

Commonwealth Edison Company  
Dresden Generating Station  
6500 North Dresden Road  
Morris, IL 60450  
Tel 815-942-2920

10CFR50.73



April 14, 2000

PSLTR: #00-0064

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

Dresden Nuclear Power Station, Unit 2  
Facility Operating License No. DPR-19  
NRC Docket No. 50-237

Subject: Licensee Event Report 1999-005-01, "Inadvertent Reactor Vessel Drain Down Through an Electromatic Relief Valve Caused by Procedure Non-Adherence Due to Inadequate Supervision and Ownership of Work"

The enclosed Licensee Event Report, which is a final report, describes the Inadvertent Reactor Vessel Drain Down Through an Electromatic Relief Valve Caused by Procedure Non-Adherence Due to Inadequate Supervision and Ownership of Work. This condition is being reported pursuant to 10CFR50.73(a)(2)(iv), which requires the reporting of "any event or condition that resulted in a manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS)."

The following immediate actions were taken:

The "E" ERV pilot assembly was replaced. The station has quarantined the removed component for performance of a component failure analysis.

This correspondence contains the following commitments:

A permanent full-time supervisor (e.g., a project manager) will be assigned cognizance over the work performed on SRVs and ERVs to ensure proper oversight, consistency, continuity, knowledge base and completeness of the work. This will ensure that the gag removal and closure of the work has been performed.

Valve Maintenance Supervisor shall develop an oversight plan for valve maintenance work to include a formal written turnover process to be used for package turnovers between responsible supervisors, the pre-identification of owners to receive work prior to turnover, and in-field monitoring of work in progress.

DFOT  
IE22

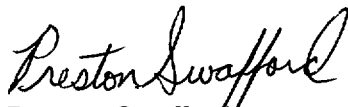
April 14, 2000  
U.S. Nuclear Regulatory Commission  
Page 2

Valve Maintenance Supervisor along with Operations will evaluate the Out-of-Service Program for potential process failures. This review will further evaluate the OOS practice that allowed the clearing of the OOS with the work package not being complete.

Procedural compliance improvements will be achieved by combining procedures to combine Electromatic Relief Valve Replacement with Electromatic Relief Valve Actuator Preventive Maintenance to improve coordination between work groups.

Should you have any questions, please contact D. F. Ambler, Dresden Regulatory Assurance Manager at (815) 942-2920 extension, 3800.

Respectfully,

A handwritten signature in black ink, appearing to read "Preston Swafford". The signature is fluid and cursive, with the first name "Preston" and last name "Swafford" clearly distinguishable.

Preston Swafford  
Site Vice President  
Dresden Nuclear Power Station

Enclosure

cc: Regional Administrator – NRC Region III  
NRC Senior Resident Inspector – Dresden Nuclear Power Station

## LICENSEE EVENT REPORT (LER)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the information and Records Management Branch (1-6 f33), 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. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)

Dresden Nuclear Power Station, Unit 2

DOCKET NUMBER (2)

05000237

PAGE (3)

1 of 6

TITLE (4)

Inadvertent Reactor Vessel Drain Down Through an Electromatic Relief Valve Caused by Procedure Non-Adherence Due to Inadequate Supervision and Ownership of Work

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MON	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	19	1999	1999	005	01	04	14	2000	N/A	N/A
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more) (11)							
5			20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)	
POWER LEVEL (10)			20.2203(a)(i)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)	
00			20.2203(a)(2)(i))		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71	
			20.2203(a)(2)(ii)		20.2203(a)(4)		X 50.73(a)(2)(iv)		OTHER	
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)			

## LICENSEE CONTACT FOR THIS LER (12)

NAME

Michael Andjelic, Maintenance Programs

TELEPHONE NUMBER (Include Area Code)

(815) 942-2920 ext 3627

## COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

## SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On October 19, 1999, at approximately 1715 hours, following removal of the Main Steam Line (MSL) "B" plug by station personnel, an inadvertent draindown of the Unit 2 Reactor Cavity commenced. Operations personnel immediately recognized the event in progress, and took appropriate actions to terminate the event. Control Room personnel manually started the 2B Core Spray Pump to restore and control cavity water level. The Outage Control Center (OCC) was notified of the event and station personnel were directed to reinstall the MSL plugs that had been removed. At approximately 1750 hours, management personnel entered the Unit 2 Drywell and identified that water was flowing through the "E" Electromatic Relief Valve (ERV). The "E" ERV closed following mechanical agitation of its associated pilot valve assembly, terminating the event.

This LER is being submitted pursuant to 10 CFR 50.73 (a)(2)(iv), which states the licensee shall report any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF). Based upon physical inspection of the ERV pilot valve, review of the maintenance work packages and interviews with maintenance personnel, the investigation concluded that the cause for the event was failure to follow and complete procedures as written due to inadequate supervision and ownership of the work. An Evaluation of the event concluded that fuel integrity was never challenged and core submergence maintained. As a result, the Nuclear Safety Significance of the event was minimal. A review of Station events since 1995 did not identify any similar events.

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Dresden Nuclear Power Station, Unit 2	05000237	1999	005	01	2 OF 6

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

**PLANT AND SYSTEM IDENTIFICATION:**

General Electric - Boiling Water Reactor - 2527 MWt rated core thermal power

Energy Industry Identification System (EIS) Codes are identified in the text as [XX] and are obtained from IEEE Standard 805-1984, IEEE Recommended Practice for System Identification in Nuclear Power Plants and Related Facilities.

**EVENT IDENTIFICATION:**

Inadvertent Reactor Vessel Drain Down Through an Electromatic Relief Valve Caused by Procedure Non-Adherence Due to Inadequate Supervision and Ownership of Work.

**A. PLANT CONDITIONS PRIOR TO EVENT:**

Unit: 2	Event Date: 10-19-99	Event Time: 1715
Reactor Mode: 5	Mode Name: Refuel	Power Level: 00
Reactor Coolant System Pressure: 0 psig		

Unit 2 was in Operational Mode 5, day 18 of Refueling Outage D2R16. Main Steam Line plugs were being removed to support upcoming reactor vessel cavity draindown activities. The Fuel Pool Gates were removed.

**B. DESCRIPTION OF EVENT:**

This LER is being submitted pursuant to 10 CFR 50.73 (a)(2)(iv), which states the licensee shall report any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF).

On October 8, 1999, Operations personnel placed equipment Out-of-Service (OOS) for Maintenance Department personnel to work on four Main Steam [SB] Electromatic Relief Valves (ERVs). The scope of the work for the 2-0203-3E ERV included replacement of the ERV, its associated pilot valve, and performance of surveillance testing of the pilot valve's solenoid actuator in accordance with Station procedures.

During the period from October 12th through October 13th, mechanics removed the ERV and replaced it with a rebuilt valve which had a gag as required by Station procedure (the purpose for the gag is to prevent inadvertent operation of the ERV pilot valve). Work package steps for removal and installation of the valve were completed up to and including final torquing of the mounting bolts.

On October 13, mechanics obtained preliminary measurements of the pilot valve stem stroke by performing steps of the approved station procedure. In order to obtain these measurements, the previously installed gag must be removed or repositioned. The removal of the gag per the required procedure was not completed nor identified by ComEd Supervision (Inappropriate Action). That same day, the contract Supervisor who was overseeing the job was informed that he should turn over his work to a ComEd Maintenance Department Supervisor due to a decrease in contract personnel assignments required at the station.

On October 15, the contract Supervisor provided a written turnover indicating that a mechanic and electrician needed to be at the valve when it was cycled.

On October 16, Operations personnel electrically cycled the 2-0203-3E ERV for electricians to perform alarm and limit switch checks per station procedure. Operations was aware that the work package was incomplete but was unaware the gag was still installed. Neither the mechanics nor the electricians were present at the valve when the valve was cycled since procedurally there are no requirements for personnel to be at the valve when it is stroked

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Dresden Nuclear Power Station, Unit 2	05000237	1999	005	01	3 OF 6

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

from the control room.

On October 19, the first two Post Maintenance Tests (PMT's), which included ERV pressure switch calibration without functional testing and ERV pressure switch calibration with functional testing were successfully completed. (Note: this testing demonstrates that the solenoid indicating lights were operational – not necessarily that the pilot valve functioned properly.)

With the Fuel Pool Gates out as planned, "C" and "D" Main Steam Line (MSL) plugs were removed to support reactor cavity vessel drain down. At about 1715, just after personnel pulled the plug from the "B" MSL, Operators identified dropping Reactor Vessel Cavity and Fuel Pool level. Control Room personnel manually started the 2B Core Spray Pump to restore and control cavity water level. The OCC was notified of the event and station personnel were directed to reinstall the MSL plugs that had been removed. At 1750, Management personnel entered the Unit 2 Drywell and identified that water was flowing through the 2-0203-3E ERV. Personnel who responded to the event mechanically agitated the ERV pilot valve until the pitch of the flow through the 2-0203-3E ERV was heard to go up and then flow through the ERV ceased. The Control Room was notified and subsequent monitoring determined that no additional water was draining from the reactor vessel cavity. While at the valve, the personnel noted that the actuator gagging device was still on the ERV pilot valve, though mis-positioned.

On October 23, the 2-0203-3E ERV pilot valve was replaced per Station procedure due to suspected intrusion of debris. Manual operation of the removed pilot valve was performed and no pilot valve problems were observed. Inspections for the presence of foreign material was performed and no material was found. The removed pilot valve assembly was quarantined. The new pilot assembly was installed on the ERV and verified to operate as designed.

On October 26, the 2-0203-3E ERV operated successfully at pressure when tested per Station procedures.

On November 1, a team composed of Maintenance and Engineering personnel performed a detailed inspection and analysis of the quarantined pilot valve. The findings are summarized as follows:

- Each stroke of the valve was smooth and no binding of the pilot valve during operation was observed.
- A general inspection of the pilot valve assembly found that no foreign material was present and the general appearance of the valve was clean. The seating surfaces were in good condition and showed no indication of foreign material induced damage.
- The pilot valve stem had slight galling marks on an otherwise smooth surface.
- The pilot valve seat bushing's outer surface revealed an indication of where a compressed spring had been pressed against the side of the bushing.

**C. CAUSE OF EVENT:**

Based upon physical inspection of the ERV pilot valve, review of the maintenance work packages and interviews with maintenance personnel, the investigation concluded that the cause for the event was failure to follow and complete procedures as written due to inadequate supervision and ownership of the work (NRC Cause Code E). Evidence supporting this is as follows:

- Physical inspection of the ERV pilot valve stem and bushing revealed that the ERV pilot valve spring cap was skewed believed to be due to inappropriate maintenance. Potential causes include contact with the ERV gag, mechanics wrench, or mechanics hands during ERV gag repositioning. The most likely cause is contact with the ERV gag. The ERV gag should have been removed and was not. This was due to failure to follow station procedure as written. The procedure was not followed as written due to inadequate supervision and ownership of the work.

Maintenance supervision failed to:

- review the work package for completeness,

# LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Dresden Nuclear Power Station, Unit 2	05000237	1999	005	01	4 OF 6

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

- ensure correct sequence of steps were signed off in the work package,
- establish proper oversight of ERV work
- establish proper expectations and overview for contract supervision

Inadequate ownership of the overall work on the ERVs due to:

- Lack of formal turnover from the contract VM Supervisor to the MMD Supervisor
- No single owner for the ERV work.

The following items were found to be contributing causes to the event:

- Maintenance signed-off the OOS with the package not at a complete status. This was inappropriate for the following reasons:
  1. The MMD Supervisor did not verify that the equipment was in a condition that was safe to operate.
  2. Work package steps were not completed.
- Procedures used were inadequate to control the work for the following reasons:
  1. There was no formal requirement to ensure the gag was removed in the electrical work package.
  2. The split between the mechanical and electrical packages contributed to the inadequate coordination of the work. Also, the work was performed using two separate procedures.
  3. The electrical procedure allowed remote cycling of the ERV without electricians stationed locally at the valve.
  4. There was no Operations involvement in control of the gags (i.e., no Caution Cards on ERV control switches.)

## D. SAFETY ANALYSIS

Assuming no operator intervention, the flowpath established during the event sequence would have resulted in self-termination once cavity level reached the Main Steam Lines, with core submergence maintained. Additionally, with the fuel pool gates removed, the pool level decrease also self-terminates upon reaching the bottom of the transfer canal, assuring spent fuel submergence. As demonstrated during this event, adequate ECCS systems remained available during refueling activities to assure long-term core submergence through their ability to provide makeup into the reactor vessel.

Operations response to this event was prompt and limited the level decrease to approximately 5 inches. Task monitoring during MSL plug removal clearly demonstrated methodical implementation, clear communications and parameter monitoring (locally and in the Control Room) to high standards, resulting in prompt identification and correction. At all times, a minimum water level of twenty-three feet was maintained above the fuel in the spent fuel pool and fifty feet of water was maintained above the reactor core. Evaluations of the event concluded that fuel integrity was never challenged and core submergence maintained. As a result, the Nuclear Safety Significance of the event was minimal.

## E. CORRECTIVE ACTIONS:

1. A permanent full-time supervisor (e.g., a project manager) will be assigned cognizance over the work performed on SRVs and ERVs to ensure proper oversight, consistency, continuity, knowledge base and completeness of the work. This will ensure that the gag removal and closure of the work has been performed. (ATI 18034-28)
2. Valve Maintenance Supervisor shall develop an oversight plan for valve maintenance work to include a formal written turnover process to be used for package turnovers between responsible supervisors, the pre-identification of owners to receive work prior to turnover, and in-field monitoring of work in progress. (ATI 18034-29)

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Dresden Nuclear Power Station, Unit 2	05000237	1999	005	01	5 OF 6

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

3. Valve Maintenance Supervisor along with Operations will evaluate the Out-of-Service Program for potential process failures. This review will further evaluate the OOS practice that allowed the clearing of the OOS with the work package not being complete. (ATI 18034 -30)
4. Procedural compliance improvements will be achieved by combining procedures to combine Electromatic Relief Valve Replacement with Electromatic Relief Valve Actuator Preventive Maintenance to improve coordination between work groups. (ATI 18034-27)
5. The "E" ERV pilot assembly was replaced. The station has quarantined the removed component for performance of a component failure analysis. (Complete)

**F. PREVIOUS OCCURRENCES:**

A review of Station events for the previous two (2) years did not identify any similar events.

**G. COMPONENT FAILURE DATA:**

Not applicable.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Dresden Nuclear Power Station, Unit 2	05000237	1999	005	01	6 OF 6

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

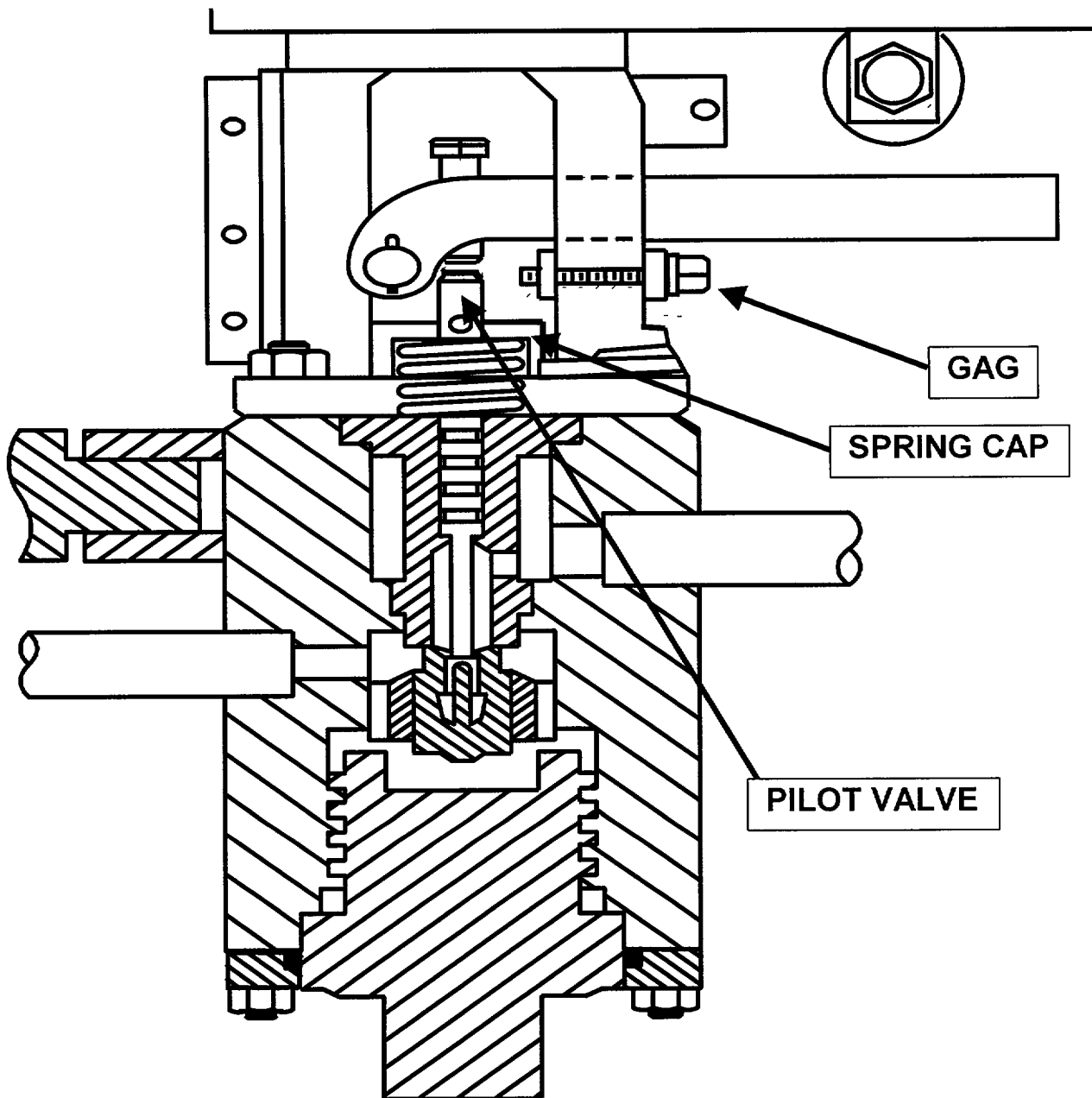


Figure 1  
ERV Pilot Valve Diagram