NON-PUBLIC?: N
ACCESSION #: 8901120527
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Calvert Cliffs, Unit 1 PAGE: 1 OF 5

DOCKET NUMBER: 05000317

TITLE: Loss of Watertight Integrity of Service Water Pump Room Due to Drain Line Unprotected From Backflow
EVENT DATE: 12/09/88 LER #: 88-013-00 REPORT DATE: 01/06/89

OTHER FACILITIES INVOLVED: Calvert Cliffs, Unit 2 DOCKET NO: 05000318

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(ii)

LICENSEE CONTACT FOR THIS LER:
NAME: G. L. Bell, Engineer TELEPHONE: (301) 260-3990

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: WK COMPONENT: V MANUFACTURER: X999
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO EXPECTED SUBMISSION DATE:

ABSTRACT:

On December 9, 1988, at 1330, an operator discovered that a drain line in the Calvert Cliffs Unit 1 Service Water (SRW) pump room did not have backflow protection. This protection ensures the water tight integrity of the SRW pump room to protect safety-related equipment during flooding in the turbine building. A similar deficiency was subsequently discovered in,the Unit 2 SRW pump room. Both drain valves were apparently overlooked during a facility modification initiated in 1981 to prevent backflow in all of the SRW pump room drain lines. Upon discovery, float valves were installed in both drain lines.

Corrective actions will include: a re-evaluation of the existing method for providing backflow protection and, in the interim, conducting periodic visual inspections of the float valves; investigating a way to conspicuously identify each drain float valve; and changing plant drawings to identify the location of the float valves and verifying SRW pump room drains are properly shown.

END OF ABSTRACT

I. DESCRIPTION OF EVENT

On December 9, 1988, an off-shift operator was performing a routine walkdown in the Calvert Cliffs Unit 1 Service Water (SRW) pump room (EIIS MK). His attention was drawn to a vertical section of piping that ran from the floor to the overhead with an open drainage collector near the overhead. Upon further investigation, the operator discovered that the collector did not contain any backflow protection. This protection is required to ensure the watertight integrity of the SRW pump room during flooding in the turbine building. The drain (EIIS WK-DRN) collects the discharge from the relief valve from the #11 SRW Heat Exchanger (EIIS BI HX) and drains into the main drain header. The collector is located behind a building support approximately eight feet above the floor and is not easily recognized as an equipment drain.

The operator immediately made a report of his discovery to the Shift Supervisor. Unit 1 entered into the Action Statement for Technical Specification 3.7.10.b at 1330 and preparations were made to install a float valve into the drain line. The requirements of 3.7.10.b were imposed because a violation of the watertight integrity of the SRW pump room due to the drain not having backflow protection is considered to be comparable to the inoperability of the watertight doors located in the SRW pump room. Technical Specification 3/4.7.10.b requires that the watertight doors from the SRW pump rooms shall be closed except when the door is being used for normal entry and exit. If any door is open, it must be restored to the closed position within 24 hours or the unit must be in at least Hot Standby within the next 6 hours and in Cold Shutdown within the following 30 hours.

The Technical Specification Bases states that this specification is provided to ensure the protection of safety-related equipment from the effects of water or steam escaping from ruptured pipes or components in adjoining rooms. The installation of the float valve was completed at 1610 and the Action Statement was exited. A preliminary inspection of the Unit 1 and 2 SRW pump rooms was conducted to inspect equipment drains for missing float valves. No deficiencies were noted. The Unit 2 SRW pump room does not have a similar drain.

On December 16, 1988, the System Engineer was conducting a walkdown of the drains in the Unit 2 SRW pump room. The walkdown was being conducted for both units as a continuation into the investigation of the event. It was discovered that the drain located near the SRW chemical addition tank (EIIS BI-TK) was also missing backflow protection. Unit 2 entered into the

Action Statement for 3.7.10.b at 1415. The valve installation was completed at 1800 and the Action Statement was exited.

On December 28, 1988, an engineer was conducting a walkdown of the Unit 2 SRW pump room in continuation of the event investigation, It was discovered that the float valve installed on December 16, 1988, near the SRW chemical

addition tank was inoperable. Unit 2 entered into the Action Statement for 3.7.10.b at 1150. The valve was replaced and the Action Statement was exited at 1255.

The duration of each event was the same time the Unit was placed into the Action Statement for Technical Specification 3.7.10.b. The duration of the initial event for Unit 1 on December 9, 1988, was 2 hours and 40 minutes. The duration of the second event on December 16, 1988, was 3 hours and 45 minutes. These events were reportable as required by 10 CFR 50.73(a)(2)(ii)(B) for a condition that was outside the design basis of the plant. This condition has existed since the initial construction and licensing of the plant. The duration of the third event on December 28, 1988, was 1 hour and 5 minutes. In neither case was the 24 hour limit of the Technical Specifications exceeded. There were no other components or systems which were inoperable and/or out of serv
ce which contributed to
this event. No plant systems or other component failures resulted from this event.

II. CAUSE OF EVENT

Chapter 9 of the Updated Final Safety Analysis Report (UFSAR) discusses flooding of the turbine building. This analysis postulates that internal or external flooding of the turbine condenser pit (EIIS MN-COND) will overflow and flood into the turbine building up to the 18 foot elevation level. Therefore, safety-related equipment located in the areas that are below the 18 foot elevation level and can be flooded must be protected.

In 1981 while reviewing engineering actions relative to NRC Bulletin 79-01B, it was discovered that the SRW pump room was not watertight. The floor and equipment drains located in the SRW pump room were connected to the turbine condenser pit without any means of isolation. Any flooding of the condenser pit could result in backflow through the drains and flooding of safety-related equipment in the SRW pump room. To correct this deficiency, float valves were installed in the floor and drain lines in the SRW pump rooms to prevent backflow.

Apparently, the drain lines involved in this event were overlooked during the performance of the Facility Change Request (FCR 81-1062) which was initiated November 14, 1981 to install the float valves. Several factors may have been involved in this process. The Unit 1 drain line from the SRW Heat Exchange relief valve is not shown on the plant drawings. Because of its location and height in the room, the drain is not easily recognizable. The Unit 2 drain line

from the SRW Chemical Addition Tank is located under a low platform and is not easily seen from eye level. However, the drain is identified in the plant drawings. A similar drain line is located in the Unit 1 SRW pump room but is located outside of the platform in the floor. The assumption that the Unit 2 valve was never installed is based on the visual appearance of the drain before installing the new float valve.

There are no records that state specifically which drains in the SRW pump rooms received float valves. The area and equipment drains drawing was never changed to indicate the installation of the float valves. A note on a detailed drawing for the drains was added only to indicate that the SRW pump room floor and equipment drains should have a float valve.

III. ANALYSIS OF EVENT

The SRW pump room drain float valves that were discovered missing were never installed because FCR 81-1062 was inadequately performed. The lack of detailed documentation regarding the change and failure to locate and/or identify all drains were the major reasons the deficiency was just recently discovered. We believe that changes which have been made to the FCR process since the time FCR 81-1062 was performed would have precluded this event. A project engineer and/or a system engineer is currently assigned to track a FCR from beginning to end, ensuring all aspects of the change are adequately performed. He also interfaces and coordinates design engineering, operations and other personnel, as necessary, to ensure successful completion of the FCR.

For the purposes of evaluating the safety consequences of the missing float valves, the equipment drain in the Unit 2 SRW pump room is postulated to be the most time limiting. The equipment drain at the floor of the SRW pump room (Elevation +3 feet) was connected without isolation to the condenser pit sump (Elevation -9 feet), FSAR Table 9-17A assumes that in the event of a flooding incident due to a passive failure of the circulating water expansion joint (EIIS NN-PSF), the condenser pit would be flooded and would overflow into the turbine building to an elevation of 18 feet. Without any operator action to plug the drain valve, the SRW pump room would flood

causing the inoperability of the SRW pumps and motor-driven auxiliary feedwater (AFW) pump (EIIS BA-P).

The UFSAR analysis assumes that the turbine building will be flooded by a worst-case break at the circulating water expansion joint and the circulating water (CW) pumps (EIIS NN-P) not being tripped rapidly. Assuming that the CW pumps are kept running, it would take approximately 28 minutes to flood the turbine building to the 18 foot elevation level. There are two safety-related level switches located in the condenser pit which will alarm at 3 inches in the Control Room. It is very unlikely that the CW pumps would be allowed to run 28 minutes in the event of flooding. Two level switches are also located in the SRW

pump room and alarm at five inches in the Control Room. Upon receipt of this alarm, an operator is instructed to investigate the problem. A conservative analysis assuming one 4 inch floor drain valve (+3 feet) without backflow protection with the turbine building flooded to the 18 foot elevation level has indicated that it will take approximately 21 minutes to flood the SRW pump room from the alarm setpoint (5 inches) to causing inoperability of the motor-driven AFW pump (18 inches). This should be enough time for an operator to identify and isolate the flooding drain with a plug. Therefore, there is adequate assurance that the safety of the plant and the public was not significantly compromised by the event.

IV. CORRECTIVE ACTIONS

As discussed above, float valves were installed in the SRW pump room drain lines as soon as they were discovered missing. An investigation was initiated to ensure that all the drain lines in the SRW pump rooms were protected from backflow by having float valves. It was verified that adequate instructions are included in Mechanical Preventive Maintenance procedures to ensure the control of the drain float valves when they are removed during draining of equipment in the SRW pump room.

Other actions that will be taken:

1. The existing method for providing backflow protection in the drain lines of the SRW pump room will be re-evaluated. Corrective action will be taken, as necessary, based upon the results of this analysis. In the interim, a periodic visual inspection will be conducted to ensure that the float valves are properly installed.

2. A method for conspicuously identifying each drain float valve will be investigated and implemented, as appropriate.

3. Plant drawings will be changed, as appropriate, to indicate the location of float valves. It will also be verified that all SRW pump room drains are properly indicated on plant drawings.

V. ADDITIONAL INFORMATION

There has been one previous similar event at Calvert Cliffs which involved the discovery of the loss of watertight integrity in a controlled area. Details of this event may be found in LER 81-79 for Unit 1 and LER 81-47 for Unit 2.

The 4 inch float valve that was discovered inoperable on December 28, 1988, is manufactured by General Wire Spring Company. The brand name is Flood-Guard and the model number is 4F.

ATTACHMENT 1 TO 8901120527 PAGE 1 OF 1

BALTIMORE
GAS AND
ELECTRIC

CHARLES CENTER P.O. BOX 1475 BALTIMORE, MARYLAND 21203

CALVERT CLIFFS NUCLEAR POWER PLANT DEPARTMENT
CALVERT CLIFFS NUCLEAR POWER PLANT
LUSBY, MARYLAND 20657

January 6, 1989

U.S. Nuclear Regulatory Commission Docket No. 50-317
Document Control Desk License No. DPR 53
Washington, DC 20555

Dear Sirs:

The attached LER 88-013 is being sent to you as required by 10 CFR 50.73.

Should you have any questions regarding this report, we would be pleased to discuss them with you.

Very truly yours,

L. B. Russell
Manager
Calvert Cliffs Nuclear Power Plant Department

LBR:GLB:tls

cc: William T. Russell
Director, Office of Management Information
and Program Control
Messrs: J. A. Tiernan
C. H. Cruse

*** END OF DOCUMENT ***