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Docket No. 50-346  
License No. NPF-3  
Serial No. 1-201  
May 22, 1981



RICHARD P. CROUSE  
Vice President  
Nuclear  
14191 259-5221



Mr. James G. Keppler  
Regional Director, Region III  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

IE Bulletin No. 79-14, dated July 2, 1979, requested that we develop and implement an inspection program to verify that the Davis-Besse Nuclear Power Station, Unit No. 1, seismic analysis input of safety related piping systems conforms to the actual field conditions.

On June 30, 1980, we reported to you the results of our detailed engineering reviews for normally inaccessible safety related piping. As part of that submittal, we transmitted our schedule for follow-on analytical work required under Item No. 4B of the Bulletin. On February 13, 1981, we submitted a revised schedule for the above follow-on analytical work. Attached is a description of the results of our follow-on analysis of the identified discrepancies for normally inaccessible safety related piping in accordance with Item No. 4B of the Bulletin.

Yours very truly,

*R.P. Crouse / ual*

RPC:CLM

Attachment

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cc:

U.S. Nuclear Regulatory Commission  
Office of Inspection and Enforcement  
Division of Reactor Operation Inspection  
Washington, D.C. 20555

U.S. Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation  
Division of Operating Reactors  
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NRC Davis-Besse Resident Inspector

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Docket No. 50-346  
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Seismic Analysis For As-Built  
Safety Related Piping Systems

Response to NRC IE Bulletin No. 79-14

Davis-Besse Nuclear Power Station Unit 1

I. INTRODUCTION

NRC IE Bulletin 79-14, dated July 2, 1979, Revision 1, dated July 18, 1979, Supplement 1, dated August 15, 1979, and Supplement 2, dated September 7, 1979, required all power reactor facility licensees to verify that the seismic analysis of safety-related piping systems applies to the actual as-built configuration of systems. The action items identified in the Bulletin apply to all safety-related piping, 2-1/2 inches in diameter and greater, and to Seismic Category I piping, regardless of size, which was analyzed by computer.

The response to Item 1 of the Bulletin was submitted on August 1, 1979 (Serial No. 1-81). A response to Item 2 of the Bulletin was submitted on October 1, 1979 and October 19, 1979 (Serial Nos. 1-93 and 1-95). A partial response to Item 4 covering the normally accessible piping was submitted on June 16, 1980 (Serial No. 1-137). A complete response to Item 3 was submitted on June 30, 1980 (Serial No. 1-146).

This report provides the final response to Item 4 of the Bulletin, describing the results of the normally inaccessible piping stress reanalysis incorporating the as-built configuration of the piping and support systems.

II. Review of Inspection and Results

Inspection of all normally inaccessible safety-related piping and the remaining normally accessible safety-related piping not covered by our responses dated October 1, 1979 and October 19, 1979, due to operating conditions, began on April 14, 1980 and was completed on May 21, 1980. Clearances for all whip restraints on inaccessible piping were checked during the 1980 refueling outage and have been found to have no affect on the stress analysis. Preliminary evaluation and detailed engineering reviews were completed in accordance with Supplements 1 and 2 of the Bulletin. Discrepancies identified by both the inspection team and the stress analyst were tabulated and shown in Attachment 1 to the June 30, 1980 submittal. Evaluation of the preliminary two day reviews indicated that none of the noted nonconformances would adversely affect system operability. The detailed engineering review of all discrepancies, both those identified in the field and any subsequently identified in the office, indicated two deviations which caused an overstressed condition in the piping system and for which system operability may have been affected. Since additional stress analyses beyond the 30 day evaluation were required to determine the affect on system operability and the unit was in a refueling outage, these items were corrected prior to restart of the unit. These two deviations were summarized in the June 30, 1980 response.

### III. Description of Stress Reanalysis and Results

In Attachment I to the June 30, 1980 submittal, it was anticipated that 44 of the 139 original stress calculations would require complete computer reanalysis. An additional 61 of the 139 stress calculations were to require a simple hand calculation to resolve the discrepancies, and 34 calculations did not require any piping reanalysis. During the course of the reanalysis effort, a number of stress calculations were re-evaluated by the stress analyst based on the results of the calculations performed thus far and it was determined that a more extensive computer analysis would be required. As a result, the reanalysis consisted of a total of 76 stress calculations which were completely computer reanalyzed, an additional 33 stress calculations which were resolved by means of a simple hand calculation, and 30 calculations which required no reanalysis.

None of the 109 stress calculations reanalyzed required the rerouting of any piping. A few of the reanalyzed stress calculations did require the addition or relocation of a support. However, the vast majority of the stress calculations, that were reanalyzed, only revised the calculated load transmitted to the existing supports.

### IV. Support Reanalysis and Modifications

Pipe supports/anchors on the inaccessible safety-related piping, as defined by the bulletin, were reanalyzed for two different reasons. The piping system stress calculation reanalysis generated revised support loads that were higher than the original design loads or the inspection identified discrepancies that existed between the design drawings and the as-built configuration. In the first case, the supports were reanalyzed for the higher loads and, in the latter, a reanalysis was performed to verify the adequacy of the support.

Both of these cases combined have generated structural reanalysis for a total of approximately 300 supports and anchors out of the total of 1500 on the inaccessible piping. Of this 300, approximately 45 supports/anchors have been identified as requiring some modification to the structure to either return it to its design condition or to modify it to accommodate its new loading condition.

These modifications can be classified into the same three categories that were used to describe the modification for the accessible area supports/anchors:

1. a minor revision
2. a moderate change or addition, and
3. a major structural rework or complete redesign of the support.

Typically, minor revisions consist of the resetting of a spring or the addition of a small stiffener or shim plate. Such minor modifications comprise approximately 42 percent of the total number of support modifications for the inaccessible areas.

The moderate change or addition includes, for example, the replacement of a structural member or the addition of a brace or kicker to the support structure. Modifications in this category would not require the complete dismantling of the support but would rather affect only a portion of the structure. Approximately 56 percent of the support modifications fall in this category.

The addition of a pipe support/anchor or the redesign or relocation of the entire support is considered a major modification. Only one of the forty-five modifications falls into this category.

V. Schedule for Completion of Support Modifications

As stated previously, approximately 45 pipe supports/anchors have been identified as requiring some modification to the structure. These design modifications are currently in some stage of the engineering design cycle. The work packages are being given expeditious treatment and the projected completion date for issue of the last package is July 1, 1981.

Since these support modifications are located in normally inaccessible areas of the station, work will be performed during the next scheduled refueling outage.

VI. Schedule for Issue of As-Built Drawings

The current schedule for completion of as-built drawings incorporating the inspection findings for piping supports/anchors located on inaccessible safety-related piping is December 1, 1981.

As-built drawings reflecting the forty-five modifications performed during the refueling outage will be issued by December 1, 1982.

VII. Conclusions

IE Bulletin 79-14 inspection of the normally inaccessible piping did uncover minor discrepancies between the design and the as-built configuration of the piping and supporting systems. The affect of these discrepancies has been evaluated in detail and the preliminary conclusions made in our June 30, 1980 response are still valid, that no deficiency has been discovered that would have adversely affected the operability of any safety-related system.