



Commonwealth Edison
Dresden Nuclear Power Station
R.R. #1
Morris, Illinois 60450
Telephone 815/942-2920

November 4, 1992

CWS LTR #92-641

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Licensee Event Report 92-29-01, Docket 050237 is being submitted to provide additional information with regard to the root cause for this event.

Charles W. Schroeder
Station Manager
Dresden Nuclear Power Station

CWS/glt

Enclosure

cc: A. Bert Davis, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

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(ZDVR/771)

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Dresden Nuclear Power Station, Unit 2 Docket Number (2) 0 5 0 0 0 2 3 7 Page (3) 1 of 0 5

Title (4) Bellows at Primary Containment Penetration X-125 Found Outside FSAR Design Limits Due to Project Instruction Deficiencies

Event Date (5)			LER Number (6)				Report Date (7)			Other Facilities Involved (8)										
Month	Day	Year	Year	Sequential Number	Revision Number	Month	Day	Year	Facility Names	Docket Number(s)										
0	8	2	8	9	2	9	2	0	2	9	0	1	0	9	1	8	9	2	Dresden Unit 3	0 5 0 0 0 2 4 9

OPERATING MODE (9) N

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)

POWER LEVEL (10) 0 8 7	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> Other (Specify in Abstract below and in Text)
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name: Ronald R. Skoglund, Technical Staff System Engineer Ext. 2543

TELEPHONE NUMBER: AREA CODE 8 1 5 9 4 2 2 9 2 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

Expected Submission Date (15) Month Day Year

Yes (If yes, complete EXPECTED SUBMISSION DATE) X NO

ABSTRACT (Limit to 1400 spaces, i.e, approximately fifteen single-space typewritten lines) (16)

At 1400 hours on August 28, 1992, with Unit 2 at 86.8 percent power and Unit 3 at 86.1 percent power, an engineering evaluation determined that the bellows assembly and piping at the drywell vent and purge containment penetration X-125 on both Unit 2 and Unit 3 is operable but outside the Final Safety Analysis Report (FSAR) design limits. Several preceding events led to the determination that the bellows were outside of the FSAR design limits. An engineering review was being performed for a modification to containment penetration X-125 on both units. A discrepancy between the analyzed configuration and the as-built configuration on the bellows elements for these penetrations was found. The analyzed configuration included a single ply bellows with tie-rod supports. The as-built configuration consists of a two ply bellows with no tie-rod supports. A Problem Identification Form (PIF) was written to document the discrepancy on August 21, 1992. An operability evaluation based on engineering judgement for Unit 2 and Unit 3 was performed by the Nuclear Engineering Department (NED) on August 25, 1992. After it was determined that the piping was outside the FSAR design limits, NED made recommendations to bring the piping back within the FSAR design limits by replacing the X-125 bellows assemblies during upcoming refueling outages. The Safety Significance of this event is minimal since the bellows meet operability requirements. This event is the first occurrence where a bellows on a primary containment penetration was found outside FSAR design limits.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2527 Mwt rated core thermal power

Nuclear Tracking System (NTS) tracking code numbers are identified in the text as (XXX-XXX-XX-XXXXX)

EVENT IDENTIFICATION:

Bellows at Primary Containment Penetration X-125 Found Outside FSAR Design Limits Due to Project Instruction Deficiencies

A. CONDITIONS PRIOR TO EVENT:

Unit(s): 2(3) Event Date: August 28, 1992 Event Time: 1400 Hours
 Reactor Mode(s): N(N) Mode Name(s): Run(Run) Power Level(s): 86.8(86.1)%
 Reactor Coolant System (RCS) Pressure(s): 988(984) psig

B. DESCRIPTION OF EVENT:

At 1400 hours on August 28, 1992, with Unit 2 at 86.8 percent power and Unit 3 at 86.1 percent power, an evaluation performed by the Nuclear Engineering Department (NED) determined that the bellows assembly and piping at the drywell vent and purge primary containment penetration X-125 on Unit 2 and Unit 3 were operable but outside the Final Safety Analysis (FSAR) design limits. On August 21, 1992, an engineering review for a modification found a discrepancy between the as-built configuration of the bellows and the configuration used in calculating the FSAR design limits. An operability evaluation based on engineering judgement for Unit 2 and Unit 3 was performed by NED on August 25, 1992. Engineering recommendations for resolving this issue were given to the station on September 4, 1992.

C. APPARENT CAUSE OF EVENT:

This report is submitted in accordance with 10 CFR 50.73(a)(2)(ii), which requires the reporting of any condition that is outside the design basis of the plant, due to the bellows assembly and piping at drywell vent and purge primary containment penetration X-125 on Unit 2 and Unit 3 being found outside FSAR design limits.

The root cause of the X-125 bellows being found outside FSAR design limits has been determined to be deficiencies in the Project Instruction that were used to perform the original piping calculations. An incorrect modeling assumption was used for the configuration of the in-line expansion bellows in the piping system at Primary Containment penetration X-125. The bellows were modeled as tied single bellows instead of the as-built conditions which are untied tandem bellows.

The single vs tandem error in the bellows modeling is a result of a misunderstanding by the piping analysts as to how bellows are modeled. As-built drawings were not available for Dresden's bellows and walkdown data at the time of the piping analysis showed that the as-built bellows were tandem bellows.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT Energy Industry Identification System (EIS) codes are identified in the text as [XX]

An assumption was made when modeling the bellows by the piping analyst to input the dimensions and stiffness of the tandem bellows but perform the rest of the model as if the bellows were a single bellows. This modeling assumption eliminated a degree of freedom from the analysis and significantly changed the stress loading on the piping. The tied vs untied error was a result of inadequate walkdown information. The piping analyst made an assumption while performing the piping calculation that the X-125 bellows are tied bellows. Both of these errors which led to the improper modeling of the X-125 bellows can be traced back to insufficient knowledge on the piping analysts part with respect to the analytical modeling of in-line bellows. Since the analysts rely on the Project Instructions for technical guidance, the root cause of both problems is the result of deficiencies in the original Project Instructions.

D. SAFETY ANALYSIS OF EVENT:

The primary containment penetrations and their bellows assemblies are part of the primary containment boundary. The purpose of the bellows assemblies is to allow for thermal expansion of the process pipe during heatup and system operation. Most penetrations consist of a penetration sleeve, guard pipe, process pipe, bellows assembly, and a flued head anchor (Figure 1). The X-125 penetration only consists of a process pipe and a bellows assembly with the bellows assembly as an integral part of the process pipe (Figure 2). Even though the as-built configuration of the bellows is outside the FSAR design limits, the bellows has been determined to be operable. Therefore, the safety significance of this event is minimal.

E. CORRECTIVE ACTIONS:

The immediate corrective actions taken were for NED to evaluate the X-125 bellows for operability and determine if the unanalyzed as-built configuration fell within the FSAR design limits. When the existing bellows were found outside of the FSAR design limits, additional corrective actions became necessary. The Technical Staff will be responsible for replacing the bellows assemblies for X-125 with ones that meet the design limits of the FSAR. These replacements are currently scheduled for D2R13 and D3R13 (237-200-92-19003). In addition, NED should verify that the AE who performed the original piping analysis revises its generic piping analyses procedure to address the type of as-built information required and proper modeling techniques for in-line bellows by January 15, 1993 (237-200-92-19004). The analysis for penetrations with similar bellows assemblies were reviewed for their accuracy. No problems with any of these analyses were found.

F. PREVIOUS OCCURENCES:

No previous occurrences involving a bellows on a primary containment penetration being outside the FSAR design limits was found during a review of past reportable events on the primary containment system.

G. COMPONENT FAILURE DATA:

A component failure did not occur during this event.

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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

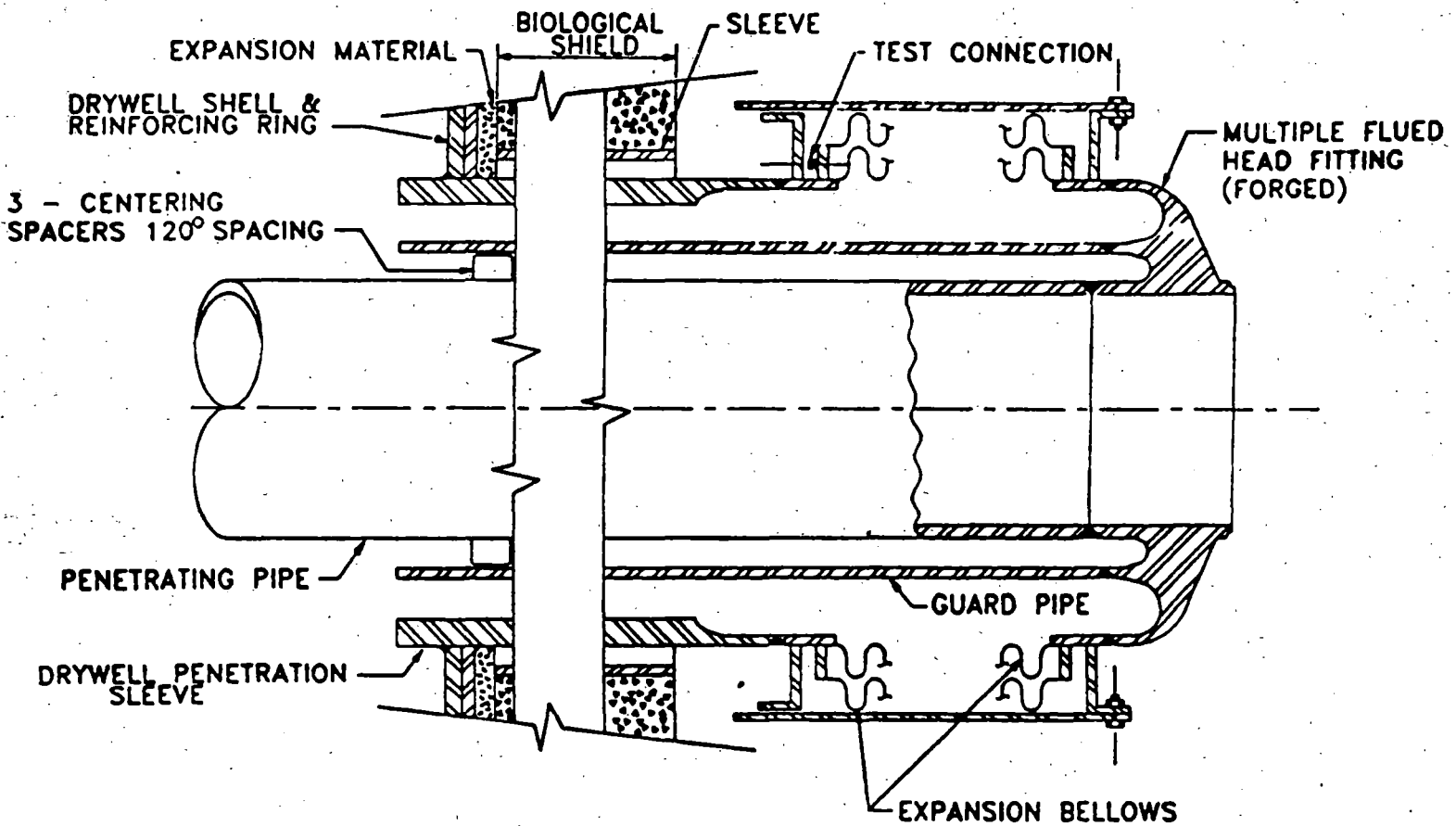


Figure 1

Configuration of Most Penetrations

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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

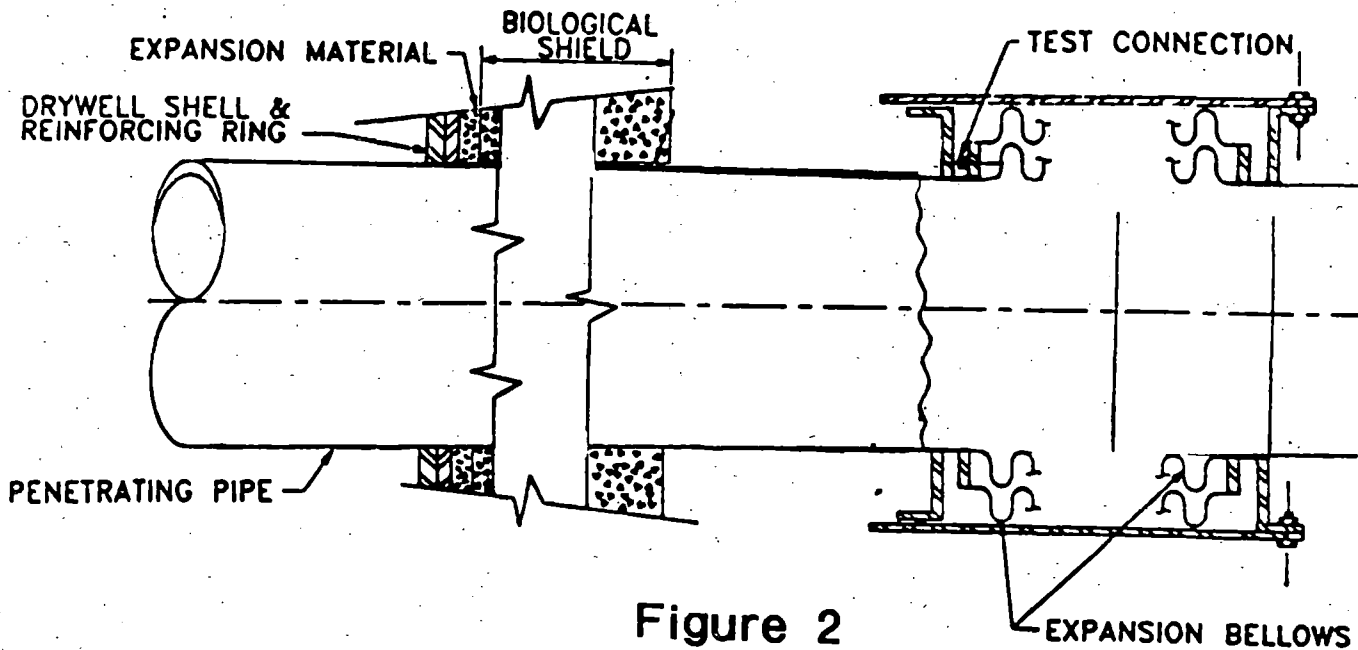


Figure 2

Configuration of X-125