.1.2 OPERATING ORGANIZATION

#### 13.1.2.1 General

The station organizational chart for Limerick Generating Station is shown in Figure 13.1-2. This figure shows the title of each position, the number of persons expected to be assigned, and the positions for which reactor operator and senior reactor operator licenses are required. Table 13.1-1 shows the schedule for filling the station operating positions.

#### 13.1.2.2 Station Superintendent

The Station Superintendent, who reports to the Superintendent, Nuclear Generation Division, has the direct responsibility for all phases of plant operation and maintenance. The Station Superintendent is responsible for strict adherence to the operating license and technical specifications, safeguarding the general public and station personnel from radiation exposure, and for the safe, reliable, and efficient operation of the Limerick Generating Station.

In regard to the PECO as-low-as-reasonably-achievable (ALARA) program, the Station Superintendent is responsible for applicable functions of Regulatory Guide 8.8 (Rev 3) as follows:

- a. Ensuring support for the ALARA program from all station personnel

LGB/MTS #1

LGS FSAR

TABLE 13.1-1

~~STAFF POSITIONS AND EXPECTED SCHEDULE FOR FILLING VACANCIES~~

~~(BASED ON AUGUST 1984 FUEL LOAD FOR UNIT 1)~~

<u>POSITION</u>	<u>DATE</u> <u>APPOINTED</u>	<u>SCHEDULE</u> <u>FOR FILLING</u> <del>(1)</del>
Station Superintendent	1975	
Assistant Station Superintendent	1976	
Operations Engineer	1982	
Shift Superintendents	1981	
Shift Supervisors	1981	
Control Operators	1980	
Assistant Control Operators	1980	
Plant Operators	1982	
Assistant Plant Operators	1982	
Auxiliary Operators	1982	
Technical Engineer	1979	
Senior Health Physicist	1982	
Physicist-Applied	1983	
Physicist-Technical Support	1983	
Chemist-Supervisory		<del>1983</del>
Instrumentation and Controls Engineer	1981	
Reactor Engineer	1982	
Maintenance Engineer	1982	
Training Coordinator	1980	

~~(1) Basic staffing is expected to be complete in 1983 with  
augmentation in 1984 and again in 1985 to support  
Unit 2 fuel loading.~~

*This position is expected to be filled in 1982.*

## LGS FSAR

QUESTION 630.7

How many people are presently in the Plant Organization and what kind of professionals in each section?

RESPONSE

There are 107 people in the plant operating organization (as of 10-15-82). ~~Table 13.1-1 has been changed to indicate the status of plant organization staffing.~~

The kind of professionals in each section are:

*Replace with  
insert B*

A - Administrative

<u>Title</u>	<u>Number</u>	<u>Type of Degree</u>
Plant Superintendent	1	B.S. Mechanical Engineering & M.S. Mechanical Engineering
Ass't Plant Superintendent	1	B.S. Mechanical Engineering
Administrative Engineer	1	B.S. Mechanical Engineering

B - Operations

<u>Title</u>	<u>Number</u>	<u>Type of Degree</u>
Operations Engineer	1	B.S. Mechanical Engineering
Engineer	1	B.S. Engineering

C - Health Physics & Chemistry

<u>Title</u>	<u>Number</u>	<u>Type of Degree</u>
Senior Health Physicist	1	B.S. Environmental Health & M.S. Health Physics
Health Physicist	1	B.A. Geology & M.S. Environmental Science
Chemist	1	B.S. Chemistry & M.S. Nuclear Chemistry



D - Technical

<u>Title</u>	<u>Number</u>	<u>Type of Degree</u>
Technical Engineer	1	B.S. Mechanical Engineering
Engineer Supervisory	2	B.S. Mechanical Engineering
Engineer Supervisory	1	M.S. Mechanical Engineering
Engineer Supervisory	1	B.S. Engineering
Engineer	1	M.S. Mechanical Engineering
Engineer	7	B.S. Mechanical Engineering
Engineer	7	B.S. Electrical Engineering
Engineer	4	B.S. Chemical Engineering
Engineer	1	B.S. Nuclear Engineering

E - Maintenance

<u>Title</u>	<u>Number</u>	<u>Type of Degree</u>
Maintenance Engineer	1	B.S. Mechanical Engineering
Engineer	1	B.S. Mechanical Engineering & B.A. Physics

F - Startup

<u>Title</u>	<u>Number</u>	<u>Type of Degree</u>
Startup Director	1	B.S. Mechanical-Industrial Engineering
Engineer Supervisory	1	B.S. Mechanical Engineering
Engineer	1	B.S. Mechanical Engineering

G - Test Review

<u>Title</u>	<u>Number</u>	<u>Type of Degree</u>
Chairman of Test Review Board	1	B.S. Mechanical Engineering

H - Environment & Regulatory

<u>Title</u>	<u>Number</u>	<u>Type of Degree</u>
Environment & Regulatory Engineer	1	B.S. Mechanical Engineering & M.S. Mechanical Engineering

## Insert (B)

Table 13.1-1 indicates that plant staffing has been essentially completed as of May 1983. All senior plant staff members, licensed and non-licensed operators, and Shift Technical Advisors have been designated. Twenty-five individuals entered the HP & C technician training program during May 1983 and are expected to be qualified prior to power operation. Approximately ten additional experienced technicians will be obtained from the PECO Peach Bottom Atomic Power Station.

PECO Maintenance Division supervision has been assigned to the plant. PECO maintenance craftsmen will be assigned to the site as system turnover progresses and appropriately qualified individuals are available. Operating maintenance activities will be performed by contractor personnel under PECO direction until permanent personnel are assigned.

LQB/MT6 item #2

Identify the positions (A Co, R Co, etc.)  
that will fill the brigade.

Response

The response to question 630.9 has been changed to  
provide the requested information.

QUESTION 630.9

Fire Brigade: Discuss the Fire Brigade Organization and Membership.

RESPONSE

The Limerick fire brigade of at least 5 members will be maintained onsite at all times. The fire brigade composition may be less than the minimum requirements for up to 2 hours to accommodate unexpected absence, provided that immediate action is taken to fill the required positions. The fire brigade will not include the minimum shift crew necessary for safe shutdown of the unit(s) or any personnel required for other essential functions during a fire emergency. The brigade leader and at least 2 brigade members will have sufficient training in or knowledge of plant safety-related systems to understand the effects of fire and fire suppressants on safe shutdown capability. The qualification of fire brigade members will include an annual physical examination to determine their ability to perform strenuous fire fighting activities. The brigade leader will be competent to assess the potential safety consequences of a fire and advise control room personnel. Such competence by the brigade leader will be evidenced by possession of an operator's license or equivalent knowledge of plant safety-related systems. The responsibilities of the fire brigade are:

- a) Respond to fire alarms with appropriate equipment and protective clothing.
- b) Advise the Interim Emergency Director or Emergency Director as to the need for assistance from the plant staff or from offsite fire fighting groups.
- c) Coordinate the actions of offsite fire fighting groups if onsite assistance is requested.

*It is presently anticipated that the following plant personnel will be members of the fire brigade: Shift Supervisor (leader), Plant Operator, Assistant Plant Operator, and two Auxillary Operators.*

Evaluations will be critiqued with the individual concerned and filed in the individual's training records.

#### 13.2.2.1.7 Performance Review Program

A Performance Review Program will be implemented when the performance of a licensed operator or senior licensed operator falls below the following criteria:

- a. An annual written examination score of less than ~~70%~~<sup>80%</sup> overall *or 70% in any category*
- b. A substandard rating on the walk-through examination.
- c. Observation of inadequate performance of licensed responsibilities which is indicative of a need for special or accelerated retraining.

The Station Superintendent or Assistant Station Superintendent, the Operations Engineer, and a member of the plant staff training organization shall jointly determine a course of action to upgrade the individual's performance and/or plant knowledge and shall define the method(s) and criteria for evaluating the adequacy of the upgrading effort. The action to be taken in a particular case may depend upon factors such as identified weak areas, written and walk-through examination results, observed operational ability, theoretical understanding, or the results of supplementary oral or written examinations. As a minimum, an individual who receives less than ~~70%~~ overall on the annual written examination shall remain in the Performance Review Program until a score of at least ~~70%~~<sup>80%</sup> is obtained on a written examination in each of those areas in which less than ~~70%~~ was obtained in the annual written examination. If determined appropriate by the Station Superintendent, an individual will be removed from licensed responsibilities until completion of all or specified portions of the upgrading action.

#### 13.2.2.2 Non-licensed Operator Regualification Training

Non-licensed operators assigned to the shift positions of Auxiliary Operator, Assistant Plant Operator, and Plant Operator shall participate in the Non-licensed Operator Regualification Training Program. The program consists of the following:

##### 13.2.2.2.1 Design, Procedure, and License Change Review

This program ensures that appropriate revisions to the Operating Technical Specifications, Environmental Technical Specifications, procedures, and plant design are reviewed. When determined by the Plant Operations Review Committee, the Operations Engineer, or the plant training organization, document revisions and descriptions of plant design changes are attached to a signoff sheet and placed in a review notebook. As indicated on the signoff sheet, shift operators will review the attached document