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Docket No.: 50-352/353

Mr. Edward G. Bauer, Jr.
Vice President & General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Bauer:

Subject: Open SER Items and Request for Additional Information - Limerick

The enclosures to this letter identify additional open items in our draft Safety Evaluation Report and also identify additional requests for additional information. The involved technical areas of the staff's review are as listed below:

Structural and Geotechnical Engineering Branch
220 Structural Engineering

Materials Engineering Branch
250 Inservice Inspection
251 Component Integrity

Meteorology and Effluent Treatment Branch
451 Meteorology

Licensee Qualification Branch
630 Management Technology
630 Personnel Qualifications

Please provide us within seven working days from receipt of this letter, with an action plan and the associated dates for your response to these issues. In some few cases, there is no action identified for PECO at this time since the staff is simply advising you that the review on such subjects is continuing. Any questions concerning the enclosures should be directed to Mr. Robert E. Martin (301) 492-8332, the Licensing Project Manager.

Sincerely,

Original signed by:

A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing

8306150579 830603
PDR ADOCK 05000352
E PDR

Enclosures: As stated

cc: See next page

OFFICE			DL:LB#2/PM	DL:LB#2/BC			
SURNAME			RMartin:pt	ASchwencer			
DATE			6/3/83	6/3/83			

NRC FORM 318 (10-80) NRCM 0240 OFFICIAL RECORD COPY USGPO: 1981—335-960

Limerick

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STRUCTURAL AND GEOTECHNICAL ENGINEERING BRANCH
REQUEST FOR ADDITIONAL INFORMATION

220.21 Section 2.2.1 of the staff's Draft Safety Evaluation Report states, in part, that the applicant used a value of 5.1 psi on the Diesel Generator Building for the peak reflected overpressure due to the accidental detonation of a boxcar of explosives on the Conrail Reading rail line which passes through the plant site. The staff has indicated that the correct value for the peak reflected overpressure is approximately 13 psi. The applicant is requested to evaluate the affected Category I structures for the higher value of 13 psi, and demonstrate that the structural integrity of the affected structures is not impaired.

NOTE: The response to this question should be coordinated with the response to the Siting Analysis Branch (311) open issues on this subject which was transmitted to PECO by the staff's letter dated March 11, 1983.

Structural and Geotechnical Engineering Branch
Request for Information
Limerick Generating Station
Docket No. 50-352

220.22 (DAR) The following concerns are related to your responses in relation to questions 220.17 and 220.19.

a) In response to question 220.17 you indicated the DAR sections where stress margins for various structures or structural components can be found. A review of the values provided indicates in some of the cases there is little margin left. In your response to question 220.20, it is observed that some incorrect pressure values have been used in the investigation of liner fatigue. In view of this latter observation provide your assurance that the actual stress does not extend beyond the margin in those cases where there is barely any margin.

b) In response to question 220.19 you indicated that damping values greater than 7% of critical are used. In Section 7.1.8.1 it is stated that in the analysis and design of electrical raceway system, different damping values are used for different support systems and different loading conditions. In addition it is stated that the damping ratios used for the electrical raceway assessment are in accordance with Reference 7.1-12. Provide the justification for using different damping values for different support systems and for different loading conditions and state clearly what damping values are used for electrical raceway assessment. The use of damping values greater than those specified in Regulatory Guide 1.61 should be justified.

MATERIALS ENGINEERING BRANCH

250 INSERVICE INSPECTION SECTION

This review addresses inspections conducted prior to plant operation (preservice inspection, PSI) of the reactor coolant pressure boundary (RCPB) and of the ASME Code Class 2 and 3 components. The term "inservice inspection" as used herein should be understood to apply to the pre-operational (preservice) inspection activities unless otherwise noted. The program for the periodic inspections (ISI) to be conducted during the operation of the plant will be defined at a later time by the applicant based on the date of issuance of the operating license and the requirements of 10 CFR 50.55a. The staff's objective will be to complete review of the ISI program prior to the first refueling outage which is when the ISI program commences.

The preservice inspection for Limerick is being performed in three distinct segments as follows: (1) Class 1, 2, and 3 piping systems; (2) reactor pressure vessels, including internals, out to and including the safe end to pipe welds; and (3) pump and valve tests. The first two of these are being reviewed by the Materials Engineering Branch as discussed herein. The third segment is to be addressed by the Mechanical Engineering Branch at a later time.

1. ASME Code Class 1 Components 5.2.4.1 Compliance with the Standard Review Plan

   This section comments on the review of the Limerick Preservice Inspection Program relative to the applicable SRP section for ASME Code Class 1 Components. The July 1981 Edition of the "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants", (NUREG-0800) includes Section 5.2.4, "Reactor Coolant Pressure Boundary Inservice Inspection and Testing." The Limerick Generating Station, Units 1 and 2, review is continuing because the applicant has not submitted a complete Preservice Inspection (PSI) Program and has not completed the PSI examinations. The staff review to date was conducted in accordance with Standard Review Plan (SRP) Section 5.2.4 except as discussed below.

SRP Section 5.2.4.II.4, Inspection Intervals

The LGS PSI program has not been reviewed against this section because this areas applies only to inservice inspections (ISI), not to the preservice inspection. This subject will be addressed during review of the ISI program after licensing.

SRP Section 5.2.4.II.5, Evaluation of Examination Results

The LGS PSI program has been reviewed against this section. The staff notes that the applicant has committed to incorporate the ASME Code Section IWB-3000 "Standards for Examination Evaluation" into the PSI program. This is consistent with the July 1981 revision of the SRP.

The staff makes no finding on this issue at this time for the PSI. Ongoing NRC generic activities and research projects indicate that the presently specified ASME Code procedures may not always be capable of detecting the acceptable size flaws specified in the IWB-3000 acceptance standards. For example, ASME Code procedures specified for volumetric examination of reactor vessels, bolts and studs, and piping have not proven to be capable of detecting the acceptable size flaws in all cases.

Development of new or improved procedures will be evaluated and the staff will require that these improved procedures be made a part of the inservice (ISI) examination requirements.

With respect to SRP Section 5.2.4.II.5.b, the applicant's repair procedures based on ASME Code Section IWB-4000, "Repair Procedures" have not been reviewed. Repairs are not generally required in the PSI program. This subject will be addressed during review of the ISI program.

SRP Section 5.2.4.II.8, Relief Requests

The LGS PSI program review of this area has not been completed because the applicant has not identified all limitations to examination. Specific areas where ASME Code examination requirements cannot be met will be identified as performance of the PSI progresses. The complete evaluation of the PSI program will be presented in a supplement to the SER after the applicant submits the required examination information and identifies all plant-specific areas where ASME Code Section XI requirements cannot be met and provides a supporting technical justification.

5.2.4.2 Examination Requirements

General Design Criterion 32, "Inspection of Reactor Coolant Pressure Boundary", Appendix A of 10 CFR Part 50 requires, in part, that components which are part of the reactor coolant pressure boundary be designed to permit periodic examination and testing of important areas and features to assess their structural and leak-tight integrity. To ensure that no deleterious defects develop during service, selected welds and weld heat-affected-zones (HAZ) will be examined periodically at Limerick Generating Station, Units 1 & 2.

The design of the ASME Code Class 1 and 2 components of the reactor coolant pressure boundary incorporates provisions for access for inservice examinations, as required by Paragraph IWA-1500 of Section XI of the ASME Code. Section 50.55a(g), 10 CFR Part 50, defines the detailed requirements for the preservice and inservice inspection programs for light water cooled nuclear power facility components. Based upon the construction permit date of June 19, 1974, this section of the regulations requires that a preservice inspection program be developed and implemented using at least the Edition and Addenda of Section XI of the ASME Code in effect six months prior to date of issuance of the construction permit. It is the intent of the Applicant to comply with the PSI requirements of the 1974 Edition of the Code including Addenda through Summer 1975, as required by 10 CFR 50.55a(g)(2).

The initial ISI program must comply with the requirements of the latest Edition and Addenda of Section XI of the ASME Code in effect twelve months prior to the date of issuance of the operating license, subject to the limitations and modifications listed in Section 50.55a(b) of 10 CFR Part 50.

5.2.4.3 Evaluation of Compliance with 10 CFR 50.55a(g) for Limerick Generating Station, Units 1 & 2

Review has been completed on the information presented in the FSAR, supplemental information from the Applicant in a letter dated May 21, 1982, and the partial PSI Program submitted on September 24, 1982. The preservice examination for Unit 1 is being performed based on the requirements of the 1974 ASME Boiler and Pressure Vessel Code, Section XI through the Summer 1975 Addenda with Appendix III of the Winter 1975 Addenda and paragraph IWA-2232 of the Summer 1976 Addenda. The reactor pressure vessels will be examined in accordance with the 1980 ASME Code, Section XI including the Winter 1980 Addenda. Based on review of the above documents, additional information has been requested in order to complete the review.

In a letter dated January 7, 1983, the Applicant stated a position to use visual examiners qualified in accordance with ANSI N45.2.6 for conducting hanger visual examinations. The Staff has determined that this position is acceptable, based on the fact that qualification of visual examiners for examination of hangers in accordance with ANSI N45.2.6 is specified in later editions and addenda of the ASME Code Section XI which are accepted and referenced in 10 CFR 50.55a.

The specific areas where the Code requirements cannot be met will be identified after the examinations are performed. The Applicant has committed to identify all plant-specific areas where the Code requirements cannot be met and provide a supporting technical justification for relief. The SER will be completed after the Applicant provides the following information:

(1) Dockets a complete and acc[illegible]able PSI Program for both Units.

(2) Submits the requested additional information regarding the PSI/ISI program.

(3) Submits all relief requests with a supporting technical justification.

Evaluation of the Limerick Generating Station Units 1 & 2 PSI Program will be presented in a supplement to the SER after the Applicant provides an acceptable response to the above requirements.

The initial inservice inspection program has not been submitted by the Applicant. This program will be evaluated after the applicable ASME Code Edition and Addenda can be determined based on Section 50.55a(b) of 10 CFR Part 50, but before the first refueling outage when inservice inspection commences.

2. ASME Code Class 2 and 3 Components 6.6.1 Compliance with the Standard Review Plan

This section comments on the review of the Limerick Preservice Inspection Program relative to the applicable SRP sections for ASME Code Class 2 and 3 components.

The July 1981 Edition of the "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants", (SRP, NUREG-0800) includes Section 6.6, "Inservice Inspection of Class 2 and 3 Components". The Limerick Generating Station, Units 1 & 2 review is continuing because the Applicant has not submitted a complete Preservice Inspection (PSI) Program and has not completed the PSI examinations. The Staff review to date was conducted in accordance with Standard Review Plan Section 6.6 except as discussed below.

SRP Section 6.6.II.4, Inspection Intervals

The LGS PSI program has not been reviewed against this section because this area applies only to Inservice Inspection (ISI) not to PSI. This subject will be addressed during review of the ISI program after licensing.

SRP Section 6.6.II.5, Evaluation of Examination Results

The LGS PSI program has been reviewed against this section. The staff notes that the applicant has committed to incorporate the ASME Code Sections IWC-3000 and IWD-3000 "Standards for Examination Evaluation" into the PSI program. This is consistent with the July 1981 revision of the SRP.

The staff makes no finding on this issue at this time for the PSI. Ongoing NRC generic activities and research projects indicate that the presently specified ASME Code procedures may not always be capable of detecting the acceptable size flaws specified in these standards. For example, ASME Code procedures specified for volumetric examination of vessels, bolts and studs, and piping have not proven to be capable of detecting acceptable size flaws in all cases.

Development of new or improved procedures will be evaluated and the staff will require that these improved procedures be made a part of the inservice examination requirements.

With respect to SRP Section 6.6.1.5, the applicant's repair procedures based on ASME Code Sections IWC-4000 and IWD-4000, "Repair Procedures" have not been reviewed. Repairs are not generally required in the PSI program. This subject will be addressed during review of the ISI program.

SRP Section 6.6.II.7, Augmented ISI

The LGS PSI program review of this subject has not been completed because this subject has not yet been addressed in the applicant's PSI program. The applicant's augmented ISI program will be reviewed after it is submitted.

SRP Section 6.6.II.9, Relief Requests

The LGS PSI program review of this subject has not been completed because the Applicant has not identified the limitations to examination. Specific areas where ASME Code examination requirements cannot be met will be identified as performance of the PSI progresses. The complete evaluation of the PSI program will be presented in a supplement to the Safety Evaluation Report (SER) after the Applicant submits the required examination information and identifies all plant-specific areas where ASME Code Section XI requirements cannot be met and provides a supporting technical justification.

6.6.2 Examination Requirements

General Design Criteria 36, 39, 42, and 45, Appendix A of 10 CFR Part 50, require, in part, that the Class 2 and 3 components be designed to permit appropriate periodic inspection of important components to ensure system integrity and capability. Section 50.55a(g) of 10 CFR Part 50 defines the detailed requirements for the preservice and inservice inspection programs for light water cooled nuclear power facility components.

Based upon the construction permit date of June 19, 1974, this section of the regulations requires that a preservice inspection program for Class 2 and 3 components be developed and implemented using at least the Edition and Addenda of Section XI of the ASME Code in effect six months prior to the date of issuance of the construction permit. It is the intent of the Applicant to comply with the PSI requirements of the 1974 Edition of the Code with Addenda through Summer 1975, as required by 10 CFR 50.55a(g)(2).

The initial ISI program must comply with the requirements of the latest Edition and Addenda of Section XI of the ASME Code in effect twelve months prior to the date of issuance of the operating license, subject to the limitations and modifications listed in Section 50.55a(b) of 10 CFR Part 50.

6.6.3 Evaluation of Compliance with 10 CFR 50.55a(g) for Limerick Generating Station Units 1 & 2

Review has been completed on the information presented in the FSAR, supplemental information from the Applicant in a letter dated May 21, 1982, and the partial PSI Program submitted September 24, 1982. The preservice examination for Unit 1 is being performed based on the requirements of the 1974 ASME Boiler and Pressure Vessel Code, Section XI through Summer 1975 Addenda with Appendix III of the Winter 1975 Addenda and paragraph IWA-2232 of the Summer 1976 Addenda. Based on review of the above documents, additional information has been requested in order to complete the review.

In a letter dated January 7, 1983, the Applicant stated a position to use visual examiners qualified in accordance with ANSI N45.2.6 for conducting hanger visual examinations. The Staff has determined that this position is acceptable, based on the fact that qualification of visual examiners for examination of hangers in accordance with ANSI N45.2.6 is specified in later editions and addenda of the ASME Code Section XI which are accepted and referenced in 10 CFR 50.55a.

The specific areas where the Code requirements cannot be met will be identified after the examinations are performed. The Applicant has committed to identify all plant-specific areas where the Code requirements cannot be met and provide a supporting technical justification for relief. The SER will be completed after the Applicant provides the following information:

(1) Dockets a complete and acceptable PSI Program for both Units.

(2) Submits the requested additional information regarding the PSI/ISI program.

(3) Submits all relief requests with a supporting technical justification.

Evaluation of the Limerick Generating Station, Units 1 & 2 PSI Program will be presented in a supplement to the SER after the Applicant provides an acceptable response to the above requirements.

The initial inservice inspection program has not been submitted by the Applicant. This program will be evaluated after the applicable ASME Code Edition and Addenda can be determined based on Section 50.55a(b) of 10 CFR Part 50, but before the first refueling outage when inservice inspection commences.

3. References

(a) Final Safety Analysis Report through Revision 7 (June 1982)
(b) Preservice Inspection program submitted by letter dated September 24, 1982
(c) Letter from applicant dated May 21, 1982
(d) NUREG-0800, Standard Review Plan, Sections 5.2.4 and 6.6 dated July 1981
(e) Code of Federal Regulations, Volume 10, Part 50
(f) American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI

1974 Edition through Summer 1976 Addenda
1980 Edition through Winter 1980 Addenda

REQUEST FOR ADDITIONAL INFORMATION
MATERIALS ENGINEERING BRANCH
INSERVICE INSPECTION SECTION

250.1 Clarify the inconsistency between FSAR Tables 5.2-10 "Inservice Testing and Inspection - Class 1 Component" (sections A, C, and D) and Table 6.6-1 "Inservice Testing and Inspection - Class 2 Components" (pressure vessel, pumps, and valve sections) and Sections 5.2.4 and 6.6 of the May 21, 1982 letter from John S. Kemper, Philadelphia Electric Company to Harold R. Denton, NRC which states that the preservice inspection for reactor pressure vessels, pumps, and valves will meet the requirements of the 1980 ASME Code Section XI including the Winter 1980 Addenda.

250.2 Plans for preservice examination of the reactor pressure vessel welds should address the degree of compliance with Regulatory Guide 1.150 in accordance with NRC Generic Letter No. 83-15 dated March 23, 1983.

250.3 Sections 5.2.4 and 6.6 of the Limerick Generating Station FSAR and the partial PSI Program (Rev. 5), submitted with a letter dated September 24, 1982, reference ASME Code Section XI, Appendix III of the Winter 1975 Addenda and Paragraph IWA-2232 of the Summer 1976 Addenda which has not been referenced in 10 CFR 50.55a(b). Note that 10 CFR 50.55a(b) states that when applying the 1974 ASME Section XI Code Edition, only the Addenda through Summer 1975 may be used. If Appendix III is used it must be used in conjunction with Summer 1978 Addenda or later Addenda as referenced by 10 CFR 50.55a(b). Plant specific approval has been granted to use Appendix III of the Winter 1975 Addenda if the Applicant demonstrates that the provisions used are equivalent or superior to the requirements of referenced editions of Section XI Code.

In later editions of the ASME Code, Appendix III of Section XI, is specified for ferritic piping welds. If this requirement is not applicable (for example, for austenitic piping welds), ultra sonic examination is required to be conducted in accordance with the applicable requirements of Article 5 of Section V, as amended by IWA-2232. Discuss the criteria for applying Article 5 of Section V, as amended by IWA-2232. Provide a technical justification for any alternatives used such as Section XI, Appendix III, Supplement 7, for austenitic piping welds and discuss the following:

A. All modifications permitted by Supplement 7.

B. Methods of ensuring adequate examination sensitivity over the required examination volume.

C. Methods of qualifying the procedure for examination through the weld (if complete examination is to be considered for examinations conducted with only one side access).

When using Appendix III of Section XI for preservice or inservice examination of either ferritic or austenitic piping welds the following should be incorporated:

A. Any crack-like indication, 20% of DAC or greater, discovered during examination of piping welds or adjacent base metal materials should be recorded and investigated by a Level II or Level III examiner to the extent necessary to determine the shape, identity, and location of the reflector.

B. The Owner should evaluate and take corrective action for the disposition of any indication investigated and found to be other than geometrical or metallurgical in nature.

250.4 Clarify the discrepancy between Limerick FSAR Section 3.6.2.6 which states that "guard pipe assemblies are not used in this plant" and Section 6.6.8 Augmented Inservice Inspection to Protect Against Postulated Piping Failures, paragraph (c) which states "Inspection ports are provided in guard pipes to permit examination of circumferential pipe welds."

High energy lines within the "break exclusion" of the containment penetration area, whether encased in guard pipes or not, must receive augmented preservice/inservice examination regardless of the requirements of Section XI of the ASME Code as discussed in SRP 3.6.1 and 3.6.2. However, high energy lines meeting the "modified break exclusion region" criteria need not be subjected to augmented preservice/inservice examination. The "modified break exclusion region" criteria may be applied in those special cases in which guard pipes are necessary, and it has been demonstrated to the satisfaction of the NRC that access to perform an examination is extremely difficult to achieve. In such areas the examination requirements may be eliminated provided the guard pipe is designed for the full dynamic effects of a longitudinal or circumferential break of the enclosed process pipe including jet impingement, pipe whip impact and environmental effects.

If the high energy fluid system piping does not meet the "modified break exclusion region" criteria, submit the required augmented preservice/inservice examination program for this piping.

Confirm that high energy fluid system piping between containment isolation valves will receive an augmented examination as follows:

A. Protective measures, structures, and guard pipes should not prevent the access required to conduct the inservice examination specified in the ASME Code, Section XI.

B. For those portions of high energy fluid system piping between containment isolation valves, the extent of inservice examination completed during each inspection interval (ASME Code Section XI) should provide 100% volumetric examination of circumferential and longitudinal pipe welds within the boundary of these portions of piping.

C. For those portions of high energy fluid system piping enclosed in guard pipes, inspection ports should be provided in the guard pipes to permit the required examination of circumferential pipe welds. Inspection ports should not be located in that portion of the guard pipe passing through the annulus of dual barrier containment structures.

D. For those items requiring ISI, a baseline or preservice examination for establishing the integrity of the original condition is also required by the ASME Code.

Confirm that the augmented examination for high energy system piping is maintained throughout the entire piping system up to the outboard restraint. If the restraint is located at the isolation valve, a classification change at the valve interface is acceptable.

Confirm that welds between outboard containment isolation valves and piping restraints are included in the PSI and ISI program plan as required.

250.5 FSAR Sections 5.2.4 and 6.6 state that "preservice/inservice inspections will be conducted, to the extent practical within the limitations of design, geometry, and materials of construction. Should certain Code Section XI requirements be determined to be impractical in the course of inspecting the components, PECo will submit a request for relief from the requirements to the NRC in accordance with the provisions of 10 CFR 50.55a(g)(5)."

Indicate the anticipated date for submittal of this information and all requests for relief from impractical examinations. The Preservice Inspection Program should include the following information:

A. For ASME Code Class 1 and 2 components, provide a table similar to IWB-2600 and IWC-2600 confirming that either the entire Section XI preservice examination was performed on the component or relief is requested with a technical justification supporting the request.

B. Where relief is requested for pressure retaining welds in the reactor vessel, identify the specific welds that did not receive a 100% preservice ultrasonic examination and estimate the extent of the examination that was performed.

C. Where relief is requested for piping system welds (Examination Category B-J, C-F, and C-G), provide a list of the specific welds that did not receive a complete Section XI preservice examination including drawing or isometric identification number, system, weld number, and physical configuration; e.g., pipe-to-nozzle weld, etc. Estimate the extent of the preservice examination that was performed. When the volumetric examination was performed from one side of the weld, discuss whether the entire weld volume and the heat affected zone (HAZ) and base metal on the far side of the weld were examined. State the primary reason that a specific examination is impractical; e.g., support or component restricts access, fitting prevents adequate ultrasonic coupling on one side, component-to-component weld prevents ultrasonic examination, etc. Indicate any alternative or supplemental examinations performed and method(s) of fabrication examination.

Detailed guidelines for the preparation and content of relief requests are attached as Appendix A to these questions.

APPENDIX A

GUIDANCE FOR PREPARING REQUESTS FOR RELIEF FROM
CERTAIN CODE REQUIREMENTS PURSUANT TO 10 CFR 50.55a(g)

A. Description of Requests for Relief

The guidance in this enclosure is intended to illustrate the type and extent of information that is necessary for "request for relief" of items that cannot be fully examined to the requirements of Section XI of the ASME Code. The preservice/inservice inspection program should identify the examination and pressure testing requirements of the applicable portion of Section XI that are deemed impractical because of the limitation of design, geometry, radiation considerations or materials of construction of the components. The request for relief should provide the information requested in the following section of this appendix for the examinations and pressure tests identified above.

B. Request for Relief from Certain Examination and Testing Requirements

Many requests for relief from examination and/or testing requirements submitted by Applicants or Licensees have not been supported by adequate descriptive and detailed technical information. This detailed information is necessary to: (1) document the impracticality of the ASME Code requirements within the limitations of design, geometry, and materials of construction of components; and (2) determine whether the use of alternatives will provide an acceptable level of quality and safety.

Relief request(s) submitted with a justification such as "impractical", "inaccessible", or any other categorical basis, require additional information to permit an evaluation of that relief request. The objective of the guidance provided in this section is to illustrate the extent of the information that is required to make a proper evaluation and to adequately document the basis for granting the relief in the Safety Evaluation Report. Subsequent requests for additional information and delays in completing the review can be considerably reduced if this information is provided in the initial relief request submittal.

For each relief submitted, the following information should be included:

1. An identification of the component(s) and/or the examination requirement for which relief is requested.

2. The number of items associated with the request relief.

3. The ASME Code class.

4. An identification of the specific ASME Code requirement that has been determined to be impractical.

5. The information to support the determination that the requirement is impractical; i.e., state and explain the basis for requesting relief.

6. An identification of the alternative examinations that are proposed: (a) in lieu of the requirements of Section XI; or (b) to supplement examinations performed partially in compliance with the requirements of Section XI.

7. A description and justification of any changes expected in the overall level of plant safety by performing the proposed alternative examinations in lieu of the examination required by Section XI. If it is possible to perform alternate examinations, discuss the impact on the overall level of plant quality and safety.

For inservice inspection, provide the following additional information regarding the inspection frequency:

1. State when the request for relief would apply during the inspection period or interval (i.e., whether the request is to defer an examination).

2. State when the proposed alternative examinations will be implemented and performed.

3. State the time period for which the request for relief is needed.

Technical justification or data must be submitted to support the relief request. Opinions without substantiation that a change will not affect the quality level are unsatisfactory. If the relief is requested for inaccessibility, a detailed description or drawing which depicts the inaccessibility must accompany the request. A relief request is not required for examinations and/or tests prescribed in Section XI that do not apply to your facility. A statement of "N/A" (not applicable) or "None" will suffice.

C. Request for Relief for Radiation Considerations

Exposures of personnel to radiation to accomplish the examinations prescribed in Section XI of the ASME Code can be an important factor in determining whether, or under what conditions, an examination must be performed. A request for relief must be submitted in the manner described above for inaccessibility and must be subsequently approved by the NRC Staff.

Some of the radiation considerations will only be known at the time of the examination or test. However, from experience at operating facilities, the Applicant or Licensee generally is aware of those areas where relief will be necessary and should submit as a minimum, the following information with the request for relief:

1. The total estimated man-rem exposure involved in the examination or test.

2. The radiation levels at the examination or test area.

3. Flushing or shielding capabilities which might reduce radiation levels.

4. A proposal for alternate examination techniques.

5. A discussion of the considerations involved in remote examinations.

6. Similar welds in redundant systems or similar welds in the same systems which can be examined.

7. The results of preservice examination and any inservice results for the welds for which the relief is being requested.

8. A discussion of the failure consequences of the weld which was not examined.

MATERIALS ENGINEERING BRANCH
251 COMPONENT INTEGRITY SECTION

Turbine Maintenance Commitment for the Limerick Turbine Missile Issue

The staff has reviewed the Limerick facility with regard to the turbine missile issue and concludes that the probability of unacceptable damage to safety-related systems and components due to turbine missiles is acceptably low (i.e., less than 10^{-7} per year) provided that the turbine missile generation probability is maintained to be 10^{-5} per reactor year or less for the life of the plant by an acceptable maintenance program. In reaching this conclusion, the staff has factored into consideration the unfavorable orientation of the turbine generator.

The staff considers the turbine missile issue as a confirmatory item if the applicant agrees to:

a) submit for NRC approval, within three years of obtaining an operating license, a turbine system maintenance program based on the manufacturer's calculations of missile generation probabilities, or

b) volumetrically inspect all low pressure turbine rotors at the second refueling outage and every other (alternate) refueling outage thereafter until a maintenance program is approved by the staff, and

c) conduct turbine steam valve maintenance, (following initiation of power output) in accordance with present NRC recommendations as stated in SRP Section 10.2 of NUREG-0800.

The applicant is requested to respond to this issue.

METEOROLOGY AND EFFLUENT TREATMENT BRANCH*
451 METEOROLOGY SECTION

1. Design Basis Tornado Characterisitics (2.3.1)

The characteristics of the design basis tornado considered by the applicant for the Limerick plant are different than the recommendations of Regulatory Guide 1.76, "Design Basis Tornado for Nuclear Power Plants." for this region of the country. In the response to question 451.6, the applicant describes a design basis tornado which assumes a 300 mph rotational velocity with a translational velocity of 60 mph. Although the total wind speed (360 mph) is equivalent to that recommended in Regulatory Guide 1.76, the applicant's methodology for determining resultant wind loading is questionable. The applicant is requested to specifically address deviations from the Regulatory Guide for total pressure drop or rate of pressure drop. This subject is being reviewed by the staff to determine the acceptability of the applicant's design of Category I structures with respect to design basis tornado characteristics and load combinations.

2. Local Meteorology, Onsite vs Offsite Precipitation Measurements (2.3.2)

Although annual precipitation in the area (Philadelphia, Reading, Graterford, and Phonexville) ranges from about 1015 mm (40 inches) to about 1090 mm (43 inches), onsite precipitation measurements for the 5-year period 1972-1976 indicated annual precipitation of about 1510 mm (59.5 inches). The applicant is requested to provide additional information to that provided in the response to question E450.5 which provides an analysis and discussion of the causes of these differences.

* The open items are numbered sequentially for each sections review. The numbers in parentheses refer to the applicable section of the SRP and forthcoming SER.

3. Atmospheric Stability Indicator for Emergency Response Actions (2.3.3)

During plant operation, the proximity of the cooling towers to Tower No. 1 could cause some distortion to airflow and affect measurements of wind speed and direction at Tower No. 1 when the wind is blowing from the cooling towers toward the meteorological tower (winds from the southeast and south-southeast). The turbulent wake of the cooling towers will probably not extend far enough to affect meteorological measurements during low wind speed (i.e., less than 2 m/sec) conditions. Meteorological measurements at Tower No. 1 will probably be affected by the cooling towers less than 10% of the time. Measured wind speeds could be reduced somewhat and measured wind direction could be more variable. Use of a stability indicator dependent on wind direction fluctuations could indicate more unstable conditions than would otherwise be estimated. However, the staff believes that the frequency of possible cooling tower wake effects is sufficiently small and that the potential for significant distortions of wind speed and direction measurements is also small, and, therefore, the location of Tower No. 1 is satisfactory.

This issue is not identified as an open item requiring an applicant response at this time. However, the staff does wish to note that because of the potential for misrepresenting atmospheric stability conditions, the staff will consider this possibility in its review of the proposed atmospheric stability indicator for emergency response actions.

4. Starting Threshold of Anemometers (2.3.3)

The applicant claims that the entire onsite meteorological measurements system complies with the accuracy specification presented in Regulatory Guide 1.23, "Onsite Meteorological Programs." However, the staff is concerned about the starting threshold of the anemometers and the characterization of the distribution of low wind speeds. The anemometers installed on Tower No. 1 have starting speeds of 0.8 m/sec (1.8 mph) compared with the starting speed of 0.45 m/sec (1.0 mph) recommended in Regulatory Guide 1.23. Almost 18% of the wind speeds at Limerick are below 0.8 m/sec, and, therefore, classified as calm. Because the actual wind speed and direction for calm conditions are unknown, wind speed and direction must be inferred when used in assessments of atmospheric dispersion characteristics. The applicant argues that the stopping speed of the anemometer (about 0.3 m/sec) permits determination of an average wind speed less than 0.45 m/sec.

Because the existing anemometers will not be capable of indicating airflow conditions about 20% of the time, the staff takes the position that a more sensitive anemometer should be installed at the 9.1 m level of Tower No. 1 for use during plant operation.

5. Meteorological Measurements During Plant Operation (2.3.3)

The meteorological measurements program during plant operation is planned (see response to question 451.10) to include Tower No. 1, a backup tower located about 120 m away, and the Satellite tower. It is proposed that existing measurements and instrumentation will continue during the operational program, with the exception of a change from measurement of relative humidity to a measurement of dew point temperature as part of "Weather Station No. 1." Meteorological information is planned to be displayed on strip charts in the control room. All parameters measured at the various meteorological towers included as part of the operational program are planned to be available on strip charts in the control room. Meteorological data will also be included as part of the Radiation and Meteorological Monitoring System (RMMS) in the Technical Support Center (TSC). Data from this system will be displayed on a CRT in the control room and Emergency Operations Facility (EOF).

The operational meteorological program described above appears to meet a portion of the criteria for upgraded meteorological measurements as part of the emergency response capability. However, the applicant will be required to completely upgrade the operational meteorological measurements program to meet the criteria in NUREG-0654, Appendix 2, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." The upgrades must be in accordance with the schedule of NUREG-0737, III.A.2, "Clarification of TMI Action Plan Requirements," and its supplement. The incorporation of current meteorological information into a real-time atmospheric dispersion model for dose assessments will also be considered as part of the upgraded capability.

In addition to the issues discussed above, the staff has identified the following items relevant to the meteorological measurements review.

1. A description of the instrumentation proposed for the backup meteorological measurements program is requested.

2. The staff is continuing its review of the details of the display of the meteorological information in the control room, TSC and the EOF.

3. The onsite meteorological data which will be made available through remote interrogation should be identified.

4. The applicant will be requested to demonstrate the capability to maintain adequate (i.e., greater than 90%) data recovery during plant operation.

REQUEST FOR ADDITIONAL INFORMATION
METEOROLOGY

451.14 Your response to question 410.85 is not complete in that no analysis of diesel generator or residual heat removal service water pump failures at 106°F is provided. An ambient temperature of 97°F for the HVAC systems will be exceeded at least for one hour every two years, on the average. An ambient temperature of about 108°F will be exceeded at least for one hour every 100 years, on the average. These average return periods are based on analyses provided in NUREG/CR-1390, "Probability Estimates of Temperature Extremes for the Contigous United States." You stated that, on the average, hourly temperatures will equal or exceed 95°F, the design temperature, less than 30 hours per year, which means that the total hours of this temperature exceedance can be greater than 30 hours during a given year. Since the design temperature has a high probability of being exceeded, provide the following information:

(a) Provide analyses of the ambient temperatures and their durations at which the diesel generators and residual heat removal service water pumps would fail.

(b) Provide an evaluation of the probabilities of these failures.

(c) Provide an evaluation of the acceptability of these failure rates and the actions which will be taken to mitigate these failures, should a failure be imminent.

(d) Verify that any necessary equipment to mitigate these failures will be available onsite.

630 LICENSEE QUALIFICATION BRANCH
MANAGEMENT TECHNOLOGY SECTION - OPEN ITEMS

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

2. Identify the positions (AO's, RO's, etc.) that will fill the fire brigade.

3. ISEG information (question 630.10 and 630.29) submitted in revision 18 & 19 is under review.

4. The procedures requested in question 630.25 will be reviewed when received.

5. Q630.32 can't be closed out until the staff receives either (a) the written procedures for feedback of operating information or (b) a more detailed discussion of how feedback is accomplished.

    For example, what group is the "notepad coordinator" in? How does Operations Engineer get the information whose dissemination is his responsibility? How does OEAG get information to evaluate?

PERSONNEL QUALIFICATIONS SECTION - OPEN ITEMS

1. Licensed Operator Requalification Training Program (13.1.2)

A comprehensive requalification 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 Principle 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.

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

The applicant has indicated in the response to question 630.17, 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 responsibilites. 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.

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

The applicant indicates in the response to question 630.17 that the training program for mitigating core damage will be provided to the NRC prior to fuel loading. The program should be provided sufficiently in advance of fuel loading to allow for review and approval prior to fuel loading.