



Duquesne Light

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Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
Special Report

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

Gentlemen:

The following Special Report is submitted detailing the recent Alert Declaration that occurred at Beaver Valley Unit 2 following an inadvertent Carbon Dioxide discharge.

Description of Event

On August 30, 1990, post maintenance testing was performed on a carbon dioxide fire protection system discharge timer. The timer is in the control circuit of the fire protection system that protects the Beaver Valley Unit Two cable vault areas. The timer had been replaced after surveillance testing had identified it as failing to initiate the proper timed sequence of carbon dioxide discharge.

During the test, timer operation would be initiated to confirm proper timer operation. An actual carbon dioxide discharge was to be prevented by manually isolating that portion of the fire protection system affected by the timer during the test. A fire watch was stationed throughout the affected area while the test was in progress. The crew performing the test consisted of an operations supervisor, two auxiliary operators, and an Instrumentation and Control (I&C) technician. The operations supervisor had been assigned to coordinate all fire protection system testing and had performed the test during past required surveillances. The supervisor conducted a pre-test briefing with the operators, the fire watch, the I&C tech, an I&C supervisor, and a fire protection engineer. Items discussed included the nature of the test, expected audio and visual alarms, expected system response, and required restoration steps. The control room was notified of the same. It was noted that, although unexpected, the scent of the oil of wintergreen odorant in the carbon dioxide system would be an indicator of a problem and require the use of Self Contained

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Breathing Apparatus (SCBAs) and evacuation of personnel to an area of higher elevation. Since the carbon dioxide was not expected to discharge, the operators were told to be aware of any sound of gas in the piping going to the affected zone. A general page announcement was made to alert the plant personnel of the initiation of the test, as was required by the test procedure.

The fire protection system being tested consisted of a carbon dioxide tank with a master actuation valve and a manual isolation valve on its discharge. Down stream of the manual isolation valve, the system flowpath split into several zones of fire protection areas. Each zone had its own automatic isolation valve and actuation timer. On a fire protection signal from any zone, the master actuation valve at the tank is opened automatically. The zone timer opens its actuation valve after a 60 second time delay. If only one zone has a fire protection signal, carbon dioxide will only be discharged to that zone, although the other zones will have carbon dioxide pressure up to their automatic zone isolation valves.

During the test, the carbon dioxide tank was isolated, in accordance with the procedure, using the manual isolation valve at the tank. The carbon dioxide piping was then vented in order to provide a flowpath for any gas trapped downstream of the tank manual isolation valve, and upstream of the automatic zone isolation valve. Venting this piping prevented trapped carbon dioxide from discharging into the affected zones. The test then proceeded to initiate a demand signal for carbon dioxide discharge using the manual actuation pushbutton. This would actuate the timer and open the automatic zone isolation valve in series with and downstream of the tank manual isolation valve. During normal system operation, this action would cause carbon dioxide to be discharged into the cable vault areas.

Following pushbutton operation, a pre-discharge horn and flashing red alarm light was actuated, for sixty seconds, as would normally be expected. After this time delay, the zone isolation valve opened. It was then noted that there was the sound of gas rushing through the zone piping. It was also noted that frost began to form on the main gas line indicating carbon dioxide leaking through the tank isolation valve. The control room was notified of a carbon dioxide discharge by the operations supervisor located outside of the affected zone. The station standby alarm was sounded and the emergency squad was assembled. Members of the emergency squad donned SCBA masks, obtained portable oxygen monitors, and were dispatched to perform a search of the affected area. The fire watch had evacuated to a higher elevation in an unaffected building. A plant page announcement was made warning of the gas discharge and evacuation of the affected zones in addition to areas adjacent to and below the affected zone. The operators verified the fire watch to be in a

safe location, and continued to search affected areas. No personnel were found to have been affected by the gas discharge. No equipment in the area was adversely affected by the gas. The main isolation valve was checked to be closed and tightened. The carbon dioxide signal was reset, closing the zone isolation valve and terminating the gas release. It was estimated that three tons of carbon dioxide gas had been released to the east and west cable vault areas over a period of approximately 4 minutes.

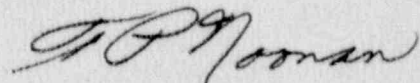
The cable vault oxygen concentration was measured by the emergency squad to be 15%. An alert was declared at 1110 hours due to a gas release resulting in oxygen concentrations in an area that were less than the Occupation Safety and Health Administration (OSHA) standard of 16% by volume - that level necessary to support life. Normal and emergency portable ventilation was established to purge the carbon dioxide from the affected areas. The emergency squad continued to survey the zones for oxygen and communicated such to the control room. Security was used to restrict access to the oxygen deficient areas.

Once all areas were verified greater than 20% oxygen, normal access was again permitted. Following a conference with all outside agencies to discuss the plant status, the alert was then terminated at 1311 hours.

The timer, which had been the focus of the test, failed to perform as required. It was replaced, and successfully tested the following day. The zone valve which opens on a demand signal was disabled by mechanically isolating the valve's pilot valve, and lifting the actuating solenoid leads. This provided double isolation to compensate for the leak through the manual tank isolation valve. A maintenance work request was generated to inspect and repair the manual isolation valve. The affected carbon dioxide tank has been drained and an alternate tank aligned to supply the fire protection system. Repairs on the valve have been scheduled.

DC/cj

Very truly yours,



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