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ACCESSION NBR: 8904270343 DOC. DATE: 89/04/21 NOTARIZED: NO DOCKET #
 FACIL: 50-412 Beaver Valley Power Station, Unit 2, Duquesne Light C 05000412
 AUTH. NAME AUTHOR AFFILIATION
 NOONAN, T.P. Duquesne Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-005-00: on 890322, inadvertent safety injection. W/8 ltr.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: LPDR 2cys Transcripts. LPDR 2cys PDR Documents. 05000412 S
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LICENSEE EVENT REPORT (LER)

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TITLE (4)
Inadvertent Safety Injection

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	3	2	8	9	0	0	4	2	N/A		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 0 0	20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	50.73(e)(2)(iv)	73.71(b)					
	20.405(a)(1)(i)	50.36(c)(1)	<input type="checkbox"/>	50.73(e)(2)(v)	73.71(c)					
	20.405(a)(1)(ii)	50.36(c)(2)	<input type="checkbox"/>	50.73(e)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)					
	20.405(a)(1)(iii)	50.73(e)(2)(i)	<input type="checkbox"/>	50.73(e)(2)(viii)(A)						
	20.405(a)(1)(iv)	50.73(e)(2)(ii)	<input type="checkbox"/>	50.73(e)(2)(viii)(B)						
	20.405(a)(1)(v)	50.73(e)(2)(iii)	<input type="checkbox"/>	50.73(e)(2)(ix)						

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME Mr. Thomas P. Noonan, General Manager	AREA CODE 4 1 2	NUMBER 6 4 3 - 1 2 5 8	

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS
D	X X	X X X X	X X X X	N					

SUPPLEMENTAL REPORT EXPECTED (14)	EXPECTED SUBMISSION DATE (15)	MONTH DAY YEAR
<input type="checkbox"/> YES (If yes complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	

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

At 0530 on 3/22/89, a Safety Injection (SI) occurred due to Low Pressurizer Pressure. The plant was preparing to enter its first Refueling Outage and was in Mode 5 at the time of this event. The High Head and Low Head Safety Injection systems had been removed from service due to the plant shutdown, as per procedure, and thus did not inject. The Train A Diesel Generator started, as designed. The "B" Safety Injection Accumulator Isolation valve was energized due to surveillance testing and opened due to the SI. Approximately 2400 gallons of water were transferred from the accumulator to the Reactor Coolant System (RCS). The SI occurred due to having two Pressurizer Pressure channels in test simultaneously, which completed the 2/3 Safety Injection initiation logic. This event was caused by inadequate procedural guidance, combined with human error. The Pressurizer Pressure calibration procedure, the Station Shutdown procedures and the Accumulator Isolation valve surveillance test are being revised to prevent similar events. There were no safety implications due to this event. The "B" Safety Injection Accumulator had been depressurized to less than 60 psig prior to this event, so there was no potential for overpressurization of the RCS. This event was bounded by Beaver Valley Unit 2 UFSAR safety analysis section 15.5, "Increase in Reactor Coolant Inventory".

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

Description of Event

On 3/22/89, Unit 2 was in Operational Mode 5 as part of its first Refueling Outage. At 0530 Hours, a Safety Injection Signal was generated. Operators verified that no conditions existed which required a Safety Injection and used the Station's Emergency Response procedures for guidance to recover the plant.

The station was in Mode 5 with "A" Train priority established at the time of this event. Train "B" had been removed from service, as per procedure. The Train "A" High Head and Low Head Safety Injection Flowpaths and the "A" Low Head Safety Injection Pump had been removed from service following entry into Mode 5. The only components initially believed to have recieved the SI signal were the "A" High Head Safety Injection Pump (HHSI) and the "A" Emergency Diesel. The "A" HHSI pump was already running in its recirculation mode at the time of the event, so the SI Start it recieved did not affect it. The "A" Diesel started as designed.

On daylight shift 3/22/89, follow-up investigation determined that one additional component had been affected by the SI signal. The Safety Injection Accumulator Check Valve Operational Surveillance Test (OST 2.11.15), had been started on 3/21/89 and was still in progress at the time of the event. The OST directed the operators to energize each Accumulator's Motor Operated Isolation Valve, then open the Isolation Valves one at a time and verify flow from each Accumulators to the Reactor Coolant System (RCS), thus functionally verifying the operability of each in-line check valve. This test had been completed for the "A" and "B" Accumulators, but could not immediately be performed for the "C" Accumulator until the Residual Heat Removal (RHR) system flow path was re-aligned from the "C" RCS loop to the "B" loop. Additionally, Operators also needed to refill the "B" Accumulator in order to use it for a pressure source for RCS Isolation Valve Disk pressurization. While the operators were waiting for these evolutions to be completed, the "B" Accumulator's Motor Operated Isolation valve was left energized with its control switch left in the "close" position. The "A" Accumulator's Isolation Valve had been de-energized following completion of its check valve test. The "C" Accumulator's Isolation Valve was still de-energized closed (normal Mode 5 system arrangement), awaiting testing. Thus, at the time of the Safety Injection Signal, only the "B" Accumulator's Isolation valve was energized. The valve opened in response to the Safety Injection Signal, as designed. This resulted in a partial discharge of the "B" Accumulator into the RCS. The "B" Accumulator was at a pressure of approximately 30 to 60 psig (due to the operators refilling it), while the RCS was at



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

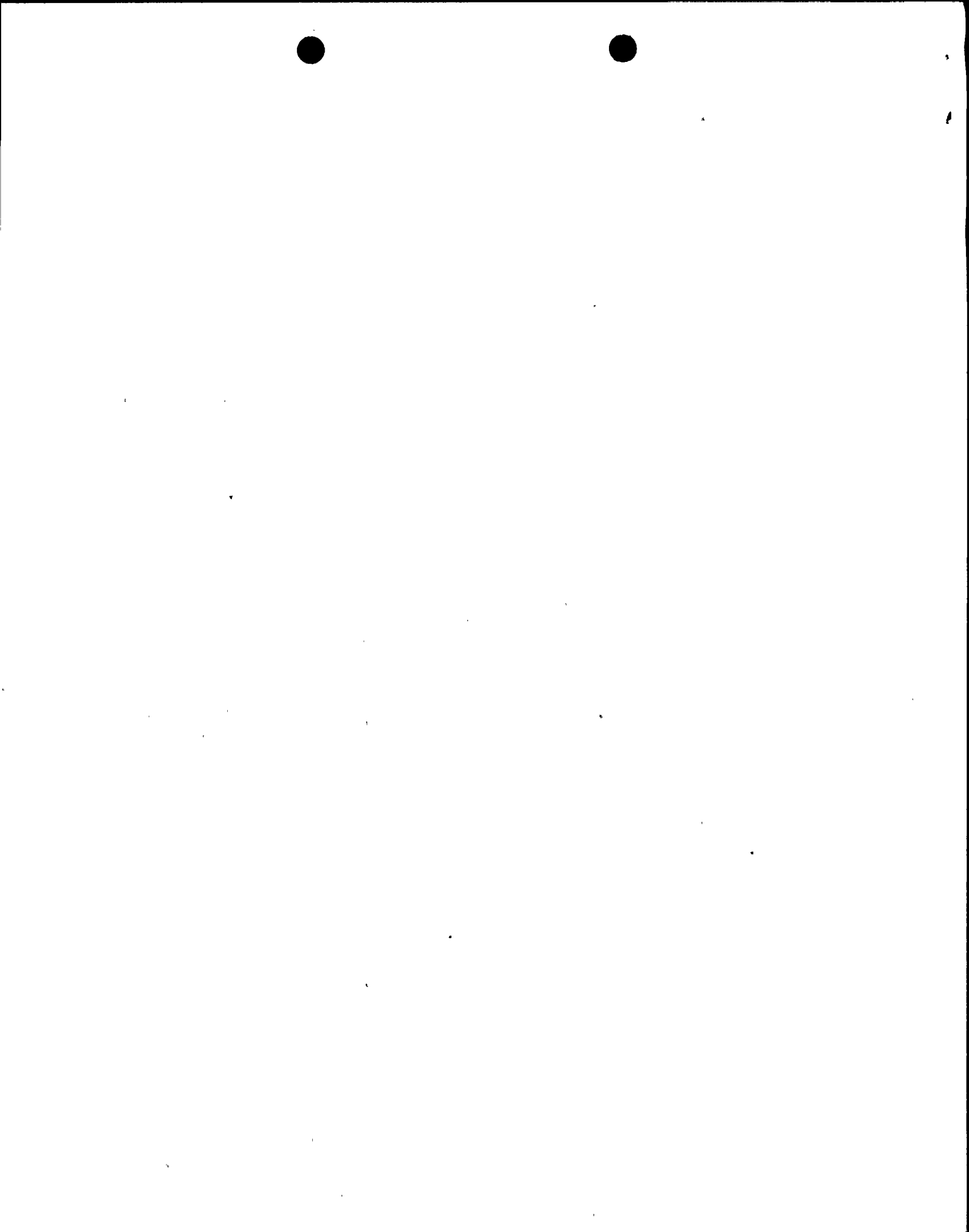
atmospheric pressure. The "B" Accumulator Isolation valve was open for approximately 5 minutes. This resulted in approximately 2400 gallons of borated water being transferred from the Accumulator into the RCS. The "B" Accumulator had been filled with greater than 10,000 gallons of borated water prior the the Safety Injection Signal.

Cause of Event

Investigation determined this event was due to deficiencies in the Safety Accumulator Check Valve Surveillance Test and the Pressurizer Pressure Channels' calibration procedures. The Surveillance Test procedure did not direct the operators to immediately de-energize closed each Accumulator's Isolation valve after the test section involving that accumulator was completed. The Pressurizer Pressure calibration procedures did not state that two channels should not be calibrated simultaneously while the RCS was below 2000 psig and the Solid State Protection System was in service.

Human error was identified as a contributing cause to this event. Operations personnel were required to review and authorize the Pressure Channel calibration procedures prior to their being initiated. The operators were aware that the one Pressurizer pressure channel was already being calibrated, but failed to realize that removing the second channel of Pressurizer Pressure from service for calibration would result in a Safety Injection signal. When the second channel was removed from service, as per its calibration procedure, its associated Low Pressure Safety Injection Block permissive bistable was placed in a "tripped" condition. The first channel's bistable was already in a tripped condition, as per its calibration procedure. With two of three channels tripped, the Low Pressure SI block was defeated, causing the Solid State Protection System to initiate a Safety Injection due to Low RCS Pressure, as per design.

A Human Performance Evaluation System (HPES) investigation was initiated in response to this incident. It identified several contributing causes to human error. In addition to the above, it noted that a major contributing cause to this event was the reliance upon a single barrier (Nuclear Shift Supervisor review) to prevent the performance of maintenance procedure under inappropriate plant conditions.



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

Corrective Actions

In response to the above, Duquesne Light has initiated the following corrective actions:

- 1) For the remainder of the current Refueling Outage, calibration procedures are to be pre-reviewed by an SRO before being submitted to the NSS for final approval. This pre-review will determine whether the procedure can be safely performed in a given plant condition and identify any special safety precautions that may be necessary. This will provide an additional barrier against Human Error.
- 2) In order to prevent similar inadvertent ESF actuations, Unit 2 has removed its Solid State Protection System (SSPS) from service. This action was not taken until after an evaluation verified that SSPS is not required to be operable in Modes 5 or 6 by either Technical Specifications or Accident Analysis. By removing SSPS from service, all Safety Injection Signals and most other ESF signals are blocked. Unit 2 is also revising its shutdown procedure to remove the SSPS from service while in Modes 5 and 6. SSPS will be maintained in a bypassed condition until required for entry into Mode 4. SSPS will be placed in service in Modes 5 or 6 only if it is required for testing or maintenance.
- 3) OST 2.11.15 will be revised to de-energize an Accumulator's Isolation Valve as soon as testing on that Accumulator is finished.
- 4) The Pressurizer Pressure calibration procedures will be revised to provide steps which will prevent removing more than one P-11 permissive at a time while below 2000 psig in the RCS. A review of other Instrumentation calibration procedures will be performed to identify similar problems. Procedures will be revised as necessary.

Safety Analysis

There were no safety concerns due to this event. The follow-up investigation determined that the "B" Accumulator was pressurized to between 30 and 60 psig (as opposed to its normal operating pressure of 600 psig), causing a transfer of water into the RCS when the isolation valve was opened. Due to the low accumulator pressure, there were no overpressurization concerns associated with this event. This event is bounded by BVPS Unit 2 UFSAR safety analysis section 15.5, "Increase in Reactor Coolant Inventory".



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An investigation was initiated in response to the concern as to whether an Unusual Event (UE) should have been declared due to this event. The station's Emergency Preparedness Plan (EPP) required a UE if water was injected into the RCS via the High Head or Low Head Safety Injection flowpaths. No such injection occurred during this event. Further investigation concluded that there was no degradation or potential degradation to the plant's safety barriers or other required safety related components due to this event. Based upon this criteria, no UE was required..

Safety Injections to Date

Beaver Valley Unit 2 had 2 Pre-operational Safety Injections. This is the third Operational Safety Injection at this Unit.





Duquesne Light

Nuclear Group
P.O. Box 4
Shippingport, PA 15077-0004

Telephone (412) 393-6000

April 21, 1989
ND3MNO:1865

Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
LER 89-005-00

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

In accordance with Appendix A, Beaver Valley Technical Specifications, the following Licensee Event Report is submitted:

LER 89-005-00, 10 CFR 50.73.a.2.iv, "Inadvertent Safety Injection".

Very truly yours,

T. P. Noonan
General Manager
Nuclear Operations

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Attachment

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cc: Mr. William T. Russell
Regional Administrator
United States Nuclear Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406

C. A. Roteck, Ohio Edison

Mr. Peter Tam, BVPS Licensing Project Manager
United States Nuclear Regulatory Commission
Washington, DC 20555
J. Beall, Nuclear Regulatory Commission,
BVPS Senior Resident Inspector

Mr. Alex Timme, CAPCO Nuclear Projects Coordinator
Toledo Edison

INPO Records Center
Suite 1500
1100 Circle 75 Parkway
Atlanta, GA 30339

G. E. Muckle, Factory Mutual Engineering, Pittsburgh

Mr. J. N. Steinmetz, Operating Plant Projects Manager
Mid Atlantic Area
Westinghouse Electric Corporation
Energy Systems Service Division
Box 355
Pittsburgh, PA 15230

American Nuclear Insurers
c/o Dottie Sherman, ANI Library
The Exchange Suite 245
270 Farmington Avenue
Farmington, CT 06032

Mr. Richard Janati
Department of Environmental Resources
P. O. Box 2063
16th Floor, Fulton Building
Harrisburg, PA 17120

Director, Safety Evaluation & Control
Virginia Electric & Power Co.
P.O. Box 26666
One James River Plaza
Richmond, VA 23261

