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 FACIL: 50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
 AUTH. NAME AUTHOR AFFILIATION
 ARBUCKLE, J.D. Washington Public Power Supply System
 POWERS, C.M. Washington Public Power Supply System
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-014-00: on 880512, voluntary rept of RWCU sys resin tank spill due to RWCU valves being open. W/8 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 9
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTR 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 7E	1 0	NRR/DEST/CEB 8H	1 1
	NRR/DEST/ESB 8D	1 1	NRR/DEST/ICSB 7	1 1
	NRR/DEST/MEB 9H	1 1	NRR/DEST/MTB 9H	1 1
	NRR/DEST/PSB 8D	1 1	NRR/DEST/RSB 8E	1 1
	NRR/DEST/SGB 8D	1 1	NRR/DLPQ/HFB 10	1 1
	NRR/DLPQ/QAB 10	1 1	NRR/DOEA/EAB 11	1 1
	NRR/DREP/RAB 10	1 1	NRR/DREP/RPB 10	2 2
	NRR/DRIS/SIB 9A	1 1	NUDOCS-ABSTRACT	1 1
	<u>REG FILE</u> 02	1 1	RES TELFORD, J	1 1
	RES/DE/EIB	1 1	RES/DRPS DEPY	1 1
	RGN5 FILE 01	1 1		
EXTERNAL:	EG&G WILLIAMS, S	4 4	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		

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Washington Nuclear Plant - Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 1 9 1 7	PAGE (3) 1 OF 0 8
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TITLE (4) **Voluntary Report of Reactor Water Cleanup (RWCU) System Resin Tank Spill Due To RWCU Valves Being Open - Cause Unknown**

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 5	1 2	8 8	8 8	0 1	4	0 0	0 6	2 8			0 5 0 0 0

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)									
POWER LEVEL (10) 0 1 0 1 0	<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"/> 40.74(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)(viii)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	Voluntary						
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(iii)	<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)(ix)								

LICENSEE CONTACT FOR THIS LER (12)

NAME J. D. Arbuckle, Compliance Engineer	TELEPHONE NUMBER AREA CODE: 5 1 0 1 9 3 1 7 1 7 1 - 1 2 1 1 1 5
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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)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On May 12, 1988 at approximately 1700 hours, a Plant Radwaste Control Room Operator (RWO) discovered that a Reactor Water Cleanup (RWCU) System resin spill had occurred during recirculation of RWCU Phase Separator Tank RWCU-TK-104B. The tank was being recirculated in preparation for transfer of resin to a shipping container. Recirculation of the tank was started at 1445 hours, and tank level reading was noted by the RWO to be 50%. At 1615 hours, while taking log readings, the RWO noted that tank level was 34%. Contrary to procedural requirements, immediate investigation of the level change was not performed because the RWO thought (erroneously) the change was due to a defective level gauge. The RWO rechecked tank level again at 1645 hours and noted it was still decreasing. The RWO then proceeded to the tank location, discovered resin being discharged into Floor Drain FDR-SUMP-W2 and noted that approximately two cubic feet of resin slurry had splashed onto the floor around the drain. At 1715 hours, the RWO secured the recirculation pump (RWCU-P-28) and closed the tank suction and discharge valves. Further investigation revealed that RWCU Sample Line Isolation Valves RWCU-V-442/443 had been open which created a flow path which resulted in the spill. The cause of the valves being open is indeterminate. At 1750 hours the valves were closed by means of the control switches and, at 1800 hours, the RWO confirmed that the drainage had stopped. Upon recommendation of the Plant Manager, the Shift Manager declared an "Unusual Event" at 1903 hours. At 2025 hours, Health Physics had completed clean up of the immediate area and contained the resin in FDR-SUMP-W2. At this time, the Shift Manager terminated the "Unusual Event" classification.

Further corrective actions include 1) tagging shut and de-energizing RWCU-V-442/443, 2) counseling the RWO involved on the importance of monitoring the status of operational tasks, 3) performing a review of other similar (e.g. infrequently used) Radwaste System Valves, and 4) providing additional training on "High" and "High-High" Radiation Areas. This LER is submitted as a voluntary report.

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

Plant Conditions

- a) Power Level - 0%
- b) Plant Mode - 5 (Refueling)

Event Description

On May 12, 1988 at approximately 1700 hours, a Plant Radwaste Control Room Operator (RWO) discovered that a Reactor Water Cleanup (RWCU) System resin spill had occurred during recirculation of RWCU Phase Separator Tank RWCU-TK-104B. The tank was being recirculated in preparation for transfer of resin slurry to a shipping container.

At 1445 hours, the RWO began the recirculation of RWCU-TK-104B in accordance with Plant Procedure (PPM) 2.11.1, "Solid Waste Processing System." Tank level reading was noted by the RWO to be 50%. The RWO then proceeded to perform his normal duties and at 1615 hours, while taking log readings, he noted that the tank level was 34%. Immediate investigation of the level change was not performed because the RWO thought (erroneously) the change was due to a defective level gauge. (The RWO had remembered a recent level gauge problem on an equipment drain tank and thought this situation was similar.) He also did not investigate any further due to the many activities in progress in the Radwaste Control Room at this time. However, not investigating the level change was contrary to a caution statement in PPM 2.11.1 which directs the operator to monitor tank level and, if it drops, isolate the tank immediately because resin sludge is likely leaking out.

At 1645 hours, the RWO checked tank level again and noted it was still decreasing. The RWO then proceeded to the RWCU-TK-104B location (Radwaste Building - Elevation 437') and discovered resin being discharged down a scupper into a Floor Drain (FDR-SUMP-W2). He also noted that approximately two cubic feet of resin slurry had splashed onto the floor around the drain. The RWO immediately left the area, returned to the Radwaste Control Room and, at 1715 hours, secured the recirculation pump (RWCU-P-28) and closed the RWCU-TK-104B suction and discharge valves. He then informed the Shift Support Supervisor (SSS) of the situation, who in turn notified the Shift Manager and Health Physics personnel. At 1725 hours, the SSS, RWO and Health Physics personnel arrived at the area of the spill. Health Physics personnel immediately monitored the area and found that their readings indicated 2-3 R/hr at one inch, with no airborne activity present. The area was posted "NO ENTRY" by Health Physics personnel at 1735 hours.

At this time the Shift Manager, SSS and RWO went to the Radwaste Control Room to review System Flow Diagrams in an attempt to identify the drain path. After reviewing the flow diagrams, they suspected that the drain path was through a sample line on the RWCU-P-28 discharge. Although the flow diagrams showed a shut-off switch for Sample Line Isolation Valve RWCU-V-442, the location of the switch was not identified. (However, the location of valve position indication for Sample Line Isolation Valve RWCU-V-443 was identified in PPM 2.11.1). Unable to locate the switches, the SSS contacted an off-duty SSS who informed him that they were in the "A" Concentrator Room (Radwaste Building - Elevation 467').

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At 1750 hours, the SSS found the control switches for RWCU-V-442/443 and noted they were both in the open position, but the indicating lights were not functional (subsequent investigation revealed that the red [open] lights had been removed and the green [closed] lights were burned out). The SSS then placed the control switches for both valves in the "close" position, and heard the air actuation (both valves are air-operated and are in series).

The SSS dispatched the RWO to the area of the spill and, at 1800 hours, the RWO confirmed that drainage had stopped. It was also noted at that time that RWCU-TK-104B level was 26%.

At 1820 hours, the Shift Manager returned to the Control Room and was informed that an Area Radiation Monitor (ARM-29: Radwaste Building - Elevation 437') had alarmed and was fluctuating between 80 and 100 MR/hr. Being aware of the spill, the Shift Manager contacted Health Physics personnel for information on radiation levels. He was informed that readings at the scene were 2-3 R/hr at 18 inches; however, actual readings logged on the survey map indicated readings of 2-3 R/hr at one inch.

Proceeding with followup management notifications, the Shift Manager contacted the Assistant Operations Manager and the Plant Manager to brief them on the incident. Upon the recommendation of the Plant Manager, an "Unusual Event" was declared at 1903 hours. The Shift Manager, utilizing the CRASH Network, notified the State, County, Department of Energy, and the Supply System Security Communications Center. In addition, PA announcements were made and the NRC was notified by means of the ENS Line.

At 2025 hours, Health Physics personnel had completed clean up of the immediate area and contained the resin in Floor Drain Sump FDR-SUMP-W2. At this time, the Shift Manager terminated the "Unusual Event" classification.

This LER is submitted as a Voluntary Report.

Immediate Corrective Action

Recirculation pump RWCU-P-28 was secured, Sample Line Isolation Valves RWCU-V-442/443 were closed, the area of the spill was cleaned up, the resin was contained in FDR-SUMP-W2, and the "Unusual Event" classification terminated.

Further Evaluation and Corrective Action

A. Further Evaluation

1. The immediate cause of this event was valves RWCU-V-442 and RWCU-V-443 being open. The root cause for the valves being open is indeterminate. As shown in Figure 1, this configuration created the following unknown leakage paths:

- o RWCU-V-442 and RWCU-V-443 Open (Resin Leakage Path)

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With both valves open, and the start of RWCU-P-28, RWCU resin slurry was pumped through the valves to the drain system. As a result of RWCU-TK-104B level changes, it is estimated that 1,000 gallons was inadvertently drained from the tank. This equates to a resin loss of approximately 25-30 cubic feet. The bulk of the resin was contained in the liquid radwaste processing system.

o RWCU-V-442 Open (Condensate Leakage Path)

Condensate water was supplied through COND-V-325, down a 1/2" pipe and through RWCU-V-442 to the drain. It is estimated that the leakage through this flow path was 3.4 gpm.

2. An investigation was performed in an attempt to determine when valves RWCU-V-442 and 443 had been opened. It was discerned that the valves were opened by means of the control switches around 1200 hours on April 28, 1988, because an abrupt increase in FDR-SUMP-W2 run time also occurred at that time. At least two attempts were made to identify the leakage; however, the actual source into the sump (a scupper drain port) was not checked because it was identified as an Equipment Drain (EDR) on Plant drawings instead of an FDR. Upon closing RWCU-V-442 and 443 on May 12, 1988, FDR-SUMP-W2 run time returned to historical values.
3. At the request of the Plant Manager, a Plant Security investigation was conducted to determine the circumstances surrounding the incident. There was no evidence or suspicion to conclude that the opening of RWCU-V-442 and 443 was a deliberate act.
4. A review of PPM 2.11.1, "Solid Waste Processing System," was performed and it was noted that RWCU-V-442 is not listed on the valve checklist, and neither RWCU-V-442 nor 443 are mentioned in Section B, "Reactor Water Cleanup Phase Separators Operation (RWCU-TK-104A/B)."
5. The locations and setpoints of the Area Radiation Monitors (ARMS) in the spill area were reviewed and are as follows:
 - o ARM-28 is located approximately 90 feet from the geometric center of the spill area. The setpoint for this ARM is 50 mR/hr.
 - o ARM-29 is located approximately 18 feet from the geometric center of the spill area. The setpoint for this ARM is 100 mR/hr. The setpoint was changed from 75 mR/hr on February 29, 1988 to reduce the frequency of alarm conditions due to increased background radiation levels (75 mR/hr) associated with the RWCU recirculate and transfer line which is located approximately 12 feet from the detector. The alarm conditions were masking other alarms coming in on Main Control Room annunciators from Radwaste Area Radiation Monitors. There was not a problem by increasing the setpoint because the monitor would continue to alert personnel to changes in area radiation levels.

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

Area Radiation Monitor recorder points in the Main Control Room were reviewed to determine if ARM-28 had also alarmed. The review was unsuccessful because, although the scales are color-coded (Red Scale = ARM-1, 3 and 3A; Green Scale = all others), all recorder pens contained black ink. As a result, it was impossible to differentiate the recordings and verify if ARM-28 alarmed. However, it is unlikely that ARM-28 alarmed during the event due to the distance of the monitor from, and activity levels of, the spill.

6. The area of the spill had been previously identified as a "High-High" Radiation Area by use of a yellow flashing light (identifies exposures in excess of 1R/hr). Prior to entry into this area, Health Physics must be notified and the proper dosimetry obtained. Although the RWO left the area immediately upon discovering the spill, he had entered the area without the required dosimetry, and did not understand the meaning of the yellow flashing light in relation to anticipated exposure levels.
7. A review of PPMS 11.2.7.1, "Area Posting", and 11.2.7.3, "Entry Into and Egress from High Radiation Areas", was performed to determine adequacy with proper posting requirements and consistency with the Plant Technical Specifications. For areas greater than 1,000 mR/hr, where no enclosure exists for the purpose of locking, and where no enclosure can be reasonably constructed around the individual areas, PPM 11.2.7.3 requires that such areas be barricaded, posted and flashing light activated as a warning device. This direction is consistent with the wording in the Technical Specifications.

For areas greater than 1,000 mR/hr, PPM 11.2.7.1 requires that such areas either be locked or, if no enclosure exists for the purpose of locking, the areas shall be barricaded, posted and a flashing light activated as a warning device. Although the wording is not entirely consistent with that of the Technical Specifications, the intent of the procedure is to lock access to such areas where possible.

As a result, either the shield doors at the entrance to the spill area should have been closed and locked, or an enclosure should have been constructed at that location.

B. Further Corrective Action

1. RWCU-V-442 and 443 were tagged shut and de-energized.
2. PPM 2.11.1 was deviated to include RWCU-V-442 on the valve checklist. The required condition for both RWCU-442 and 443 on the valve checklist is "closed."
3. The RWO involved in this event was counseled on the importance of monitoring the status of operational tasks, including procedural compliance and believing Plant instrumentation unless proven otherwise.

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

4. The Shift Support Supervisor's sensitivity was increased to the manpower needs in the Radwaste Control Room during heavy work periods.
5. A review of the Radwaste System will be performed for the purpose of identifying any similar valves (e.g. infrequently used) such as RWCU-V-442 and 443.
6. The Plant drawing (M607, Sheet 3) which incorrectly identified the FDR scupper drain port as an EDR source will be revised.
7. The Area Radiation Monitor recorder pen colors were restored to the correct design configuration (red and green). In addition, an evaluation will be performed to determine if the current design of the recorder can be changed to better differentiate between ARM recordings.
8. The shield doors at the entrance to the spill area were closed and locked.
9. A Plant Quality Assurance survey was conducted to provide an indication of the level of knowledge of Plant personnel regarding radiation barriers. The results of the survey indicated that many of the survey population did not have a clear understanding of "High" Radiation Areas, "High-High" Radiation Areas and ARMS. Accordingly, additional training will be provided to Plant personnel to enhance understanding of "High" and "High-High" Radiation Areas with respect to proper dosimetry and actions required prior to entering such areas during normal and abnormal Plant conditions.
10. Plant procedure 11.2.7.1 is in the process of being revised to make it consistent with the wording in the Plant Technical Specifications and PPM 11.2.7.3.

Similiar Events

None

Safety Significance

There is no safety significance associated with this event in relation to the general public. However, Plant personnel either were, or could have been, impacted as follows:

1. Although the RWO immediately left the spill area upon discovery, it is possible that he could have exceeded the Supply System daily administrative exposure limit (300 mrem) by not recognizing the significance of the yellow flashing light in relation to anticipated exposure levels.
2. The decontamination crew (consisting of three individuals) accumulated a total collective dose equivalent of 0.195 man-rem during recovery operations. The RWO involved received 70 mrem during his shift on the day of the spill.

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The spilled resin slurry was contained in FDR-SUMP-W2. The location of the sump is a low traffic area and is protected by the use of radiological postings. In addition, the shield doors at the entrance to the spill area have since been closed and locked.

It should also be noted that the spill area configuration is such that emptying the entire resin tank could not have resulted in a release of radioactive material.

EIIS Information

Text Reference

EIIS Reference

System Component

Reactor Water Cleanup (RWCU) System
RWCU-TK-104B
FDR-SUMP-W2
RWCU-P-28
RWCU-V-442/443
ARM-28/29
COND-V-325

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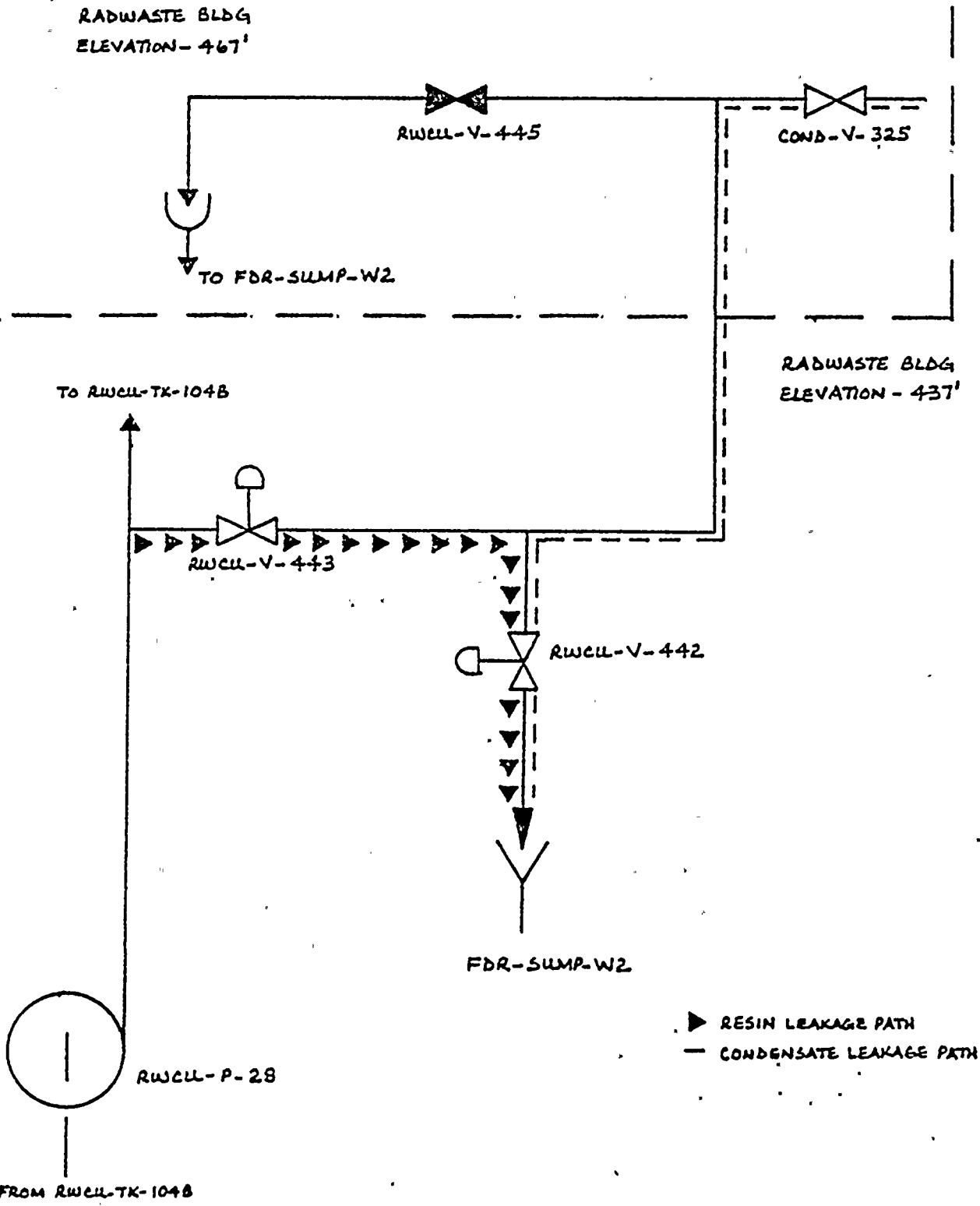


FIGURE 1



WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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

Docket No. 50-397

June 28, 1988

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

Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 88-014

Dear Sir:

Transmitted herewith is Licensee Event Report No. 88-014 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 (M/D 927M)
WNP-2 Plant Manager

CMP:lg

Enclosure:
Licensee Event Report No. 88-014

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)

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