



**Commonwealth Edison**  
 Dresden Nuclear Power Station  
 6500 North Dresden Road  
 Morris, Illinois 60450  
 Telephone 815/942-2920

June 3, 1994

GFSLTR 94-0178

John B. Martin  
 U.S. Nuclear Regulatory Commission  
 Regional Administrator, Region III  
 301 Warrenville Road  
 Lisle, IL 60532-4351

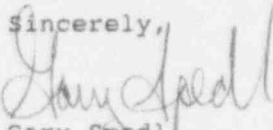
Subject: Dresden Nuclear Power Station Unit 1  
 May 8, 1994 1A Cleanup Storage Tank Event  
 NRC Docket Number 50-010

Reference: (a) May 9, 1994 Teleconference between Commonwealth Edison  
 (CECo) and NRC Region III and NRR Personnel  
 (b) May 11, 1994 letter from Gary Spedl to John B. Martin, Event  
 Description

On May 8, 1994 Commonwealth Edison (CECo) discovered a broken underground contaminated demineralized water line, which released approximately 50,000 gallons of slightly contaminated water. CECo discussed this event with your staff during the Reference (a) teleconference and Reference (b) letter. In the Reference (b) letter, CECo committed to provide the NRC with a copy of the completed root cause investigation. The investigation determined that the release did not occur during the transfer of water, as detailed in the Reference (b) letter, but resulted when the system was tested after the replacement of a valve. The root cause report, which includes the Event and Causal Factor chart, is included as an attachment to this letter.

In addition, attached is Licensee Event Report 50-010/94-001, which is submitted as required by 10 CFR 50.73(a)(1), and NUREG 1022.

If you have any questions, please contact this office.

Sincerely,  
  
 Gary Spedl  
 Station Manager

Attachments: LER 50-010/94-001  
 Root Cause Report

cc: W. Axelson, Director of DRSS - RIII  
 P. Erickson, Project Manager - NRR  
 M. Kunowski - RIII  
 M. Leach, Dresden Senior Resident  
 Illinois Department of Nuclear Safety  
 Document Control Desk  
 File/NRC  
 File/Numerical

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1E22  
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NRC FORM 366 (5-92)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95
<b>LICENSEE EVENT REPORT (LER)</b>		ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

<b>FACILITY NAME (1)</b> Dresden Nuclear Power Station, Unit 1	<b>DOCKET NUMBER (2)</b> 05000010	<b>PAGE (3)</b> 1 OF 4
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**TITLE (4)**  
50,000 Gallons of Unit 1 Contaminated Demineralized Water Released to Ground Water

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 NAME	DOCKET NUMBER
05	07	94	94	-- 001 --	00	06	03	94	None	
									FACILITY NAME	DOCKET NUMBER

<b>OPERATING MODE (9)</b> N	<b>POWER LEVEL (10)</b> 000	<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)</b>			
		<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 73.71(b)
		<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(c)
		<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(v)	<input checked="" type="checkbox"/> OTHER
		<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(vii)	(Specify in Abstract below and in Text, NRC Form 366A)
		<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
		<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
		<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(x)	

**LICENSEE CONTACT FOR THIS LER (12)**

<b>NAME</b> Brian Viehl, Operations Supervisor	<b>TELEPHONE NUMBER (Include Area Code)</b> Ext.2870 (815) 942-2920
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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
B	KC	PSP		N					

<b>SUPPLEMENTAL REPORT EXPECTED (14)</b>				<b>EXPECTED SUBMISSION DATE (15)</b>		
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO		MONTH	DAY	YEAR

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)**

This report is voluntarily submitted in accordance with 10CFR50.73(a)(1). On Sunday, May 8th, 1994 at approximately 0830, Operations personnel observed an excessive amount of water flowing from one of the storm sewer drains into the Unit 1 intake canal. The source of the water was traced back to the ground near the Unit 1 Radwaste Decant Building. The water was determined to be from the 1A Contaminated Condensate Storage Tank (CST), which was being pumped by the Contaminated Demin Jockey Pump into the Unit 1 Contaminated Demin header (buried schedule 80 carbon steel pipe) and out of a hole into the ground. The jockey pump was running to perform an in service leak test to a repaired valve located in the decant building. The jockey pump was secured and isolated, stopping the spill. The change in level during the test indicated that approximately 50,000 gallons was pumped into the ground. The water was sampled and found to be only slightly contaminated; the activity was not detectable using local survey instruments, and laboratory analysis verified that the activity to be well below 10CFR20 Appendix B limits and ODCM calculation. The highest activity concentration measured was 8.87 E-7 mc/mL of Cs-137 and 2.08 E-7 mc/mL of Co-60. Radiation Protection Personnel took control of the spill. The area surrounding the spill was roped off and the standing water was pumped into the Unit 1 Radwaste System. All areas were surveyed and ropes removed by Tuesday, May 10.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Dresden Nuclear Power Station	05000010	94	-- 001 --	00	3 OF 4

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

sampling. At 0900 Rad Protection was notified to control the area. Chemistry was sampling various points of ground water, U1 intake Canal and storm sewer discharge lines. At 0930 the Unit 1 Operating Engineer, Health Physics Supervisor, Lead Rad Protection Supervisor, the Station Duty Officer and the resident inspector were all notified. At 1000 Rad Protection reported that the activity of the water was not detectable via local survey instrumentation and wet smears and the 1A CST was sampled. At 1100 HP verified the activity released was below the 10CFR20 App B limits and ODCM calculations. At 1202 on May 8, the 1A C level was recorded to be 50%.

At 1223 the handwritten OOS 1-3001 was hung on the U1 Contaminated Demin Pump discharge valves. and pumped to the Unit 1 radwaste system At 1330 RP survey of area found no contamination on ground.

At 1150 on May 9, the computer version of OOS 1-3001 was hung. Following the decision to make a Press Release, at 1548 a 4 hour ENS notification was made in accordance with 10CFR50.72(b)(2)(vi), Inadvertent release of radioactive contaminated materials (SE log).

May 10th-12, digging activities exposed the line to determine the failure mechanism. On May 12, the location of the underground pipe break was exposed.

Review of maintenance history identified that this type of underground pipe failure has occurred before.

C. CAUSE OF EVENT:

This report is submitted voluntarily in accordance with 10CFR50.73(a)(1). The root cause of this failure is that the pipe coating failed and exposed the 2 inch schedule 80 carbon steel pipe to ground water and impurities, which lead to localized outside diameter initiated corrosion. Based on the material removed from the soil while digging it is believed that a rock came in contact with the pipe coating and caused this failure.

A root cause of the event was a management deficiency, in that multiple operating crews observed the decrease in CST level without recognizing its significance or taking action.

A contributing factor in this event is that the level of knowledge of the Unit 1 Equipment Status by the Operating Engineer and the Operating Shift was less than adequate. The training, maintenance, housekeeping and operations on Unit 1 have not been held to the same standards as the operating units. This resulted in inadequate control and awareness of the in service leak test.

Another contributing factor identified is the improper weatherization practices which are followed on Unit 1. It is common for valves in the outlying buildings to freeze and rupture.

D. SAFETY ANALYSIS:

The radiological impact of this event was very small. The source of water, the 1A CST, is only slightly contaminated. The activity concentration is less than the required lower level of detection for liquid effluents. If all 50,000

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Dresden Nuclear Power Station		05000010		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
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gallons of contaminated demineralized water lost from the tank were released to the river, the maximum dose to an individual downstream would be less than .0001 millirem.

Additionally the safety significance of this event is minimal since sufficient makeup water is available to the Unit 1 Fuel Pool from the Clean Demin and Fire water systems. No other systems, structures or components were affected.

**E. CORRECTIVE ACTIONS:**

The Site Engineering and Construction (SEC) Manager will develop a lessons learned topic to highlight the proper Backfilling requirements which are described in specification K-4080. The Maintenance Superintendent and SEC Manager will tailgate this information to station maintenance personnel and craft personnel.

The cathodic protection system is being upgraded by installing additional deep well anodes D24483. This activity is in progress and it is viewed by the station as one of the top 25 technical issues.

The Senior Operating Engineer will reenforce the expectation that adverse trends are to be reported and elevated by operating personnel. This event will be used as a Lessons Learned for shift personnel.

The Unit 1 decommissioning team will develop a plan to train appropriate station personnel on future configuration plans.

The Unit 1 Operating Engineer will determine which operator aids are required to maintain equipment status, consideration should be given to drawings, procedures, and/or status boards.

**F. PREVIOUS OCCURRENCES:**

None

**G. COMPONENT FAILURE DATA:**

Not Applicable



### EVENT SUMMARY AND CAUSE CODES

LER NUMBER

12-1-94-001

<input type="checkbox"/>	Lost generation
<input type="checkbox"/>	Cost > \$25,000
<input checked="" type="checkbox"/>	Hazard or Spill
<input type="checkbox"/>	Personnel injury

<input type="checkbox"/>	Reactor trip
<input type="checkbox"/>	ESF actuation
<input type="checkbox"/>	NRC reportable
<input type="checkbox"/>	LER
<input type="checkbox"/>	PSE

<input type="checkbox"/>	NRC violation, level	_____
<input type="checkbox"/>	GSEP event, class	_____
<input type="checkbox"/>	Tech Spec LCO	_____
<input type="checkbox"/>	Potential or future loss	_____
<input type="checkbox"/>	SALP functional area	OP _____

Component Type				Failure mode								
X	P	R	M		1							Pipe Leak
X												
X												

Licensed? L or blank				Type				Detail Code				
Level												
Department												
A		S	O					I	4			Inattention
A		S	O					M	3			Equipment Status not conveyed
A												

Type				Detail Code				Department				
B	I							N	S			Component not installed to specification.
B												
B												

Type	Detail Code													
C														

Type of Deficiency				Detail Code				Procedure Type						
D														
D														
D														

Type				Detail Code				Department						
E														
E														
E														

June 2, 1994

To: Gary Spedl

Subject: Recommendations from the Contaminated Demineralized  
Water Line Leak in the Unit 1 Radwaste Area

The following provides a summary of the Investigation Team's recommendations from the May 8, 1994 discovery of excessive ground water in the Unit 1 Radwaste area caused by leakage of approximately 50,000 gallons from an underground section of the Unit 1 Contaminated Demineralized Water Line. The Investigation Team was comprised of Ken Housh(System Engineering), Rick Raguse(Rad Protection), Greg Riebe(Maintenance), Pete Holland(Corporate-Human Performance), John Hines and Brian Viehl (Operations). Attachment A contains the Event Causal Chart which explains the sequence and root cause of the events.

1.a. Establish that the same standards, practices, operations, etc., apply to all three units rather than making a distinction between Unit 1 and Units 2/3(Korchynsky). b. Formal communication channels should be used for transmitting critical information. This event should be used as a Lessons Learned to reinforce the expectation that adverse trends (i.e. tank level decrease) need to be promptly questioned, reported and evaluated by the Operating personnel(Korchynsky). This should be clearly understood by all Operations personnel from the Shift Engineer to the Equipment Attendant. Coordination and awareness of the tank level readings and communications between shift personnel were clearly lacking relative to the decrease in the 'A Condensate Demineralized tank level. Opportunities existed to minimize the volume of contaminated water that was released to the environment.

2. a. Plant/System status for any activity should be fully known so that appropriate planning can be performed to ensure proper execution. b. Continue with current efforts to get personnel training completed so that this barrier can be effective. Personnel simply did not know when we last operated the system, the configuration of the line or where the line ran. Develop a tool which can be used by the Operating shift to track Unit 1 equipment status(Strobel). Essential Unit 1 drawings should be provided for the shift operating personnel(Palagi-Muth). Continue with current efforts to train personnel on Unit 1 operation, including future configuration plans (see current NTS item# 0102009400104).

3. Continue with Unit 1 decommissioning efforts to eliminate all non-essential systems/components. We have to get tough with this review. The contaminated demineralized water system contains over 800 ft of piping. The main purpose of this system is to provide a secondary makeup for water addition to the Unit 1 fuel pool(primary makeup is a 3/4" clean demineralized line). Over two-thirds of this system including all of the underground section could be eliminated with a cut and cap. Additionally, this system was being placed in service in addition to the existing fire hose(service water) as the secondary makeup for the fuel pool. The Investigation Team recommends that we review the cost benefit of operating the Unit 1 Contaminated Demineralized Water System(Palagi).

The options which exist are a. Cutting and capping just the unused portion of the system, b. Permanently taking the entire system out of service or c. Running the system as originally intended.

4. Reassess the implementation requirements for the weatherization policy and practices to ensure this failure mechanism (line/valve freezing due to inadequate or lack of heat) is minimized. This is currently an open item from the Sphere Event and is being tracked through NTS Item # 01012194001A1. The -008 valve which was being in service tested during the running of this system has previously broken due to freezing conditions and has been replaced twice (undocumented) in the last 3 years. No present plans exist to provide heat for this valve. We need to determine whether the Unit 1 Decant Building needs to be heated and specifically how to provide heat to the 7199-008 valve. This should be included under the above NTS item.

5. Institutionalize proper backfill requirements and practices. The pipe failure was due to localized corrosion at the two o'clock position on the pipe. It is strongly suspected that this is the result of a localized pipe coating failure as a result of rock/stone in the backfill in contact with the pipe surface. The failure of the coating was the defect which "opened the door" to allow corrosion of the line. It is understood that General Work Specification, K-4080, discusses the requirements for backfilling of underground facilities (section 0223). This event should be used as a lessons learned for construction and maintenance personnel who perform backfill activities (Wheeler/Pape).

6. Applicability to other systems. It is recognized that a Cathodic Protection System is being installed under NWR 24483. This system is needed and could have helped to prevent this failure. The Team recommends cathodic protection be expeditiously installed consistent with Station Priorities (Pape). It is recognized that the Unit 1 Project Team is proceeding with the "Monitoring Program for the Integrity of Structures, Systems and Components for Dresden Unit 1". The program identifies the lay up procedure for unused systems and explains that systems in operation "are not part of this program and are covered by normal station practices." We believe this program to be inadequate for operating systems. To preclude an event such as this leak from reoccurring, the Investigation Team strongly recommends that for Unit 1 systems in service, we evaluate the cutting and capping of the unused portions of these systems (Palagi). Results of the Unit 1 review will be supplied to Engineering to determine applicability for Units 2 and 3 (Palagi). Specifically, the in service systems and portions thereof need to be reviewed with respect to the following items:

- underground or above ground
- cost benefit of operating the systems
- alternatives to operating the system
- applicability of other lines to this event (2" carbon steel line, schedule 80 pipe)
- contaminated or clean process flow
- potential HAZMAT issues

The goal of this review is to minimize the possibility of a spill event. This review would determine what systems or portions of systems could be placed in lay-up and whether we should replace or develop a test program to ensure the integrity of systems.



Items to be reviewed for possible changes:

1. Put date and time on the temporary lift sheet out of service order(Viehl). This item simply allows better documentation of the activities.

2. Computer alarm or change setpoints for static tanks to flag changes from static values(Korchynsky). The Unit 1 contaminated demineralized water tank had been, prior to this event, at the 75% water level for an extended period of time. The decrease in water level to the 50% level was never flagged as a problem.

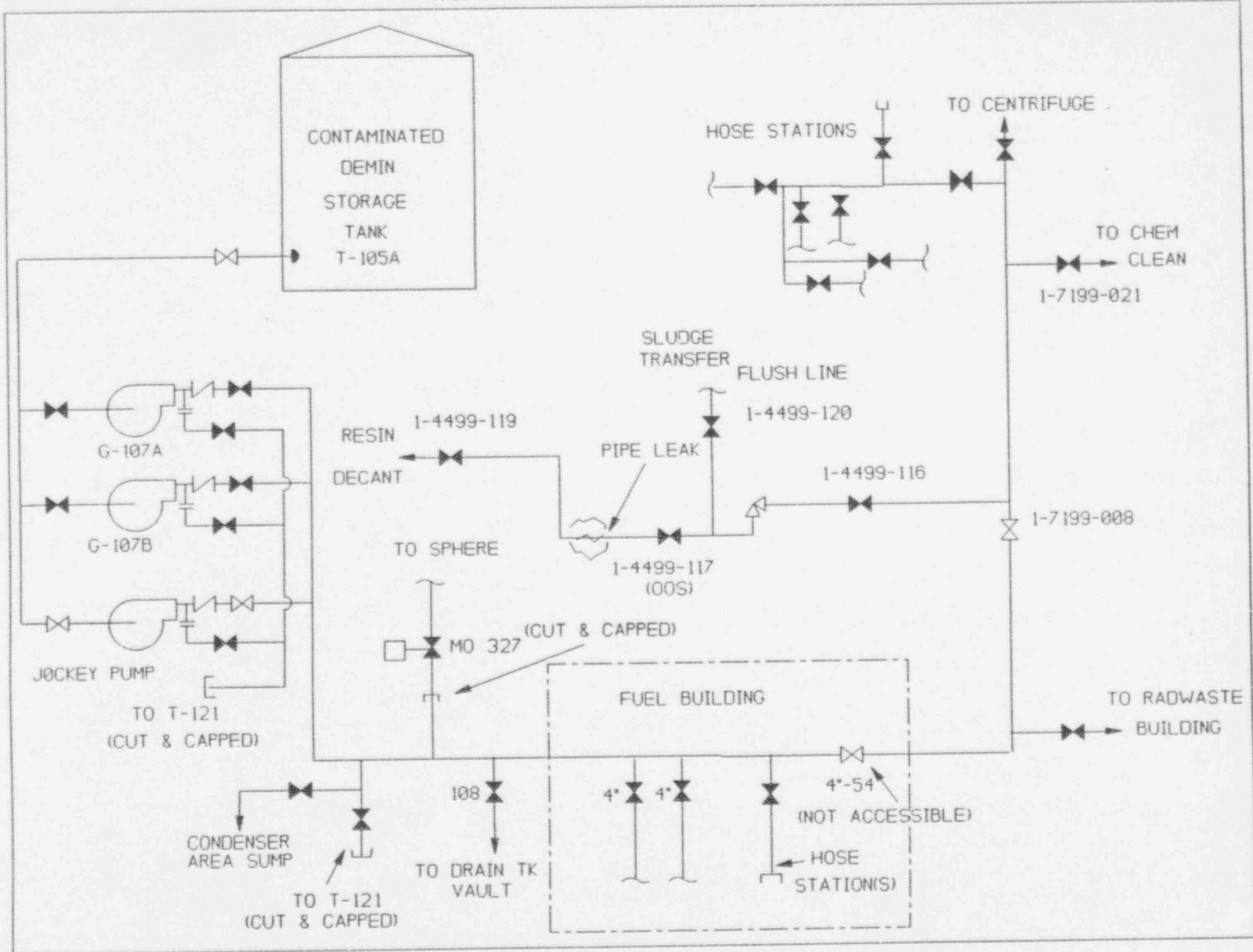
3. The method of presentation for trending of the tank water levels on the Yokogawa recorders is felt to be less than adequate and should be assessed(Coonan). The recorders simply do not provide enough historical information to the operator to assess whether a problem may exist.

Brian Viehl 6/2/94

Brian Viehl  
Investigation Team Leader

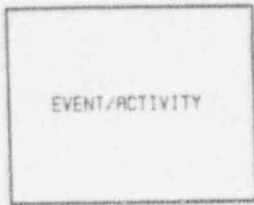
cc: B. Palagi  
E. Armstrong  
D. Strobel  
M. Korchynsky  
J. Kotowski  
R. Aker  
D. Wheeler  
T. O' Connor  
M. Pape  
J. Coonan  
M. Strait  
Investigation Team

UNIT 1 CONTAMINATED DEMIN WATER SYSTEM



ATTACHMENT A  
EVENT CAUSAL CHART  
ROOT CAUSE ANALYSIS

Legend



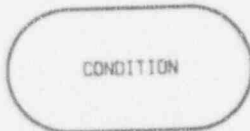
An action or happening that occurred



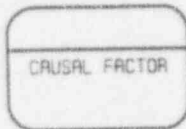
An obstruction, boundary or limitation



An endorsement of a decision or course of action



Circumstances pertinent to the situation that may have influenced the course of events



A factor that shaped the outcome of the situation



The end point of the evaluation