



Consumers
Power
Company

Palisades Nuclear Plant: Route 2, Box 154, Covert, Michigan 49043

June 17, 1974

Mr. J. Buzy
Operator Licensing Branch
Division of Reactor Licensing
Atomic Energy Commission
Washington, D. C. 20545

Dear Joe:

Enclosed are copies of Palisades Plant Unusual Incident Report 72-86, PRC minutes of 4 December 1972, and a graph compiling chemistry data from the primary coolant system for the period 25 November through 5 December 1972, all of which pertain to the crud release incident to which you referred in your telecon on 8 June. I hope this data will satisfy your needs, but if I can be of further assistance, please call or write.

Sincerely yours,

G. J. Ashworth
Training Coordinator

*Received
80-255*

8306280625 740617
PDR ADOCK 05000255
S PDR

5592

COPY SENT REGION 3

CONSUMERS POWER COMPANY

ABNORMAL OCCURRENCE REPORT

UNUSUAL INCIDENT

NUCLEAR PLANT Palisades

NO. 72-86

SIMILAR TO NO. _____

TITLE PCS Crud Release

DATE 12/1/72

DESCRIPTION (Use attachments as required)

TIME N/A

During the period of 11/29/72 - 12/1/72 it became evident that a sizeable amount of "crud" had been released to PCS water, due to loss of hydrogen and build-up of oxygen.

The effects were seen as follows:

1. PCS crud activity increases.

(over)

AUTHORIZATION FOR IMMEDIATE AND NECESSARY CORRECTIVE ACTION:

SHIFT SUPERVISOR All DUTY & CALL SUPERVISOR JLewis OTHER (Specify) _____

Compi
By J.
Lewis
12/1/72

IMMEDIATE CORRECTIVE ACTION: (Use attached pages as required)

Primary effort was to restore hydrogen cc/kg in the PCS water. A slight power reduction was taken on 12/2 to compensate for the possibility of increased fuel temperatures.

PLANT REVIEW COMMITTEE REQUIRED: YES X NO _____

SAFETY AUDIT REVIEW BOARD: YES _____ NO _____

CAUSE OF ABNORMAL OCCURRENCE:

PERSONNEL X MATERIAL _____ INSTALLATION _____ DESIGN _____

CONCLUSION AND FINAL DISPOSITION (Plant Supt.)

Steps will be taken to improve early detection of chemistry problems in the future. Earlier action could have prevented most of the problem described above.

M. G. Fowler
12/1/72

DESCRIPTION Cont'd

2. A slow decrease in reactivity which was compensated by about 40 ppm dilution.
3. Decrease in letdown regen ht. exchanger efficiency.
4. Radiation & d/p buildup on purif. filters.
5. A 5% temporary increase in primary side SG d/p, per indicated flow readings.

CONSUMERS POWER COMPANY
Palisades Nuclear Plant

Ashworth

PLANT REVIEW COMMITTEE MEETING

Members Present:

December 4, 1972

IMHausler - Chairman
JGLewis
FTPeyton
DWLangschwager
REMcCaleb - Scribe

TWEward
JRSchepers - Construction
JAMeincke
BRChurchill
FEFlynn - C.E.

GJAshworth
GHHein
DRHughes

A. OLD BUSINESS

1. Chlorination of Service Water

The chlorination of the service water system was not completed this past Saturday as calm did not prevail on the lake to allow sample gathering. Per the PRC's approval last week this event will be scheduled for the first Saturday on which the lake is calm.

2. Bellows Clutch Modification for CRDM's

Per the C.E. production model testing programs, three production model bellows were undergoing the 10,000 cycle fatigue testing when one clutch failed to disengage after approximately 7,000 cycles. Subsequent investigation by C.E. has indicated that the cause of failure was excessive wear on the clutch jaws. The testing set-up used by C.E. has a continuously driving motor. This can cause abnormal wear on the teeth of the clutch mating faces when the clutch is energized. It is believed that this abnormal wear on the clutch teeth caused a break down of the protective coating and allowed metal-metal contact between the mating faces. The binding force that resulted from this contact did not allow the clutch to disengage. Further investigation is being conducted by C.E.

3. Facility Changes 137-5&6 (T-99 tie in to T-29 and T 80)

These tie-ins will be delayed until just before the next refueling outage. They will be discussed at that time.

B. NEW BUSINESS

Incident 72-86 PCS Crud Release (see attached Report)

A substantial crud release in the Primary Coolant System during the period of 11/29 through 12/1 necessitated the dilution of the reactor coolant by approximate 40 ppm boron to maintain constant power.

Plant Review Committee Meeting

Subsequent investigation of this incident revealed that the PCS dissolved H_2 had fallen significantly prior to the crud release (See table I.) On 11/29 the Chemistry department notified Operations of the low dissolved H_2 and suggested they investigate. Operations found the bottles on the H_2 manifold to be empty. These were replaced and attempts were made to restore the H_2 blanket on the Volume Control Tank. Later chemistry reports showed the dissolved H_2 to still be very low as late as 12/1. Operations continued to review the problem and on 12/1 closed the second isolation valve for the N_2 purge to the VCT. Subsequent dilutions became less frequent and the chemistry results for the next day (12/2) showed near-normal dissolved H_2 .

The PRC was particularly concerned with the reasons that allowed such a condition to develop and prevented its earlier detection. A local alarm is provided on the hydrogen control system for the generator. This alarm, although not on the line to the VCT, would sense low pressure in H_2 manifold. Operations informed the committee that the set point for this alarm is ~75 psig but because we have been operating at less than full power (60%), the generator is maintained with 45-50 psig H_2 . Therefore the alarm is continuously in and is paid no heed. This situation should be remedied. Earlier detection would have been possible (the attached table shows the sharp drop of dissolved H_2) if it had been more dramatically presented. Currently the chemistry department furnishes operations with a daily sheet of numbers. Potentially serious problems could be more easily detected if these daily sheets were limited to fewer parameters and if these parameters were presented in chart form so that a trend could be readily identified. The present system hinders such early identification.

The committee made recommendations as follows:

1. Engineering should study the hydrogen system and either add an alarm to identify low supply pressure to the VCT or change the existing alarm set point on the generator H_2 system so that low pressure in the H_2 manifold will be recognized.
2. With C.E.'s consultation, the more important chemistry parameters should be identified and only these parameters should be presented on the daily chemistry sheet to Operations. The daily chemistry sheet should be modified to present these parameters in graphic form so trends can be identified.
3. Operations should be alerted that this incident and the resulting net 40 ppm dilution has added approximately $\frac{1}{2}\%$ negative reactivity to the core. This process maybe reversible and borations equalling $\frac{1}{2}\%$ reactivity may be necessary in the future to maintain constant power.

Plant Review Committee Meeting

4. C.E. suggested that the current plan of dropping fourteen control rods once during each two week period be reviewed. The small crud burst associated with each single rod drop may be severely compounded by dropping fourteen rods in a short time period. The one rod a day dropping procedure may reduce the severity of the crud problem.

PCS DISSOLVED GAS TABLE

TABLE 1

All Units in cc/Kg

Date	Total	O ₂	N ₂	H ₂	Actions
11/25	33.89	0	14.54	16.94	
11/27	30.5	0	20.69	4.99	
11/28	31.15	0	27.22	1.82	
11/29	31.02	.25	28.72	0.60	H ₂ bottles found empty and replaced
11/30	32.5	.09	27.93	0.69	
12/1	42.42	.15	37.14	1.05	2nd N ₂ isolation valve closed.
12/2	3.56	---	19.6	13.2	
12/3	41.9	---	12.1	28.8	

C. FACILITY CHANGES

1. F.C.-146 - Governor Valve

NOVEMBER

DECEMBER

→

25

26

27

28

29

30

1st

2

3

4

NOV 25 TO DEC 4 (10 DAYS)

30
20
10

NOV

GROUP 1 (10 DAYS) (10 DAYS)

30
20
10

NOV

BOTANICAL

BOTANICAL

30
20
10

GROSS FLOW (10) (10)

30
20
10

NOV

22.0
22.0
AT
21.75
F
25.5
24.25
13.0

Loop AT

$\Delta T_2 = S-G$ 'B' Loop 2.

$\Delta T = S-G$ 'A' Loop 1

Loop GAS

N₂%

Loop GAS SAMPLE

H₂%

UP TO 1% OXYGEN IN SAMPLE

VCT. 100/10

Loop CROSS CRUD

5.4 psi/cc x 10⁻²

20 5.35 psi

10 5.35 psi

CRUD

F.I.C.
Kardent
72-86

15.25
12.00
9.5

27 NOVEMBER

29 1979

1

2 DECEMBER

4

5