NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Beaver Valley Power Station, Unit 1	0 5 0 0 0 3 3 4	1 OF 0 4

TITLE (4)
Safety Injection/Reactor Trip Due to Loss of Station Instrument Air Pressure

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 8	2 9	8 5	8 5	— 0 1 5	— 0 0	0 9	2 6	8 5	N/A	0 5 0 0 0
									N/A	0 5 0 0 0

OPERATING MODE (9): 1

POWER LEVEL (10): 1 0 0

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)	X 50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)	X 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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (AREA CODE)
Robert J. Druga, Manager of Technical Services	4 1 2 6 4 3 - 5 3 0 8

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
X	B P	S E A L	I 0 7 5	Y	D	L D	C M P	G 0 3 5	N
X	B P	R L Y	A 1 0 9	N	X	L D	E H T R	M 1 7 5	N

SUPPLEMENTAL REPORT EXPECTED (14)

[ ] YES (If yes, complete EXPECTED SUBMISSION DATE) [X] NO

EXPECTED SUBMISSION DATE (15): MONTH | DAY | YEAR

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

On 8/29/85 at 1248 hours, a low station air pressure alarm was received. Operations personnel responded by starting the standby station air compressor. The reduced air pressure initially caused one Main Steam Isolation Valve to drift closed. The resultant increased steam flow caused steam line pressures to drop in the other two steam lines. The pressure drops were sufficient to actuate the rate-compensated Low Steamline Pressure Safety Injection Signal. The Safety Injection Signal caused a resultant Reactor Trip. The Control Room operators followed the applicable emergency procedures and stabilized the plant in Hot Standby. An Unusual Event was declared at 1300 hours and terminated at 1315 hours. The low station air pressure was the result of a failed solder fitting on the instrument air system. The solder fitting failed due to a faulty heater control on an instrument air dryer and improper equipment restoration. During subsequent plant recovery actions, water was found spraying from both Low Head Safety Injection Pump wedge control rod seals. Both pumps were declared inoperable which required an entry into Cold Shutdown. Postulated failure on the control rod seals was from a minor flow induced pressure transient. Following equipment repair, a plant startup to full power operations was commenced on 9/1/85.

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1/1

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Beaver Valley Power Station, Unit 1	0 5 0 0 0 3 3 4	8 5	— 0 1 5	— 0 0	0 2 OF 0 4

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

On 8/29/85 at 1248 hours, a "Station Instrument Air Receiver Pressure Low" alarm was received in the Control Room. In response to this alarm, the Control Room operators started the standby station air compressor. Additionally, operators were immediately dispatched to determine the cause of the low station instrument air pressure. Initial attempts were made to start the Emergency Diesel Air Compressor, but these attempts were unsuccessful. The postulated failure of the Emergency Diesel Air Compressor to start was the result of improper starting techniques which led to a discharged battery due to overcranking. To prevent future occurrences, additional starting instructions have been placed on the air compressor detailing proper starting techniques. During the initial recovery, a portable battery charger was jumpered onto the diesel battery and the diesel was successfully started.

The operators then proceeded to the area of the station air compressors and proceeded to isolate air to the station air system (allowing all air supply to be to the instrument air system). During the isolation, the operators discovered that the common outlet two-inch line from the instrument air dryers had separated at an elbow fitting. The operators immediately began to isolate the affected portions of the instrument air system and place in service the installed bypass air drying filters.

Due to the reduced air pressure, the main steam isolation valves (which require air to be held open) started to fall towards the closed position. The main steam isolation valve on the 1A main steamline dropped low enough for the valve to be rapidly closed by the steam flow. This caused increased steam flow to the 1B and 1C main steamlines with a corresponding drop in the steam pressures within the steamlines. The pressure drops were sufficient to actuate the Safety Injection System due to Low Steamline Pressure at 1250 hours. The Low Steamline Pressure Safety Injection Actuation Signal is rate-compensated to act as an anticipatory signal. The Safety Injection Signal caused a Reactor Trip, a Turbine Trip, the generation of Steamline Isolation signal and a Feedwater Isolation signal. The Steam Generator Atmospheric Relief Valves actuated to maintain temperature. The Control Room operators followed Emergency Operating Procedures: E-0 "Emergency Core Cooling System (ECCS) Actuation" and E-5 "Reactor Trip" to terminate and recover from the actuation of safety injection and stabilize the plant in Hot Standby. At 1258 hours, the Safety Injection Signal was reset and all non-essential equipment was placed in the standby mode.

An Unusual Event was declared due to the actuation of the Safety Injection System and the appropriate Emergency Preparedness Plan notifications were initiated. The Unusual Event was terminated after identification of the cause of the safety injection and the establishment of stable plant conditions.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Beaver Valley Power Station, Unit 1	0 5 0 0 0 3 3 4	8 5	— 0 1 5	— 0 0	0 3 OF 0 4

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

Following plant stabilization and during his normal tour, the plant operator found water leaking from the discharge head seal package area of the 1A Low Head Safety Injection Pump. It was initially thought that the seals had not seated when the pump was shut down. The pump was started (bumped) in an attempt to seat the seals. This action failed to terminate the leakage. The closing of the pump suction terminated the leakage. The 1A Low Head Safety Injection Pump was then declared inoperable and the ACTION statement of Technical Specification 3.5.2 was entered. Subsequently, water was noted leaking from what appeared to be the seal package on the 1B Low Head Safety Injection Pump. It was again thought that the seals had not seated when the pump was shut down. The pump was manually rotated in an attempt to seat the seals, but the leakage continued. The suction valve to the pump was then closed to terminate the leakage. The 1B Low Head Safety Injection Pump was then declared inoperable. This prompted an entry into Cold Shutdown at 0020 hours on 8/31/85 to comply with the ACTION statement of Technical Specification 3.5.2.

During attempts to place the Residual Heat Removal System in service, the 1A Residual Heat Removal Pump failed to start. The 1B Residual Heat Removal Pump was placed into service during troubleshooting of the starting problems on the 1A Residual Heat Removal Pump. The failure of the 1A Residual Heat Removal Pump to start was due to an overcurrent protection relay tripping on one phase ("A" phase). This relay was swapped with the "C" phase relay and the pump was successfully started. It was determined that the "A" phase draws slightly more starting current than the other two phases due to the motor characteristics and that the setting for the "A" phase relay was at the low end of its tolerance band. This relay was recalibrated and returned to service.

The cause for the failed solder fitting was due to a combination of a malfunctioning timer on the heater control for the instrument air dryer and the associated troubleshooting/repair activities. The major contributor was the malfunctioning timer while a minor contributor was the restoration of the timer after repairs were completed. To prevent future occurrences, the Station has required that guidelines involving troubleshooting and restoration of selected plant equipment be developed for implementation prior to future maintenance activities on this equipment. The heater control timer was repaired and a power transformer was replaced. The fitting was brazed along with other affected fittings and the system returned to service. A protective step was installed over this line to prevent accidental striking or impingement which could lead to a possible failure or possible line rupture.

The leakage observed from what appeared to be the seal packages of both Low Head Safety Injection Pumps was determined to be leaking from a failed O-ring and gasket assembly on several of the seismic wedge control rods that penetrate the pump casings, not the pump seals. These rods were installed under a design change package in 1980 as part of a seismic upgrade modification. These rods adjust wedges that are intermittently spaced along the shaft pump casing to dampen any vibration during a seismic event. The cause of the gasket failure is postulated to be the result of a minor flow induced pressure transient during

pump start/stop which was sufficient to blow out the gaskets and extruded two o-rings. These control rod seals normally operate under pump suction pressure. The minor pressure transient was determined to be less than or at worse cause limited to the lift setpoint of the commonly installed discharge relief valve. Since the pressure rating of this relief valve is lower than the design pressure rating of the suction piping and the pump casing, no damage to the piping/casing could have occurred due to the pressure transient. The Low Head Safety Injection Pumps were repaired by replacing all the O-rings and gaskets on each pump and ensuring that the gasket seals were properly tightened to accomodate pressure transients. After repairs, surveillance tests were performed on both pumps. No leakage was observed on either pump. The 1A Low Head Safety Injection Pump was declared operable at 0500 hours on 9/1/85, and the 1B Low Head Safety Injection Pump was declared operable at 1220 hours on 9/1/85.

Additional problems of minor significance involving the main feedwater pump discharge valve motor operators and a letdown system isolation valve were subsequently investigated and repaired.

Following the resolution of these problems, a plant startup to normal full power operations was commenced on 9/1/85 at 1500 hours with no other significant problems identified. Power Operation was achieved at 1247 hours on 9/2/85.

There were no safety implications to the public as a result of this event because all systems functioned to place the plant in a stable condition (Hot Standby).

Safety Injections to date:

19 operational
2 pre-operational

Duquesne Light

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

Telephone (412) 393-6000

September 26, 1985
ND1SS1:2551

Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
LER 85-015

Dr. Thomas E. Murley
Regional Administrator
United States Nuclear Regulatory Commission
Region 1
Park Avenue
King of Prussia, PA 19406

Gentlemen:

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

LER 85-015, 10 CFR 50.73.a.2.iv, "Automatic Actuation of Engineered Safety Feature (ESF)".

Very truly yours,

R J Druga

Wm. S. Lacey
Plant Manager

Attachment

1/1
IE 22

cc: Director of Management & Program Analysis
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