



**Consumers  
Power**

**POWERING  
MICHIGAN'S PROGRESS**

Palisades Nuclear Plant: 27780 Blue Star Memorial Highway, Covert, MI 49043

**David W. Rogers**  
*Plant Safety and Licensing Director*

September 30, 1993

Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

**DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT - SAFETY RELATED PIPING  
REVERIFICATION PROJECT - PERIODIC STATUS - SEPTEMBER 1993**

A meeting was held at NRC Headquarters on January 22, 1992 to discuss the Safety Related Piping Reverification Project (SRPRP). As documented in your February 13, 1992 letter, we committed to submit a status report for the SRPRP approximately every eight months. Consumers Power Company's letter, dated October 30, 1992, provided the first of the periodic status reports.

Because the next eight month period was scheduled to coincide with the end of the 1993 refueling outage and to give us time to incorporate the results of the work completed during the outage, we revised our schedule for submitting the second status report to the end of the 1993 refueling outage. Enclosed is the second status report.

It has become apparent that status reports are more appropriately tied to the results of the work completed during refueling outages. Reports of the status following the refueling outages will replace the originally committed submittal of the status reports at approximately every eight month intervals.

Accordingly, we are changing our commitment to submit status reports every eight months and instead will submit status reports following our refueling outages until we have completed our planned actions.

David W Rogers  
Plant Safety and Licensing Director

CC: Administrator, Region III, USNRC  
Resident Inspector - Palisades

Enclosure

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ENCLOSURE

Consumers Power Company  
Palisades Plant  
Docket 50-255

SAFETY RELATED PIPING REVERIFICATION PROJECT  
PERIODIC STATUS  
SEPTEMBER 1993

September 30, 1993

**SAFETY RELATED PIPING REVERIFICATION PROGRAM  
PERIODIC STATUS - SEPTEMBER 1993**

Introduction

The Safety Related Piping Reverification Program (SRPRP) was initiated to reverify the seismic design adequacy of large bore (> 2" nominal diameter) piping systems. The scope consists of physical walkdowns of accessible piping and pipe supports, performance of analyses for both piping and supports to current design criteria, and implementation of required modifications.

The purpose of this report is to summarize the results of the recently completed Phases IIA and IIB of the program and to identify future program direction.

Scope

Phase I of the program consisted of reverification of 18 piping stress packages containing approximately 300 pipe supports. Phase I was completed as of October 1992 (CPCo letter to NRC dated October 30, 1992).

Phases IIA and IIB consisted of reverification of 13 piping packages containing 271 supports. Attachment A summarizes the Phase IIA and IIB stress package scope. Walkdowns were initiated in February 1992. Analytical work and installation of required modifications were complete as of September 10, 1993.

Due to changes in design criteria subsequent to Phase I, three stress packages from Phase I were identified as requiring reanalysis in conjunction with Phase IIA work. No modifications were necessary as a result of the reanalysis of these three packages. The changes in design criteria were agreed to between Consumers Power Company (CPCo) and the NRC as a result of an NRC Special Team Inspection performed in 1991 (IR 91-202, dated August 2, 1991). These criteria became the basis for the SRPRP.

Current program as-built walkdown requirements include:

- Visual verification of piping configuration; location of pipe supports and wall and floor penetrations; and unidentified and unintentional restraints
- Detailed measurement and verification of pipe support attributes, including member lengths, size and configuration of welds, gaps, spring hanger settings, etc.

### Results - Phase IIA and IIB

A total of 37 modifications resulted from the Phase IIA and IIB scope. Only 3 of the modifications were inside containment. Nearly all outside containment modifications were completed prior to the start of the 1993 refueling outage. All remaining modification were completed during the refueling outage.

The exhibits provided in Attachment B summarize the reasons, root causes and root cause categories associated with the Phase IIA and IIB modifications.

Analyses have shown that, to date, no piping system has exceeded the interim operability criteria which were submitted to the NRC staff on November 22, 1989.

### Trending

At the completion of both Phases I, IIA and IIB, trending studies were performed and documented. Based on root cause analyses of as-built and design discrepancies, the trending studies provide a basis for refocusing of requirements and processes for future program phases.

The exhibits contained in Attachment B show that nearly all of the Phase IIA and IIB modifications were due to design criteria changes (i.e., response spectra peak broadening, use of Regulatory Guide 1.60 spectra, localized effects due to integral welded attachments to pipe, relative seismic movements between buildings, etc.) and errors in previous analyses. As-built discrepancies by themselves did not lead to modifications. These results are consistent with Phase I trending.

Based on the trending results to date, a refocusing of the walkdown process is warranted. On the basis that as-built discrepancies have not led to modifications, a revised walkdown process will be implemented which will allow less rigorous inspections of selected pipe support attributes. Specifically, there will be no walkdown requirement to take precise readings of spring hanger load indicators and exact measurements of support member lengths, weld size and gaps. This is based on the results of all pipe supports analyzed to date (about 40% of the total number of supports in the program).

The current visual inspection criteria for piping configuration verification will remain unchanged. Likewise, current requirements for pipe support inspections for missing and loose fasteners will continue as required per the Pipe Support Preventive Maintenance Program.

### Future Program Direction

- As discussed above, the SRPRP walkdown process will be changed to incorporate revised inspection requirements for pipe supports. Implementation of the revised process will be in conjunction with the

start of Phase IID walkdowns in November 1993. Phase IIC walkdowns will continue to be performed to the current requirements.

- The scope and scheduled completion dates for Phases IIC and IID are shown in Attachment C. Phase IIC walkdowns are ahead of schedule and the modifications are to be completed by the end of the 1995 refueling outage. Remaining work will be performed on a continuing basis and all SRPRP modification work is scheduled to be completed by the end of the 1996 refueling outage. Our current assessment is that the program will be completed ahead of schedule.
- The results of Phase IIC and Phase IID will be forwarded to the NRC after the completion of the 1995 and 1996 refueling outage.

**Attachment A**

**Consumers Power Company  
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**PHASE IIA/B SCOPE SUMMARY**

**September 30, 1993**

PHASE IIA/B SCOPE SUMMARY

PHASE	STRESS PACKAGE	SYSTEM	I/O*	NO. OF SUPPTS
IIA	03320	Safety Injection, Containment Spray & Shutdown Cooling	0	63
IIA	03325	SFP Cooling Pump Discharge	0	73
IIA	03382	Service Water	I	3
IIA	03383	Service Water	I	3
IIA	03384	Service Water	I	3
IIA	03385	Service Water	I	3
IIA	03386	Service Water	I	32
IIA	03387	Service Water	I	27
IIA	05901	AFW Pump Suction	0	1
IIA	05902	AFW Pump Suction	0	4
IIA:	10			212
IIB	03312	Component Cooling Water	0	33
IIB	03313	Component Cooling Water	0	7
IIB	03316	Service Water	0	19
IIB:	3			59
<b>Totals</b>	<b>13</b>	<b>Stress Packages</b>		<b>271</b> <b>Supports</b>

\* Inside/Outside containment

**Attachment B**

**Consumers Power Company  
Palisades Plant  
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**MATRIX SUMMARY OF MODIFICATION ROOT CAUSES  
(Exhibit 5)**

**MATRIX SUMMARY OF ROOT CAUSE CATEGORIES  
(Exhibit 6)**

**September 30, 1993**



EXHIBIT 5 - MATRIX SUMMARY OF MODIFICATION ROOT CAUSES

ITEM NO.	ROOT CAUSE	STRESS PACKAGE													NO. OF OCCURRENCES BY ROOT CAUSE
		0 3 3 2 0	0 3 3 2 5	0 3 3 8 2	0 3 3 8 3	0 3 3 8 4	0 3 3 8 5	0 3 3 8 6	0 3 3 8 7	0 3 3 0 1	0 5 9 0 2	0 3 3 1 2	0 3 3 1 2	0 3 3 1 3	
1	REVISED SEISMIC CRITERIA	6	2						1			2			11
2	NEW SIFs	3													3
3	IWAs PREVIOUSLY NOT CONSIDERED	2	1												3
4	NEW THERMAL LOADING							1							1
5	ERROR IN PREVIOUS PIPING/ SUPPORT CALCULATION	4	2					1				1			8
6	INCOMPLETE PREVIOUS SUPPORT CALCULATION													1	1
7	INCOMPLETE PREVIOUS PIPING ANALYSIS	1	1												2
8	AS-BUILT DISCREPANCY PREVIOUSLY NOT EVALUATED	2							1			1			4
9	PREVIOUS CALCULATION NOT BASED ON LATEST LOADS	2										2			4
10	SAM PREVIOUSLY NOT CONSIDERED		1									2			3
11	DEFLECTION CHECK PREVIOUSLY NOT CONSIDERED		1												1
12	CURRENT CONFIGURATION PREVIOUSLY NOT ANALYZED	3													3
13	LOCAL CHECK PREVIOUSLY NOT REQUIRED											1			1
14	PREVIOUSLY SPECIFIED MOD NOT INSTALLED	1													1
15	UNIDENTIFIED SUPPORT	1													1
NO. OF OCCURENCES BY STRESS PACKAGE		25	8					1	3			9		1	47
NO. OF MODIFICATIONS		18	6					1	2			9		1	37



Attachment C

Consumers Power Company  
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LIST AND STATUS OF STRESS PACKAGES

September 30, 1993

Attachment C  
List and Status of Stress Packages

Phase I (Complete)

Stress Package

SP02502 <sup>+</sup>	Long Term Cooling
SP02503 <sup>+</sup>	Long Term Cooling
SP03342	Aux Feedwater Discharge
SP03356	Aux Feedwater Pump Suction
SP03359	Pressurizer Surge
SP03360*	Primary Loop Auxiliary Piping
SP03361	Pressurizer Spray
SP03362	LPSI to Primary Loop 1A
SP03363	LPSI to Primary Loop 1B
SP03364	LPSI to Primary Loop 2A
SP03365	LPSI to Primary Loop 2B
SP03366 <sup>+</sup>	HPSI to Primary Loop; Superseded by SP 02503
SP03367	HPSI to Primary Loop; Supersedes SP 06901
SP03368 <sup>+</sup>	Redundant HPSI; Superseded by SP 02502
SP03378	HPSI Piping Discharge
SP05101*	Auxiliary Feedwater Piping to Steam Generator E-50A
SP05102*	Auxiliary Feedwater Piping to Steam Generator E-50B
SP05903	Aux Feedwater Pump Suction
SP05904	Aux Feedwater Pump Discharge

\* Reanalyzed with Phase IIB Stress Packages

- + SP03366 and SP03368 have been merged with SP02502 and SP02503 for final analysis.

Phase IIA (Complete)

Stress Package

SP03320	Safety Injection, Cont Spray and Shutdown Cooling
SP03322	Safety Injection, Cont Spray and Shutdown Cooling
SP03325	SFP Cooling Pump Discharge to Spent Fuel Heat Exchangers
SP03382	Service Water From Eng Safeguard Cooler VHX-3
SP03383	Service Water to Eng Safeguard Cooler VHX-3
SP03384	Service Water From Eng Safeguard Cooler VHX-4
SP03385	Service Water to Eng Safeguard Cooler VHX-4
SP03386	Service Water to Eng Safeguard Cooler VHX-2
SP03387	Service Water From Eng Safeguard Coolers VHX-1, VHX-2, VHX-3 and VHX-4
SP05901	Aux Feedwater Pump Suction
SP05902	Aux Feedwater Pump Suction

Phase IIB (Complete)

Stress Package

SP03312	Component Cooling Water
SP03313	Component Cooling Water
SP03316	Service Water From Eng Safeguards

Phase IIC - 20 stress packages(To be completed by  
the end of the 1995  
Refueling Outage)

SP03311	Component Cooling Water
SP03314	Component Cooling Water Pumps Discharge
SP03315	Various Pump Sections
SP03317	Service Water to Eng Safeguards
SP03318	Service Water to Engineered Safeguards
SP03319	Safety Injection, Cont Spray and Shutdown Cooling
SP03340	Containment Sump Pumps
SP03341	Main Steam
SP03369	Containment Spray
SP03370	Containment Spray
SP03371	Main Feedwater "A" Steam Generator
SP03372	Main Feedwater "B" Steam Generator
SP03373	Main Steam System
SP03374	Main Steam System
SP03388	Spent Fuel Pool Cooling
SP03389	Reactor Cavity Drain and Recirc System
SP05401	Service Water Return from Condensing Unit VC-10
SP05402	Service Water Return to Condensing Unit VC-10
SP05403	Service Water from Condensing Unit VC-11
SP05404	Service Water to Condensing Unit VC-11

Phase IID - 26 stress packages(To be completed by the end  
of the 1996 Refueling Outage)

SP03375 has been moved from Phase I to Phase IID