

ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8802230392 DOC.DATE: 88/02/15 NOTARIZED: NO DOCKET #
 FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
 AUTH.NAME AUTHOR AFFILIATION
 DAVISON,W.S. Washington Public Power Supply System
 POWERS,C.M. Washington Public Power Supply System
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-001-00:on 880118,Reactor protective systm automatic
 actuation during plant shutdown due to inadequate procedure.
 W/8 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
PD5 LA	1 1	PD5 PD	1 1
SAMWORTH, R	1 1		
INTERNAL: ACRS MICHELSON	1 1	ACRS MOELLER	2 2
AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
ARM/DCTS/DAB	1 1	DEDRO	1 1
NRR/DEST/ADS	1 0	NRR/DEST/CEB	1 1
NRR/DEST/ELB	1 1	NRR/DEST/ICSB	1 1
NRR/DEST/MEB	1 1	NRR/DEST/MTB	1 1
NRR/DEST/PSB	1 1	NRR/DEST/RSB	1 1
NRR/DEST/SGB	1 1	NRR/DLPQ/HFB	1 1
NRR/DLPQ/QAB	1 1	NRR/DOEA/EAB	1 1
NRR/DREP/RAB	1 1	NRR/DREP/RPB	2 2
NRR/DRIS/SIB	1 1	NRR/PMAS/ILRB	1 1
REG-FILE 02	1 1	RES TELFORD, J	1 1
RES/DE/EIB	1 1	RES/DRPS DIR	1 1
RGN5 FILE 01	1 1		
EXTERNAL: EG&G GROH, M	5 5	FORD BLDG HOY, A	1 1
H ST LOBBY WARD	1 1	LPDR	1 1
NRC PDR	1 1	NSIC HARRIS, J	1 1
NSIC MAYS, G	1 1		

TOTAL NUMBER OF COPIES REQUIRED: LTTR 46 ENCL 45

0723058466

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
Washington Nuclear Plant - Unit 2

DOCKET NUMBER (2)

0 5 0 0 0 3 9 7

PAGE (3)

1 OF 4

TITLE (4)
Reactor Protective System Automatic Actuation During Plant Shutdown
Due to Inadequate Procedure

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	1	8	8	8	8	0	0	2		0 5 0 0 0
0	1	8	8	8	8	0	0	2		0 5 0 0 0

OPERATING MODE (9) 3

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

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.38(c)(1)	50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.38(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME
W.S. Davison, Compliance Engineer

TELEPHONE NUMBER

AREA CODE 5 0 9 3 7 7 - 2 5 0 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13) EXT. 2726

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS
X	S	J	L R	B 0 4 0	NO				

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) ☐ NO ☒

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

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

Abstract

On January 18, 1988, at 1354 hours, following a plant shutdown, an automatic Reactor Protective System (RPS) actuation occurred due to an actual low Reactor Pressure Vessel (RPV) water level condition. While the plant was being maintained in the Hot Shutdown Condition with the Main Steam Isolation Valves closed, a main steam Safety Relief Valve (SRV) was opened to preclude approaching the automatic reactor high pressure RPS actuation setpoint of 1037 psig. While the SRV was open, RPV water level swell effect caused level to increase above the RPV high water level setpoint which resulted in the automatic shutdown of the Reactor Core Isolation Cooling (RCIC) System. This system was being operated to supply water to the RPV and assist in controlling RPV pressure. When the RCIC System shut down, the decision was made to depressurize to 875 psig with an SRV. After reaching the desired pressure, the SRV was closed, causing RPV level to drop from +40 inches to -5 inches. The automatic low RPV level RPS actuation occurred as level decreased through the +13 inch setpoint. During the event, a narrow range RPV level recorder pen stuck at the high end of the scale for approximately one minute. The root cause of the event was procedural inadequacy. Plant procedures did not contain sufficient information to adequately address the degree of difficulty involved in controlling reactor pressure with the plant in Hot Shutdown with the Main Steam Isolation Valves (MSIV) closed. The significant corrective actions include: revision of Plant Procedures to include specific information concerning control of reactor pressure and level in Hot Shutdown with the MSIVs closed, inclusion of this event as a future simulator training scenario, required reading of this LER by licensed operators and completion of an evaluation of the need for a digital RPV level indicator at the reactor control console. This event posed no threat to the safety of Plant personnel or the public.

8802230392 880215

PDR: ADOCK 05000397

IF22

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Washington Nuclear Plant - Unit 2	0 5 0 0 0 3 9 7	8 8	- 0 0 1	- 0 0	0 2	OF	0 4

TEXT (If more space is required, use additional NRC Form 368A's) (17)

Plant Conditions

- a) Power Level - 0%
- b) Plant Mode - 3 (Hot Shutdown)

Event Description

Following a scheduled plant shutdown on January 18, 1988, an automatic Reactor Protective System (RPS) actuation occurred at 1354 hours due to an actual low Reactor Pressure Vessel (RPV) water level condition. At the time of this RPS actuation, the reactor was shut down and the plant was being maintained in a hot condition with the Main Steam Isolation Valves (MSIVs) closed. RPV level and pressure control were being maintained using the Reactor Core Isolation Cooling (RCIC) System and the Reactor Water Cleanup (RWCU) System. Just prior to the event, it was noted by the Control Room Supervisor (CRS) that when RCIC was not injecting into the vessel, reactor pressure was rising at an approximate rate of 3 to 4 psig per minute. When reactor pressure reached 1020 psig, with reactor level at approximately 40 inches, the decision was made to lower reactor pressure to 875 psig using a Main Steam System (MS) Safety Relief Valve (SRV) to discharge to the pressure suppression pool. This decision was based on preventing an automatic reactor high pressure RPS actuation at 1037 psig and to preclude the automatic actuation of SRVs. Under direction of the CRS, in accordance with approved plant procedures, MS-RV-5B was opened and then reclosed. RPV level subsequently swelled, due to core void increase, to greater than +60 inches by narrow range level indication (+50 inches on upset range, no increase on wide range), causing the RCIC turbine steam admission valve (RCIC-V-45) to close at +54.5 inches (RPV Level 8). This resulted in shutdown of RCIC, the system which was supplying water to the reactor vessel. In accordance with approved Abnormal Condition Procedures, approximately ten seconds later, MS-RV-5B was reopened for about two minutes, dropping reactor pressure to 875 psig. The basis for this action was to allow sufficient time for restart of the RCIC turbine in order to minimize SRV lifting prior to restoration of RCIC spray to control pressure. When MS-RV-5B was closed, reactor level dropped from +40 inches to -5 inches. As level decreased through +13 inches, a reactor low level (RPV Level 3) automatic RPS actuation occurred.

Immediate Corrective Action

The plant operators responded in accordance with Plant Procedures by promptly restarting the RCIC System to supply feedwater to the RPV. Reactor level was restored to greater than +13 inches at 1403 hours.

Further Evaluation and Corrective Action

- o This event is being reported as an automatic actuation of an Engineered Safety Feature per the requirements of 10CFR50.73(a)(2)(IV).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

YEAR SEQUENTIAL REVISION

NUMBER NUMBER

Washington Nuclear Plant - Unit 2

0 5 0 0 0 3 1 9 7 8 18 - 0 10 1 - 0 1 0 0 13 OF 0 14

TEXT (If more space is required, use additional NRC Form 368A's) (17)

- o The immediate cause of this event was opening the SRV for a longer continuous period than necessary to control RPV pressure rise, thus allowing water inventory loss sufficient to cause a low RPV level RPS actuation. The licensed senior reactor operator (CRS) did not anticipate the exact response of RPV level as a result of opening an SRV with no feed water being supplied to the RPV.
- o The root cause of this event was determined to be inadequate procedures in that, approved Plant Procedures did not contain sufficient information to adequately address the degree of difficulty involved in controlling reactor pressure and level with the plant in Hot Shutdown with the Main Steam Isolation Valves closed. Control of RPV level while isolated from the condenser with significant decay heat generation and the accompanying level swell-and-shrink transient effects during SRV operation were not addressed in detail by the Plant Procedures.
- o Several contributing factors were identified as having some impact on the response to this event:
 - During the course of the initial RPV water level swell transient, the ink pen for the narrow range reactor level recorder stuck at the high end of the scale. This provided the operators with an erroneous indication of actual RPV level from this recorder. This instrument is one of four narrow range level indicators located on the Reactor Control Console and consequently did not have a major impact on the operational response to this event.
 - Previous to this event, the operator training program covered Hot Shutdown scenarios during simulator training; however, this particular event (i.e., Hot Shutdown with MSIVs closed and no high pressure water source) has not been stressed. Lack of specific training relating to this scenario is considered a contributing factor.
- o All automatic actions which should have been initiated at RPV Level 3 (+13 inches) did occur as designed. The only actual operation of components that occurred were logic relay actuation and repositioning of valves for the reactor scram function of the Control Rod Drive (CRD) System. No control rods were actually repositioned since they had been previously inserted fully into the core. Other automatic functions which occurred are:
 - Reactor Recirculation Pumps received a signal to automatically shift to slow speed (15 hertz) operation. This shift did not occur because both pumps were being operated at 15 hertz at the time of the event.
 - Nuclear Steam Supply Shutoff System (NS4) Groups 5 and 6 received an isolation signal. No valves or components changed status because they were in the isolation position at the time of the event.
 - An Automatic Depressurization System (ADS) Low RPV Level 3 Confirmation Signal was generated. This is one of two control logic RPV level functions required for the ADS initiation of seven Safety Relief Valves.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Washington Nuclear Plant - Unit 2	0 5 0 0 0 3 9 7	8 8	- 0 0 1	- 0 0	0 4	OF	0 4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

- o The narrow range reactor level recorder is a Model No. 732, manufactured by Bailey Instrument Company, GE MPL Number C34-R608. This instrument was inspected, cleaned, calibrated and placed back into service. These instruments are a known high maintenance item. WNP-2 is in the process of evaluating qualified replacements for this type of recorder. No further corrective action is planned.
- o Plant procedures will be revised to include specific information concerning control of reactor pressure and level in Hot Shutdown with the MSIVs closed.
- o A technical evaluation of the need for a digital RPV level indicator at the reactor control console will be performed.
- o This LER will be required reading for all licensed operators at WNP-2 and will be added to the subject matter list for requalification training.
- o This event scenario will be specifically covered as a part of future simulator requalification training.

Safety Significance

The Reactor Protective System functioned correctly to cause an automatic actuation in response to an actual reactor vessel low level (Level 3) condition. The faulty RPV narrow range level recorder reading was compensated for by valid readings on the vertical section of the reactor control console from three reactor narrow range level indicators. With the reactor shut down, the significant safety concern is potential uncovering of the fuel. The top of active fuel is located at -161 inches vessel level. Since the level transient was terminated at -5 inches, more than adequate vessel water inventory remained to assure fuel coverage. This event posed no threat to the safety of Plant personnel or the public.

Similar Events

None.

EIIS InformationText Reference

RPS
RPV
MSIV
RCIC
RWCU
MS-RV-5B
RCIC-V-45
Narrow Range Reactor Level Recorder

EIIS Reference
System Component

JC ----
SB RPV
SB ISV
BN ----
CE ----
SB RV
BN ISV
SJ LR

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352

Docket No. 50-397

February 16, 1988

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

Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 88-001

Dear Sir:

Transmitted herewith is Licensee Event Report No. 88-001 for the WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Very truly yours,

C.M. Powers

C.M. Powers (M/D 927M)
WNP-2 Plant Manager

CMP:sm

Enclosure:
Licensee Event Report No. 88-001

cc: Mr. John B. Martin, NRC - Region V
Mr. C.J. Bosted, NRC Site (M/D 901A)
INPO Records Center - Atlanta, GA
Ms. Dottie Sherman, ANI
Mr. D.L. Williams, BPA (M/D 399)

IE22
11

P 723 058 466