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 FACIL: 50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylv 05000387
 50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylv 05000388

AUTH. NAME AUTHOR AFFILIATION
 FIELDS, J.S. Pennsylvania Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION
 WILKES, J.J. Pennsylvania, Commonwealth of

SUBJECT: NPDES noncompliance notification: on 901219, 20-minute discharge of circulating water into storm drains occurred during inadvertent startup of one fire pump. Test line valve apparently damaged during fire pump test.

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Pennsylvania Power & Light Company

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January 21, 1991

Mr. John J. Wilkes, Jr.
Water Quality Regional Manager
Bureau of Water Quality Management
Pennsylvania Department of Environmental Resources
90 East Union Street, 2nd Floor
Wilkes-Barre, PA 18701-3296

SUSQUEHANNA STEAM ELECTRIC STATION
FIRE PUMP TEST DISCHARGE
CCN 741326 FILE R9-8A
PLE-13646

Dear Mr. Wilkes:

Pennsylvania Power and Light Company thanks the Pennsylvania Department of Environmental Resources (Pa DER) for their timely approval to discharge Circulating Water System cooling water to the storm drains during fire pump tests once a month for a period of approximately 15 months. As we discussed in our January 11, 1991 telephone conversation, the discharge of approximately 90,000 gallons of water from fire pump tests is normally returned to the Circulating Water System by the way of a fire protection test line, however, a damaged valve has blocked this test line.

Previously I discussed with Dino Agustini of the Pa DER during a December 28, 1990 telephone conversation, that there was a 20-minute discharge of circulating water (treated river water) into the storm drains during an inadvertent start-up of one of the fire pumps on December 19, 1990. It appears that the test line valve may have been damaged during a test of one of the fire pumps on December 2, 1990. The diesel fire pump has been out of service for repair.

The attached report reviews options necessary to perform monthly tests of the fire pumps as required by station technical specifications until the valve can be repaired. The selected option until the valve can be repaired is to direct the fire pump discharge to the storm drains by way of the existing safety relief line.

Water quality data presented in table one shows that the circulating water, if discharged to the storm drains, meets a majority of the primary and secondary

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January 21, 1991

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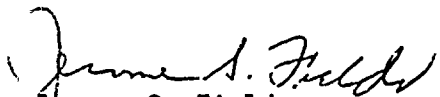
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PLE-13646
FILE-R9-8A

drinking water standards, and should not be toxic to aquatic organisms. There should be no adverse environmental impact to Lake Took-a-while.

If you have any questions or concerns, please contact me at (215) 774-7889.

Sincerely yours,



Jerome S. Fields
Sr. Environmental Scientist-Nuclear

jsf/1ta570a(25)

cc: ~~NRC Document Control Desk~~
~~NRC Region-I~~
Mr. G. S. Barber, NRC Sr. Resident Inspector
Mr. M. C. Thadani, NRC Project Manager
Mr. D. Agustini, Pa DER

010 02

FIRE PUMP TEST AND DISCHARGE TO STORM DRAINS AT THE SUSQUEHANNA STEAM ELECTRIC STATION

PROBLEM STATEMENT

On December 19, 1990, there was an accidental release of circulating water to the storm drains during an inadvertent discharge of a station fire pump. The normal fire pump test line was unavailable due to a damaged valve. It is estimated that between 50,000 and 60,000 gallons of Circulating System water (treated river water) discharged to the storm drains for a period of about 20 minutes. Also, it has been determined that when the pumps are started (planned or spuriously initiated), discharge goes to the storm drains from the safety relief line for a minute or two until pump pressure stabilizes.

Susquehanna SES Technical Specifications require a monthly test or surveillance of the fire pumps. In addition, the station's insurance company recommends weekly fire pump tests. A diesel fire pump is usually tested for 30 minutes and an electric motor driven pump for 15 minutes. The pumps are tested to ensure operability with discharge normally directed back to the Unit I Circulating Water System.

DISCUSSION

On December 9, 1990, it was identified that the fire protection test line discharge valve 0-22-038 would not open. It is thought that the disc of the gate valve had separated from its stem. The valve was declared inoperable and a weekly test was not run. It is now thought that the valve may have been damaged during a December 2, 1990, test.

The inadvertent start of the electric motor driven fire pump on December 19, 1990, was determined to have fulfilled the technical specification monthly surveillance requirement. Pump discharge of approximately 2,500 gal/min went through the safety relief valve line to the storm drains and eventually to the recreational pond Lake Took-a-while, a 24-acre pond. This pond contains about 31 million gallons of water and is located approximately one half mile east of the station. The discharge lasted approximately 20 minutes.

Normally a weekly test of the fire pumps is conducted to meet insurance company requirements and National Fire Protection Association recommendations. U.S. Nuclear Regulatory Commission station technical specifications require that the pumps be run every 31 days. By not conducting the fire pump testing, the pumps would be considered inoperable and operation of the station could be severely limited.

SOLUTION

Repairing of the fire protection test line valve 0-22-038 to allow normal fire pump test discharge back to the Unit I Circulating Water System is essential. There are three repair options each with its advantages and disadvantages.

These options are:

1. Freeze seal the fire protection line in order to isolate the valve for repair. This could be conducted during Unit I operation in the near future. However, if piping becomes embrittled and breaks, possible flooding of the Circulating Water Pump House would adversely impact operation of both units.
2. The next option is to use an inflatable seal or bladder while placing a hot tap into the line in order to repair the valve. This technique could also be conducted during Unit I operation but it has the similar disadvantages as the freeze seal method.
3. The recommended option is to wait until the next Unit I refueling outage scheduled to begin in March 1992 and repair the valve after draining the Unit I Cooling Tower Basin. This approach would ensure continued safe operation of both units. A disadvantage would be that repair of the valve could not be conducted until 1992.

In addition to the valve repair options, it is necessary to determine the possible source of water for the tests, as well as discharge options. There are two possible sources of test water and they are:

1. The first source of water is clarified water which is high purity water used in several station systems. This water is stored for emergencies in a 500,000 gallon tank, and if there is a fire pump test, (90,000 gallons) along with other station activities, there would be limited water availability onsite and this could adversely impact on station operation particularly during an emergency.
2. The second source is continued use of Circulating Water which would not impact adversely on any station systems. Fire pump discharge is normally directed back to the Circulating Water System from the fire pump tests and not to the storm drains. Table 1, Comparison of Water Quality, compares water quality of this system to drinking water parameters, river water, toxic water quality criteria, and Lake Took-a-while water quality data. Even prior to dilution in Lake Took-a-while, a majority of the primary and secondary drinking water limits, as well as fish and aquatic toxic water quality criteria are met. Impact from monthly fire pump discharges should not adversely affect this pond.

On start-up of the pumps, there is minimal discharge to the storm drains for a minute or two until the pump pressure stabilizes.

Discharge options include temporary piping from the fire pumps to the Unit II Cooling Tower Basin or discharge to the storm drain. These options are:

1. Temporary piping (fire hose) could be attached to the pump discharges and directed to the Unit II Cooling Tower Basin. A station modification may be required for this option. Potential problems include freezing of hose and possible leaks into the ground, as well as accessibility during the winter months due to ice on the cooling towers.

2. Discharge of test water to the storm drain could be continued for an interim period. This discharge is hard piped and no modifications would be required.

ACTION PLAN

In order to meet technical specification requirements, the fire pumps need to be tested monthly. The selected option includes discharge of approximately 90,000 gallons of circulating water once a month to the storm drains. This option requires no need for temporary piping or modifications to station systems and ensures the availability of clarified water for station emergencies. Water quality parameters will continue to be monitored. If there are significant changes in parameters, the monthly discharges will be discontinued and the Pennsylvania Department of Environmental Resources will be notified. In 1992, the fire protection test line valve will be repaired and only start-up discharges will normally go to the storm drains.

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TABLE 1
COMPARISON OF WATER QUALITY

PARAMETERS	UNITS	RIVER (1)	CIRC WATER (2)	LAKE T-A-W (3)	NPDES (4)	PRIMARY DRINKING WATER	SECONDARY DRINKING WATER	TOXIC (5)
Turbidity	NTU	38.00	51.00	10.20				
pH		7.00	8.10	8.00	6.85-8.7		6.50-8.5	
Conductivity	umhos	130.00	639.00	411.00				
TSS - 103 C	mg/l	119.00	106.00	12.80				
TDS	mg/l				542.5		500	
TMS (uncorr)	mg/l	100.40	459.80					
Total Hardness	mg/l	53.70	255.60	190.60				
Ca Hardness	mg/l	40.50	190.50	144.50				
PHT Alk as CaCO3	mg/l	0.00	0.00	0.00				
MO Alk as CaCO3	mg/l	34.00	121.00	81.00				
Ammonia as N	mg/l	0.16	0.19	0.12				
Nitrate as N	mg/l	0.82	3.24	1.78	3.55	10		
Sulfate as SO4	mg/l	13.90	106.00	106.00	182.5		250	
Chloride as Cl	mg/l	10.30	49.80	6.70			250	
Nitrate as NO3	mg/l	3.62	14.34	7.87				
P as PO4	mg/l	0.43	1.26	0.09				
Dissolved O2	mg/l	12.60		12.20				
Iron, Total	mg/l	3.31	5.15	0.68	2.4		0.3	
Iron, Diss	mg/l	0.09	0.63					
Manganese, Total	mg/l	0.23	0.55	0.05			0.05	
Manganese, Diss	mg/l	0.05	0.13					
Copper, Total	mg/l	< 0.02	0.02	<0.02	0.023		1	0.0065
Copper, Diss	mg/l	< 0.02	< 0.02					
Zinc, Total	mg/l	0.03	0.19	0.02				0.059
Zinc, Diss	mg/l	0.01	0.05					0.790
Nickel, Total	mg/l	< 0.05	< 0.05	< 0.05				0.088
Nickel, Diss	mg/l	< 0.05	< 0.05					
Chromium, Total	mg/l	< 0.05	< 0.05	< 0.05	< 0.05	0.05		0.131
Chromium, Diss	mg/l	< 0.05	< 0.05					
Aluminum, Total	mg/l	1.50	1.60	0.40				

PARAMETERS	UNITS	RIVER (1)	CIRC WATER (2)	LAKE T-A-W (3)	NPDES (4)	PRIMARY DRINKING WATER	SECONDARY DRINKING WATER	TOXIC (5)
Aluminum, Diss	mg/l	< 0.20	< 0.20					
Molybdenum, Total	mg/l	< 0.10	< 0.10					
Molybdenum, Diss	mg/l	< 0.10	< 0.10					
Calcium, Diss	mg/l	16.20	76.20	57.80				
Magnesium, Diss	mg/l	3.20	15.80	11.20				
Sodium, Diss	mg/l	5.70	31.10					
Potassium, Diss	mg/l	2.10	5.40					
Silicon Dioxide	mg/l	3.46	12.34	3.65				
Carbonate	mg/l	0.00	0.00	0.00				
Bicarbonate	mg/l	41.50	147.60	98.80				
Cadmium, Total	mg/l			< 0.01	< 0.005	0.05		0.0007
Lead, Total	mg/l			< 0.10	< 0.05	0.05		0.0013
Arsenic, Total	mg/l			< 0.001	< 0.01	0.01		0.19
Silver, Total	mg/l				< 0.01	0.05		0.002
Barium, Total	mg/l				< 0.01	1		
Mercury, Total	mg/l				< 0.0005	0.002		0.00001
Selenium, Total	mg/l				< 0.05			0.005

NOTES:

- (1) Susquehanna River sample below discharge on 12/5/90
- (2) Circulating System Blowdown sample on 12/5/90; if discharged to Lake Took-a-while, there would be a dilution factor of > 3000:1
- (3) Lake Took-a-while sample at Station 9-S on 11/8/90
- (4) NPDES permit application, 6/23/89; average sample analysis result of blowdown
- (5) Water Quality Criteria (Chap. 16) for toxic substances to aquatic life (metals); used hardness of 50 mg/l