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January 12, 1984

Dr. Thomas E. Murley
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

SUSQUEHANNA STEAM ELECTRIC STATION
INTERIM REPORT OF A DEFICIENCY INVOLVING
CLAMPS ON CRD INSERT/WITHDRAW LINES
ERs 100450/100508 FILE 821-10
PLA-2033

Reference: PLA-2025 dated 1/3/84

Dear Dr. Murley:

This letter serves to provide the Commission with an interim report on a deficiency involving inadequate restraint provided by clamps on Control Rod Drive (CRD) insert/withdraw lines. This deficiency was originally reported by telephone to Mr. E. C. McCabe of NRC Region I on 12/9/83 by Mr. J. Saranga of PP&L as potentially reportable under the requirements of 10CFR50.55(e) for SSES Unit II.

The attachment to this letter contains a description of the deficiency, its cause, safety impact and current corrective action plan. PP&L anticipates providing the Commission with a final report, including the final corrective action, prior to Unit II fuel load.

Since the details of this report provide information relevant to the reporting requirements of 10CFR21 for Unit 2, this correspondence is considered to also discharge any formal responsibility PP&L may have in compliance thereto.

This issue was reported for Unit I in PLA-2025 (LER 83-164).

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We trust the Commission will find this report to be satisfactory.

Very truly yours,

B. Kenyon for

N. W. Curtis
Vice President-Engineering & Construction-Nuclear

JS:sab

js/lta29a

Attachment

Copy to:
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SSES PLA-2033
ERs 100450/100508 File 821-10
Dr. Thomas E. Murley

INTERIM REPORT

1.0 Subject

Clamps on Control Rod Drive (CRD) Insert/Withdraw Lines at inner reactor pedestal support do not provide the axial restraint required by the design stress calculation.

2.0 Description of Deficiency

The issues and events which lead to the identification of this condition are as follows:

- The original Unit I design required axial restraint on the insert/withdraw lines and this was to be provided by band-type clamps on the CRD housing.

- After installation of the Unit I piping, it was observed that the housing clamps did not always "mate-up", i.e., the piping was not axially restrained at this point. Subsequently, informal tests at the plant indicated that clamps that did initially mate-up also had a tendency to eventually relax so that the axial restraint was lost.

- To resolve this problem, it was decided to change the UNISTRUT clamps at the inner pedestal support from 2-way (guides) to 3-way type clamps (axial restraints). This was accomplished by specifying a 90 mil shim under the ears of the pipe clamp and, as required, 31 mil shims under the pipe to effect a tight fit.

- The above change was made to the Unit I drawings and issued to the field for installation on Unit I.

- For Unit II, separate drawings were issued. While these drawings specify the 90 mil shim for the inner pedestal support clamps, no mention is made of the optional 31 mil shim under the pipe or any requirement for a tight fit.

o While investigating the system's capability to withstand the newly defined waterhammer loads ("Fast Scram" Hydro-dynamic Loads on Control Rod Drive Systems), the existing design was reviewed and laboratory tests were performed on various shimming arrangements to quantify their axial restraint capacity. It was at this time that the disparity between the Unit I and II drawings was noticed; further testing showed that, particularly in the case of the 3/4" withdrawal lines, adequate axial restraint was in question for non-waterhammer loads. However, these tests do not represent actual in-plant conditions since 93 mil rather than 90 mil shims were used, and the as-built conditions of the pipes are not precisely orthogonal to the clamps. Nevertheless, the axial restraint required by the stress report is not believed to exist in the as-built configuration.

Presently, the lack of axial restraint for meeting stress report loadings is limited only to the CRD insert/withdraw lines at the inner reactor pedestal supports. This results in overstressing of the insert/withdraw lines above code allowables, but not above the pipe yield point. The main area of concern is at the CRD housing flange and the insert/withdraw line riser which connect to the flange.

3.0 Cause of Deficiency

The basic error appears to be that the pipe clamp requirements on the Unit I and II drawings do not assure that the required axial restraint assumed in the stress report was actually achieved in the installation. UNISTRUT specifies the axial restraint will be achieved for a configuration using no shims under the ears of the clamp. Since both the Unit I and II arrangements differ from UNISTRUT specifications, some substantiation, such as testing should have been developed to support the design provided.

4.0 Safety Implications

The lack of adequate axial restraint at the inner pedestal support results in overstress of the insert/withdrawal lines above the code allowables, but does not result in failure of the pipe due to overstress. This overstress only occurs during a scram and is most severe when combined with seismic and annulus pressurization loads. Also, the loading is dependent upon pipe geometry, therefore, as a result of the different geometry of each CRD line, catastrophic failure of all CRD insert/withdraw lines simultaneously is highly unlikely. However, if pipe failure could occur it would only affect the ability to scram at reactor pressure less than 500 psig. This is due to the fact that the reactor can be scrammed

4.0 Safety Implications (Continued)

on reactor pressure alone above 500 psig. Below 500 psig, accumulator pressure is required to scram the reactor and if an insert line is ruptured, it would not be possible to provide accumulator pressure to the control rod. However, since the existing computer analysis indicates that pipe failure will not occur, there are no safety concerns.

5.0 Corrective Action

PP&L is presently engaged in efforts to resolve this issue. These efforts include:

- o a design modification to the pedestal support which would provide the necessary axial restraint.

- o performing complete analysis to determine what possible effects the lack of restraint may have had on the system.