

32216

301 816 5151

FORM 361

U.S. NUCLEAR REGULATORY COMMISSION  
OPERATIONS CENTER

EVENT NOTIFICATION WORKSHEET

NOTIFICATION TIME 04/24/97 _____ hours	FACILITY OR ORGANIZATION Beaver Valley Power Station	UNIT 2	CALLER'S NAME R. VALLEJOESA	CALL BACK #: ENS of (412) 643-8002
EVENT TIME & ZONE 0606	EVENT DATE 03/19/97	1-Hr Non-Emergency 10 CFR 80.72(b)(1)		<input type="checkbox"/> (VI) Lost Offsite Comms
POWER/MODE BEFORE 100% / Mode 1	POWER/MODE AFTER 0% / Mode 4	<input type="checkbox"/> (I)(A) TS Required S/D	<input type="checkbox"/> (VII) Fire	<input type="checkbox"/> (VI) Toxic Gas
EVENT CLASSIFICATIONS		<input type="checkbox"/> (I)(B) TS Deviation	<input type="checkbox"/> (IV) Rad Release	<input type="checkbox"/> (VI) Oth Hampering Safe Op.
<input type="checkbox"/> GENERAL EMERGENCY	<input type="checkbox"/> (II) Degraded Condition	<input type="checkbox"/> (IV)(A) Unanalyzed Condition	4-Hr Non-Emergency 10 CFR 80.72(b)(2)	
<input type="checkbox"/> SITE AREA EMERGENCY	<input type="checkbox"/> (II)(B) Outside Design Basis	<input type="checkbox"/> (IV)(B) Outside Design Basis	<input type="checkbox"/> (I) Degrade White S/D	<input type="checkbox"/> (II) RPS Actuation (somn)
<input type="checkbox"/> ALERT	<input type="checkbox"/> (II)(C) Not Covered by OPA/OPs	<input type="checkbox"/> (II) Earthquake	<input type="checkbox"/> (II) ESF Actuation	<input type="checkbox"/> (IV)(A) Safe S/D Capability
<input type="checkbox"/> UNUSUAL EVENT	<input type="checkbox"/> (III) Flood	<input type="checkbox"/> (III) Hurricane	<input type="checkbox"/> (II)(B) RHR Capability	<input type="checkbox"/> (II)(C) Control of Rad Release
<input type="checkbox"/> 50.72 NON-EMERGENCY	<input type="checkbox"/> (III) Ice/Hail	<input type="checkbox"/> (III) Lightning	<input type="checkbox"/> (IV)(C) Accident Mitigation	<input type="checkbox"/> (IV)(A) Air Release > 2X App B
<input type="checkbox"/> PHYSICAL SECURITY (73.71)	<input type="checkbox"/> (III) Tornado	<input type="checkbox"/> (III) Oth Natural Phenomenon	<input type="checkbox"/> (IV)(B) Liq Release > 2X App B	<input type="checkbox"/> (V) State Medical
<input type="checkbox"/> TRANSPORTATION	<input type="checkbox"/> (IV) ECCS Discharge to RCS	<input type="checkbox"/> (IV) Lost ENS	<input type="checkbox"/> (V) Offsite Notification	
<input type="checkbox"/> 20.403 MATERIAL/EXPOSURE	<input type="checkbox"/> (V) Lost Emerg Assessment			
<input checked="" type="checkbox"/> OTHER 10CFR Part 21 Notification				

DESCRIPTION

Initial 10CFR Part 21 Notification by facsimile- see attached. Follow-up written report will be submitted in 30 days.

IERA 9

Include: Systems affected, actuations & their initiating signals, causes, effect of event on plant, actions taken or planned, etc.

NOTIFICATIONS NRC RESIDENT	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	WILL BE <input type="checkbox"/>	ANYTHING UNUSUAL OR NOT UNDERSTOOD?	<input type="checkbox"/>	YES (Explain above)	<input checked="" type="checkbox"/>	NO
STATE (s)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DID ALL SYSTEMS FUNCTION AS REQUIRED?	<input checked="" type="checkbox"/>	YES	<input type="checkbox"/>	NO (Explain above)
LOCAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MODE OF OPERATION	ESTIMATE FOR			ADDITIONAL INFO
OTHER GOV AGENCIES	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	UNTIL CORRECTED: N/A	RESTART DATE: N/A		<input type="checkbox"/>	ON BACK: <input checked="" type="checkbox"/> NO
IA/PRESS RELEASE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					

04/24/97

P21 97-331

Attachment to NRC Form 361 - Event Notification Worksheet  
Initial Notification 10CFR Part 21 - BVPS Unit 2 Auxiliary Feedwater Check Valve Failure

During the March 19, 1997 Beaver Valley Power Station (BVPS) Unit 2 trip (previously documented in Licensee Event Report 1-97-005-00, dated April 14, 1997), Auxiliary Feedwater (AFW) anomalies were observed. The AFW flow through the "B" steam generator was lower (150 vs. 280 GPM) than expected. Flow through the "A" and "C" steam generators was as expected. The performance of all three AFW Pumps was normal for the trip conditions. Subsequent inspection of the "B" steam generator check valve (2FWE-100) revealed that the seat ring had partially moved into the flow stream, decreasing the available opening for flow to pass through the valve. The three Unit 2 AFW check valves were shipped to the vendor's facility for further examination and analysis. The resulting investigation concluded that the thermal gradient conditions created by flowing cold water through the hot valve created a rapid cooldown of the seat ring, allowing it to displace. All three of the subject check valves were modified to prevent reoccurrence. The valves were then shipped back to the site and reinstalled.

The check valves are normally held shut by steam generator pressure. Failed check valve 2FWE-100, is located in close proximity to the main feedwater header, and is at approximately 430 degrees F. The other two check valves are below 300 degrees F. The differences in the temperatures are attributed to the distance and location of the valves with respect to the main feedwater header. During a reactor trip, AFW at approximately 60 degrees F is injected. It is estimated that it takes approximately 5 seconds for the seat to cool down, whereas the massive valve body stays relatively hot. It appears that the valve seat loosened because of cold water passing through the valve. The massive valve retained its shape, whereas the seat shrunk. This relative shrinkage allowed the seat to displace and move into the flow stream.

An extent of condition evaluation has shown that other Enertech nozzle check valves of this design in service at Unit 2 are not subject to thermal gradients of sufficient magnitude to induce the condition observed for 2FWE-100. Unit 1 does not have Enertech nozzle check valves.

A similar failure of AFW check valve 2FWE-100 would have resulted in a reduction of AFW flow to the "B" steam generator during a postulated design basis accident. The reduction in flow caused by the defect would have resulted in AFW flows less than analyzed for the Unit 2 Accident Analysis. Therefore, for the postulated accidents, the ability to provide adequate AFW cooling would be adversely affected and the system may not have performed its safety function.

An evaluation of this event, completed on April 24, 1997, has determined that a substantial safety hazard could be created as the result of the identified valve defect and that it is, therefore, reportable pursuant to the requirements of 10CFR Part 21.

Component Description:

The component is a nozzle check valve intended for use with water service.

Supplier:

Enertech  
(BW/IP)  
2950 Birch Street  
Brea, CA 92621

Type:

Enertech "4" Nozzle Check Valve, ANSI Class 600, Type DRV-Z

Valve Body - Dwg. # PD96227, ASME SA105  
Seat - Dwg. # PB96233, ASTM A479 Type 316