QUESTION 331.1

Describe your ALARA design review process, including how the ALARA design review is factored into the overall design process. Describe the ALARA design guidance given to designers from various disciplines. Provide the qualifications and organizational position of the people responsible for the ALARA design review. Explain how expertise from the non-health physics disciplines is factored into the ALARA design review. Describe how the dose assessment presented in FSAR Section 12.4 is utilized in ALARA design and design review (1) to identify areas where ALARA changes are needed and (2) to identify areas where ALARA changes are needed and (3) to judge the cost-effectiveness of possible ALARA changes. Describe changes which were made in your design as a result of the ALARA design review and dose assessment.

RESPONSE:

The response is provided in Subsection 12.1.2.4.

QUESTION 331.2

Section 12.3.4 of Regulatory Guide 1.70, Revision 2 calls for information on the sensitivity of airborne radioactivity monitoring systems.

Describe how your continuous airborne radioactivity systems will provide adequate coverage of general areas, rooms, and corridors which have a possibility of containing airborne radioactivity and which may be occupied by personnel. In order to provide adequate coverage, the systems must be capable of detecting ten MPC-hours of airborne particulate and iodine radioactivity.

RESPONSE:

The response is provided in Subsection 12.3.4.

QUESTION 331.3

Your dose assessment as presented in FSAR Section 12.4 is not acceptable. Revise your dose assessment to incorporate the following:

(1) The collective doses presented under Routine Operations and Routine Maintenance should be based on expected dose rates rather than design dose rates to provide a more realistic estimate of dose.

(2) Dose estimates for In-Service Inspections, Waste Processing and Refueling should be calculated in the same manner as you calculated the doses for Routine Operations and Maintenance.

The use of averages from operating plant exposure data is acceptable for Special Maintenance. However, those averages should be tailored to your design.

Changes which you have made in your design to reduce doses in performing special maintenance should be reflected in your man-rem estimates.

RESPONSE:

The response is provided in Subsection 12.4.1.3.9.

QUESTION 331.4

It is our position that the minimum qualifications of the Health Physics Supervisor on-site should meet the guidance of Regulatory Guide 1.8, Revision 1. An individual, normally stationed off-site, who meets these minimum qualifications is not acceptable to meet Regulatory Guide 1.8. Section 12.5.1.4 should be revised to meet this criteria of Regulatory Guide 1.8.

RESPONSE:

See revised Subsection 12.5.1.4.

QUESTION 331.5

Describe the radiation protection aspects of decommissioning that you have included in your design to insure that occupational dose will be "ALARA."

RESPONSE:

The design features necessary to maintain radiation exposures ALARA during decommissioning operations are, in general, the features that have been implemented to keep exposures ALARA during the operational life of the plant. These are discussed in detail in Sections 12.1 and 12.3. Some of these features which are especially applicable to decommissioning are:

a. Flushing and draining connections which will provide for removal of radioactive fluids, allow rinsing to reduce residual activity, and provide an entry point for introduction of decontamination solutions.

b. Ventilation systems to minimize the spread of airborne radioactivity will be particularly useful in preventing exposures to internal radioactivity during decommissioning when large quantities of airborne radioactive particulates can be generated by cutting, sawing, and demolition.

c. The space envelopes reserved around equipment to facilitate maintenance will also allow for more rapid dismantling since cutting machines and the like can be installed that much quicker with correspondingly lower exposure time.

d. The use of flanged connections on pumps in radioactive waste systems and the removal provisions built into some major plant components will reduce personnel exposures during removal of these items.

e. Separation of radioactive from non-radioactive systems and location of active components of non-radioactive systems in low radiation areas will permit dismantling of normally clean systems with minimal exposure to personnel.

f. The availability of a complete, shielded, radwaste facility will allow efficient, low dose processing of residual fluids and decontamination solutions, as well as the packaging and shipping of solid radioactive

materials. Other existing facilities such as access control stations and decontamination areas will also perform their intended functions in helping to keep exposures ALARA.

g. The use of liners and protective coatings will lower exposures by minimizing decontamination times and by reducing the quantities of materials that must be handled as radioactive waste.

QUESTION 331.6

Describe the additional shielding that you have provided for personnel and equipment hatches or penetrations that pass through the drywell wall to attenuate the radiation to below the required level defined by the radiation zone outside the drywell wall during normal operation and anticipated operational occurrences. (FSAR pg. 12.3-9)

RESPONSE:

This description is contained in revised Subsection 12.3.2.2.2.

QUESTION 331.7

Provide a breakdown of the activities which are included in the total 237.7 man-rem/unit for routine maintenance. Regulatory Guide 8.19, "Occupational Radiation Dose Assessment in Light Water Reactor Plants Design Stage Man-Rem Estimates," which has been published for comment will provide further guidance.

RESPONSE:

The method used to estimate the routine maintenance dose for Susquehanna is discussed in revised Subsection 12.4.1.3.2.

QUESTION 331.8

Your estimate in FSAR Tables 12.2-35 and 36 of the airborne radioactivity which workers will be exposed to does not include tritium. Include tritium in your estimate and in your dose assessment analysis.

RESPONSE:

Subsections 12.2.2.6 and 12.2.2.7 as well as Tables 12.2-30, 12.2-31, 12.2-35, 12.2-36, 12.2-37, 12.4-10 and 12.4-11 have been revised to include the requested information.

QUESTION 331.9

Preparing for maintenance and inspection in the high radiation fields near the reactor coolant system at shutdown can result in significant man-rem. Discuss how you plan to minimize personnel exposure using the "ALARA" guideline. Include also access to areas with limited passageway, i.e., equipment hatches, personnel locks, manholes, etc.

RESPONSE:

In order to minimize personnel exposure, the following have been included in the design and procedures for Susquehanna SES:

1. Prior to maintenance in certain areas, mockups will be used.

2. Permanent work platforms are provided in high radiation areas.

3. Flushing connections on systems are provided to relieve crud build-up.

4. Snap-on insulation will be used.

5. Hinged doors are provided on shield wall for access to RCPB piping.

6. Use of removable shield plugs.

The administrative controls exercised when preparing for maintenance and inspection activities in high radiation fields are described in Subsection 12.5.3.

QUESTION 331.10

Describe the features that you have incorporated into your design to maintain occupational radiation exposure ALARA by minimizing and controlling the buildup, transport and deposition of activated corrosion products in reactor coolant and auxiliary systems. Include information on the following steps taken to minimize Co-58 and Co-60, including:

(1) The use of reduced nickel content in systems in contact with reactor coolant.

(2) The low cobalt impurity specification in system in contact with reactor coolant.

(3) The minimization of high cobalt, hard facing wear materials in the systems in contact with reactor coolant.

(4) The use of high flow rate/high temperature filtrations for systems in contact with reactor coolant.

(5) The selection of valves and packings materials to minimize crud buildup and maintenance.

(6) Provisions for decontamination of components and systems contaminated with activated corrosion products.

(7) The types of cleanup systems for removal of crud from primary coolant during operation.

RESPONSE:

See new Subsection 12.3.1.4 for this response.

QUESTION 331.11

You have not described an in-plant accident radiation and airborne radioactivity monitoring system as required in our standard review plan.

It is our position that the in-plant accident radiation and airborne radioactivity monitoring systems should provide personnel with the capability to assess the radiation hazard in areas which may need to be accessed during the course of an accident. The accident monitoring systems may include the normal area radiation monitors, airborne radioactivity monitors, and portable radiation monitoring equipment. The accident monitoring systems should have a usable range which includes the maximum calculated accident levels, and they should be designed to operate properly in the environment caused by the accident. Describe your accident monitoring systems, and describe how your systems will meet this position.

RESPONSE:

See Subsection 18.1.30 for the discussion on accident monitoring instrumentation.

QUESTION 331.12

Radiation dose rates in excess of 100 rads per hour can occur in the vicinity of spent fuel transfer tubes. It is our position that the SFTT area should have structural barriers to prevent inadvertent access to the high radiation levels near the area and sufficient shielding to assure acceptable radiation levels in adjacent occupied areas. Provide plan and elevation layout drawings of the SFTT areas, including these adjacent areas. Your response should include procedures for positive access control and radiation monitoring in the areas near the SFTT, as well as audible and visible radiation alarm signals to be actuated if radiation fields increase above ambient levels in the area. (Describe how your spent fuel transfer tube operation meets this position.)

RESPONSE:

There are no Spent Fuel Transfer Tubes at the Susquehanna SES. For a description of the Fuel Storage and Handling Systems, see Section 9.1.

QUESTION 331.13

It is our position that decommissioning will be in accordance with Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposure at Nuclear Power Stations will be ALARA." Revision 3, June, 1978. Verify that decommissioning will be in accordance with Regulatory Guide 8.8 or submit equivalent alternative.

RESPONSE:

Decommissioning of the Susquehanna SES will be in accordance with all applicable NRC regulations in effect including those related to occupational exposure.

The NRC has since 1975 been in the process of re-evaluating decommissioning policies and is now considering amending existing regulations to provide more specific guidance on decommissioning criteria for production and utilization facility licensees.

In light of future regulatory uncertainty, and potential decommissioning technology evolution, it is not prudent at this time for PP&L to establish detailed methods of implementing specific parts of existing Commission Regulations.

QUESTION 331.14

Provide results of design review for additional shielding required to provide access to vital areas and protect safety equipment after a core degradation accident.

RESPONSE:

A study on the requirements for additional shielding to provide access to vital areas and protect safety equipment after a core degradation accident has been performed. The results of this study are discussed in Subsection 18.1.20.

QUESTION 331.15

Provide a description of the radiation protection features incorporated in the system for sampling and analyzing reactor coolant and containment atmosphere after a core degradation accident.

RESPONSE:

The system for sampling and analyzing reactor coolant and containment atmosphere after a core degradation accident has been designed. This system is discussed in Subsection 18.1.21.

QUESTION 331.16

Table 13.1-2 of your FSAR states that you will fill the position of Health Physics Supervisor 90 days prior to fuel loading. In Section 12.5.1.4 you have committed that the individual filling the Health Physics Supervisor will meet the criteria for Radiation Protection Manager in Regulatory Guide 1.8. Your technical specifications will also require such qualifications. You should provide a resume of the education, training, and experience of the individual selected to fill this position as soon as it is available.

RESPONSE:

See Table 13.1-2 for resume of the Health Physics Supervisor.

QUESTION 331.17

Section 12.5.3.7.2.6 of the FSAR states that an individual will be considered qualified as a Health Physics Monitor after the initial training period of one year. Your technical specifications will require that your Plant Staff meet the qualifications of ANSI 18.1. This ANSI Standard requires two years' experience before an individual is considered qualified as a radiation protection technician. If you wish to propose an alternative qualification program for your Health Physics Monitors, you should provide a detailed description of the qualification program. Otherwise your FSAR should be amended to show Health Physics Monitor qualification per ANSI 18.1.

RESPONSE:

The resumes of the Health Physics Monitors, and a table summarizing the training program for Health Physics Monitors was submitted by letter dated March 27, 1981 (PLA 693, Curtis to Youngblood.)

QUESTION 331.18

It appears that two neutron survey meters are not adequate to meet the anticipated needs of a two unit plant. You should provide a table to show equipment adequate to operate a two unit plant. In addition, you should provide a table specifying the quantity and types of respiratory protection equipment available.

RESPONSE:

A table showing survey equipment was submitted by letter dated March 27, 1981 (PLA 693, Curtis to Youngblood).

The quantities and types of respiratory protection equipment was submitted by letter date April 16, 1981 (PLA 728, Curtis to Youngblood.)

QUESTION 331.19

On 1/22/81 you made preliminary response to TMI-related requirements in NUREG-0737. In your final responses you should provide the information requested in Sections 11.B.2, 11.F.1(3) and III.D.3.3 of NUREG-0737.

RESPONSE:

Responses to all items in NUREG-0737, including II.B.2, II.F.1, and III.D.3.3, were transmitted by letter dated March 16, 1981 (PLA-659, Curtis to Youngblood).