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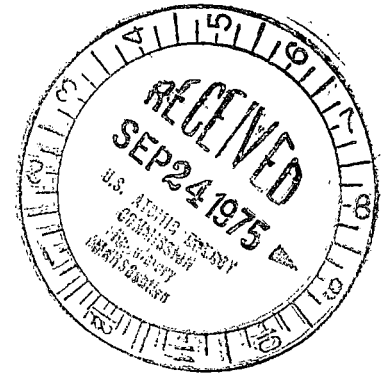
September 22, 1975

**Regulatory**

**File Cy**

Division of Reactor Licensing  
US Nuclear Regulatory Commission  
Washington, DC 20555

DOCKET 50-255, LICENSE DPR-20  
PALISADES PLANT

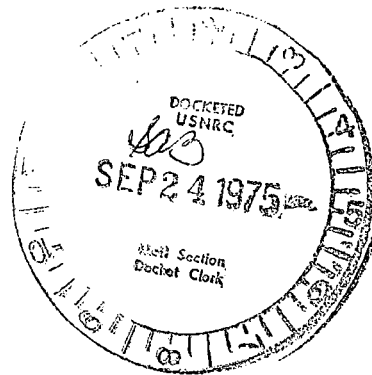


Attached are reports describing three abnormal occurrences that occurred at the Palisades Plant. These reports involve the failure of a valve associated with the HPSI system, the safety injection tanks less than 1720 ppm boron and incorrect release rates of liquid radwaste.

*Ralph B. Sewell*

Ralph B. Sewell  
Nuclear Licensing Administrator

CC: JGKeppler, USNRC  
File



10111

ABNORMAL OCCURRENCE REPORT  
Palisades Nuclear Plant

1. Report No: AO-21-75, Docket 50-255
- 2a. Report Date: September 22, 1975
- 2b. Occurrence Date: September 12, 1975
3. Facility: Palisades Nuclear Plant, Covert, Michigan
4. Identification of Occurrence: MOV-3007, high-pressure safety injection valve failed to pass fluid. This incident was identified as an abnormal occurrence by Technical Specifications 3.3.1 and 3.3.2. All other valves, piping and interlocks associated with (safety injection pumps) and required to function during accident conditions were operable.
5. Conditions Prior to Occurrence: The plant was operating at 48% power level and escalating power at 10% per day. The monthly safety injection bottle sampling had been in progress.
6. Description of Occurrence: At 2230 hours on September 12, 1975 "A" high-pressure safety injection pump was being used to refill the safety injection bottles after sampling. MOV-3007, although indicating open, would not pass borated water.
7. Designation of Apparent Cause of Occurrence: The apparent cause of the incident was a valve stem to valve disc separation. A visual observation of valve stem movement coupled with the inability to achieve flow is the basis of this conclusion.
8. Analysis of Occurrence: MOV-3007 and the associated high-pressure safety injection path was classified inoperable under Section 3.3.1g of the plant Technical Specifications. Section 3.3.2 provides up to 24 hours for resolution. Within this period, an extensive background search was made and a PRC meeting held to study the possibility of utilizing the redundant HPSI header by opening valves CV-3018 and -3036, and closing valves CV-3037 and -3039. This was considered within system design requirements by PRC and accomplished the next morning. The redundant HPSI header, which is not normally aligned for automatic actuation, provides full HPSI capability.
9. Corrective Action: The immediate corrective action taken was to place in service the redundant valve MOV-3068 and complete the filling operation of the safety injection bottle. Subsequent action taken was to verify the operability of and switch over to the redundant high-pressure safety injection system. Further investigation of the failed valve will be carried out to resolve whether a generic problem exists. Until then, the in-service HPSI valves will be either tested periodically or left open during operation.

10. Failure Data:

- a. MOV-3007 manufacturer is Velan Engineering Co and the part number is W8-376-13MS.
- b. The motor operator is manufactured by Philadelphia Gear Corp and the part number is SMB-00-15.
- c. A similar HPSI (MOV-3013) failed by disc-stem separation in January 1972.

ABNORMAL OCCURRENCE REPORT  
Palisades Nuclear Plant

1. Report No: A0-22-75, Docket 50-255
- 2a. Report Date: September 22, 1975
- 2b. Occurrence Date: September 12, 1975
3. Facility: Palisades Nuclear Plant, Covert, Michigan
4. Identification of Occurrence: Safety injection tanks less than 1720 ppm boron. This incident was identified as an abnormal occurrence by Technical Specifications 3.3.2(a).
5. Conditions Prior to Occurrence: The plant was operating at approximately 40%, increasing power. The monthly surveillance sampling of the SI tanks had started.
6. Description of Occurrence: On September 11, 1975, analysis of T-82A safety injection tank showed low boron (approximately 1690 ppm). This analysis was verified by several resamples. It was initially felt that this sample was contaminated with primary coolant boron (approximately 507 ppm) via leakage through SI injection line bleed-off valves. Several hours were spent performing spectral analysis of the primary coolant and SI tank sample. At 2155 hours on September 11, 1975, the SIRW tank was sampled with a resulting boron analysis of 1705 ppm. A review of the recent tank history indicated that on September 7, 1975 the tank (SIRW) had been at 1772 ppm boron. The only addition to the SIRW tank between September 7, 1975 and September 11, 1975 was a small volume of primary coolant (less than 5,000 gallons) at approximately 1000 ppm boron. 27,000 gallons of 1000 ppm boric acid would have been required to dilute the SIRW tank from 1772 to 1703 ppm. The SIRW tank was too full (98%) to possibly allow this, and was verified not to have been overfilled. Therefore, an actual change in concentration of the SIRW tank was seriously questioned.

During the next several hours, the procedure reagent chemicals used for the boron analysis were verified. Also, during this time, the boron concentration of the SIRW tank was increased by an addition of concentrated boric acid to approximately 1763 ppm, in the event sample analysis proved correct.

Following sample/analysis verification, the safety injection tanks were drained one at a time and refilled from the SIRW tank to boron concentrations greater than 1720 ppm.

7. Apparent Cause of Occurrence: The apparent cause of the occurrence was low boron concentration in the SIRW tank.

8. Analysis of Occurrence: The low concentration of boron in the safety injection tanks was due to their being filled or "topped off" from the SIRW tank. The cause of the low boron in the SIRW is felt to be poor mixing in that tank possibly due to design and/or temperature gradients.

The basis for Technical Specifications 3.3 states that the SIRW is assumed to contain 250,000 gallons of 1720 ppm boron water. At the time of the occurrence, the tank contained 270,000 gallons of 1700 ppm boron. The basis assumes boron requirements for a new core and 5% shutdown margin.

Based on the above and the fact that our core is approximately 2/3 "burned up," we concluded that no safety margins were exceeded.

9. Corrective Action: The following corrective actions were recommended by the Plant Review Committee to prevent recurrence of this occurrence:

- a. Modify the chemistry operating procedure to maintain the boron concentration in the SIRW tank between 1820 and 2000 ppm.
- b. Modify the chemistry operating procedures to maintain SI bottle boron greater than 1750 ppm.
- c. Conduct a review of the SIRW tank recirculation system.

As noted above, SIRW tank boron concentration was increased to 1763 ppm and the safety injection tanks were drained and refilled from the SIRW tank.

10. Failure Data: Not applicable.

ABNORMAL OCCURRENCE REPORT  
Palisades Nuclear Plant

1. Report No: AO-23-75, Docket 50-255
- 2a. Report Date: September 22, 1975
- 2b. Occurrence Date: August 28 and 29, 1975 (Identified September 12, 1975)
3. Facility: Palisades Nuclear Plant, Covert, Michigan
4. Identification of Occurrence: Incorrect release rate of liquid radwaste. This abnormal occurrence is defined by Technical Specifications 3.9.2: MPC, 10 CFR 20, Appendix B, Table II, Column 2, shall not be exceeded.
5. Conditions Prior to Occurrence: Plant was at 55% to 70% during power escalation.
6. Description of Occurrence: On September 12, 1975, the Plant Health Physicist, who does not routinely authorize radwaste batches, was asked to authorize a radwaste batch. In the course of his review, he discovered the release rate calculation was incorrect. The release rate was recalculated and the batch authorized. A review of past releases where the same technician was involved was instituted. Eighteen batch release rates were found to be incorrectly calculated. Two exceeded allowable release rate limits; one by 34% and the other by 62%.
7. Apparent Cause of Occurrence: The basic cause of the error was the release calculation form had different units for dilution flow than the procedure.

A technician, inexperienced in batch releases, was assigned to replace the regular technician who was on a two-week vacation. Instruction was given the new technician on the first two batch releases he calculated. These were done correctly. The technician proceeded to calculate batches using procedure RMC 4(c). The procedure calls for entering information on Form RMC 4(c)2. Among the information entered is identifying the dilution pumps in service and calculating the dilution flow in gpm. The Form RMC 4(c)2, however, has the units of lpm (liters per minute - circled on attached Form RMC 4(c)2). The technician filled in dilution flow in lpm to agree with the form. The procedure then calls for Form RMC 4(c)3 to be calculated. This will take approximately one hour to calculate. The procedure then calls for the activity release rate to be calculated in gpm by dividing the dilution flow rate by the sum of the MPC fractions. Due to the error on the form, the dilution flow was in liters per minute so the calculations were incorrect by a factor of +3.785 (the liters to gallons conversion). The Radiological Materials Control Supervisor reviewed and authorized the releases without catching the error. The RMC Supervisor reviewed the batches extensively because of the new technician for what he considered significant items, such as proper calculations, efficiencies, MPC fractions, etc.

8. Analysis of Occurrence: The increase in release did not cause any safety hazards to the environment. Releases over the entire period of concern were only 2.7% of 10 CFR 20 limits on an average basis.
9. Corrective Action: Radwaste Procedure 4(c) will be extensively reviewed to correct ambiguities and to be read easier. Corrected procedure will then be reviewed with all appropriate Health Physics personnel.

In addition to the immediate correction of this problem, an extensive review of remaining RMC procedures will be initiated. Emphasis will be placed on early completion consistent with the present plant administrative workload.

10. Failure Data: Not applicable.

TANK NO.	RECYCLE LEVEL %
TIME ON RECYCLE	
1 OPERATOR	DATE

SAMPLE - DATE		TIME	
pH (6.5-9.5)			
CONDUCTIVITY		umho/cm	
B	ppm	P	ppm
Cr	ppm	T.S.	ppm
	ppm		ppm
ETHER EXTRACTABLES		ppm	
GAMMA SPECTRUM NO.			
2 TECHNICIAN		DATE	

TANK VOLUME	E+	Liters
TANK MILLICURIES		mCi
TOT. PREVIOUS MILLICURIES		mCi
TOTAL MILLICURIES		mCi
TOTAL DILUTION WATER	E+	Liters
LIMIT FOR QUARTER (% of MPC)		
FRACTION OF QUARTERLY LIMIT		
PUMPS	D.W.	S.W.
DILUTION FLOW RATE	E+	lpm
2 MPC, FRACTIONS		
RADIATION ACTIVITY RELEASE RATE		
CHEMICAL RELEASE RATE		
ANAL FOR TANK TO BE RELEASED VERIFIED ( )		
3 TECHNICIAN		DATE

RELEASE AUTHORIZATION	
RELEASE RATE NOT TO EXCEED ( ) gpm	
WITH ( ) DILUTION WATER PUMPS AND ( ) SERVICE WATER PUMPS IN SERVICE.	
4 RMC. SUPV.	DATE

REMARKS:

\* RELEASE RATE BASED ON 10 CFR 20 LIMITS

BATCH	R
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PUMPS REQUIRED ( ) D.W. ( ) S.W.	
TANK RELEASE RATE	gpm
REMARKS:	
5 SHIFT SUPV.	DATE

GAMMA ACTIVITY	E	uCi/
RE- BACKGROUND		cpm
RE- ALARM SET POINT		cpm
6 OPERATOR	DATE	

TANK RECYCLE LEVEL	%
TANK RELEASE LEVEL	%
7 OPERATOR	DATE

D.W. PUMPS ( ) P-40A ( ) P-40B			
S.W. PUMPS ( ) P-7A ( ) P-7B ( ) P-7C			
	START	STOP	TOTAL
DATE			
TIME			Min
LEVEL			
GALLONS			Gal
RELEASE RATE INDICATED		gpm	
RELEASE RATE ACTUAL		gpm	
REMARKS:			
OPERATOR START			
8 OPERATOR STOP			

RELEASE REVIEWED BY	
S.S.	DATE
9 RMC SUPV.	DATE

CONTROLLED COPY



RMC' 4(C) 3

BATCH NO.

CONTROLLED COPY

NRC BHDA

CONSUMERS POWER COMPANY  
1945 WEST PARNALL RD  
JACKSON, MI  
TWX 517-787-1987  
9-16-75 3-25 PM

ATT- DIVISION OF REACTOR LICENSING  
USNRC - BETHESDA, MD

TO- J G KEPPLER, USNRC  
799 ROOSEVELT RD  
GLEN ELLYN, IL 60137

RE- DOCKET 50-255 LICENSE DPR-20

THIS IS TO CONFIRM OUR TELEPHONE NOTIFICATION TO K R BAKER OF AN  
EVENT WE HAVE CLASSIFIED AS AN ABNORMAL OCCURRENCE.

DURING THE PERIOD OF 8/16/75 TO 9/12/75, EIGHTEEN RADWASTE BATCH  
RELEASE RATES WERE INCORRECTLY CALCULATED. REVIEW OF THE RELEASES  
INDICATE THAT TWO BATCHES WERE OVER MPC LIMITS. BATCHES 75-052-R,  
8/28/75, AT 1.34 MPC AND 75-054-R, 8/29/75, AT 1.62 MPC VIOLATED  
TECH SPEC 3.9.2.

RELEASE RATE ERRORS WERE MADE BY FOLLOWING PROCEDURE RMC 4.C,  
STEP 2.4.1. THIS STEP DIVIDES THE DILUTION FLOW IN LITERS BY THE  
SUM OF THE MPC FRACTIONS. THE ANSWER IS ENTERED AS THE ACTIVITY  
RELEASE RATE WHICH HAS NO UNITS SPECIFIED ON THE CALCULATION FORM.  
THE PERSONNEL INVOLVED DID NOT CONVERT LITERS TO GALLONS. THE RMC  
SUPERVISOR REVIEWED AND AUTHORIZED ALL RELEASES WITHOUT NOTING THE  
ERROR. THE ERROR WAS DISCOVERED BY PALISADES PERSONNEL DURING A  
ROUTINE REVIEW.

THE ACTIVITY RELEASED DURING THE PERIOD WAS ONLY 26.9 PERCENT OF  
THE SPECIAL TECHNICAL SPECIFICATIONS LIMITS AND ONLY 2.69 PERCENT  
OF FEDERAL LIMITS /MPC/ ON AN AVERAGE BASIS. THE MPC LIMITS WERE  
EXCEEDED ONLY FOR TWO SHORT PERIODS OF TIME BETWEEN 8/16 AND  
9/12/75 AS THE MPC LIMITS DEFINE ACCEPTABLE CONTINUOUS DRINKING  
WATER CONCENTRATIONS AND APPLY TO WATER PRIOR TO DISCHARGE TO AND  
DILUTION IN LAKE MICHIGAN, IT IS CONCLUDED THAT THESE DISCHARGES  
HAD NO ADVERSE AFFECT ON THE PUBLIC HEALTH AND SAFETY.

RALPH B SEWELL  
NUCLEAR LICENSING ADMINISTRATOR

CC- DIVISION OF REACTOR LICENSING  
USNRC - BETHESDA, MD

J G LEWIS, PALISADES PLANT

END - WW

NRC BHDA