

CONTROL BLOCK: (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

|   |   |   |    |   |   |   |   |   |    |    |   |   |   |   |   |    |    |   |   |   |    |     |    |   |   |   |  |   |
|---|---|---|----|---|---|---|---|---|----|----|---|---|---|---|---|----|----|---|---|---|----|-----|----|---|---|---|--|---|
| 0 | 1 | P | A  | E | V | S | 1 | 2 | 0  | 0  | - | 0 | 0 | 0 | 0 | 0  | -  | 0 | 0 | 3 | 4  | 1   | 1  | 1 | 1 | 4 |  | 5 |
| 7 | 8 | 9 | 14 |   |   |   |   |   | 15 | 25 |   |   |   |   |   | 26 | 30 |   |   |   | 57 | CAT | 58 |   |   |   |  |   |

  
CON'T

|   |   |    |   |   |   |   |   |    |    |   |   |   |   |   |    |    |   |   |   |    |    |   |   |   |   |   |
|---|---|----|---|---|---|---|---|----|----|---|---|---|---|---|----|----|---|---|---|----|----|---|---|---|---|---|
| 0 | 1 | L  | 6 | 0 | 5 | 0 | 0 | 0  | 3  | 3 | 4 | 7 | 0 | 6 | 1  | 8  | 7 | 9 | 8 | 0  | 8  | 0 | 1 | 7 | 9 | 9 |
| 7 | 8 | 60 |   |   |   |   |   | 61 | 68 |   |   |   |   |   | 69 | 74 |   |   |   | 75 | 80 |   |   |   |   |   |

  
EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 | A special radiographic inspection of the three steam generator nozzle-to feedwater

0 3 | inlet piping welds was conducted June 15, 16 and 18. The radiographs showed

0 4 | cracking to be present in all three inlet elbows. The elbows are 90 degrees

0 5 | 16 inches in diameter with an 0.843 inch wall thickness. The cracks originated at

0 6 | the shoulder of the counterbore in the piping, or approximately 9/16 inch from

0 7 | the root of the weld.

|   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 0 | 9 | C | H  | 11 | E  | 12 | B  | 13 | P  | I  | P  | E  | X  | X  | 14 | E  | 15 | Z  | 16 | 12 | 7  | 9  | 0  | 1  | 4  | 0  | 1  | T  | 1  |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |

  

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| A  | 18 | Z  | 19 | Z  | 20 | Z  | 21 | 0  | 0  | 0  | 0  | Y  | 23 | N  | 24 | A  | 25 | X  | 9  | 9  | 9  | 26 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 |    |

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 | Based on preliminary analysis, the cause appears to be fatigue failure assisted by

1 1 | corrosion. The feedwater piping elbows have been removed and are being replaced

1 2 | with new elbows. Radiographic inspection of feedwater piping welds in containment

1 3 | was completed. A total of 13 welds were found to have indications. All of these

1 4 | welds have been repaired.

|   |   |   |    |    |    |    |    |     |    |    |    |                    |    |
|---|---|---|----|----|----|----|----|-----|----|----|----|--------------------|----|
| 1 | 5 | G | 28 | 0  | 0  | 0  | 29 | N/A | 30 | C  | 31 | Special Inspection | 32 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15  | 16 | 17 | 18 | 19                 | 20 |

  

|   |   |   |    |    |    |     |    |     |    |
|---|---|---|----|----|----|-----|----|-----|----|
| 1 | 6 | Z | 33 | Z  | 34 | N/A | 35 | N/A | 36 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13  | 14 | 15  | 16 |

  

|   |   |   |    |    |    |    |    |     |    |
|---|---|---|----|----|----|----|----|-----|----|
| 1 | 7 | 0 | 0  | 0  | 37 | Z  | 38 | N/A | 39 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15  | 16 |

  

|   |   |   |    |    |    |     |    |     |    |
|---|---|---|----|----|----|-----|----|-----|----|
| 1 | 8 | 0 | 0  | 0  | 40 | N/A | 41 | N/A | 42 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13  | 14 | 15  | 16 |

  

|   |   |   |    |     |    |     |    |     |    |
|---|---|---|----|-----|----|-----|----|-----|----|
| 1 | 9 | Z | 42 | N/A | 43 | N/A | 44 | N/A | 45 |
| 7 | 8 | 9 | 10 | 11  | 12 | 13  | 14 | 15  | 16 |

  

|   |   |   |    |     |    |     |    |     |    |
|---|---|---|----|-----|----|-----|----|-----|----|
| 2 | 0 | N | 44 | N/A | 45 | N/A | 46 | N/A | 47 |
| 7 | 8 | 9 | 10 | 11  | 12 | 13  | 14 | 15  | 16 |

NAME OF PREPARER J. A. Werling

PHONE: 412-643-1258

7 908 130 438

NRC USE ONLY

Attachment To LER 79-14/01T  
Beaver Valley Power Station  
Duquesne Light Company  
Docket No. 50-334

On May 31, 1979 during a telephone conversation with Messrs. J. A. Werling, BVPS Unit 1 Superintendent, and A. C. Mazukna, Duquesne Light Company Quality Control Supervisor, Mr. D. Beckman, NRC Inspector, discussed the finding of cracks in feedwater piping adjacent to the steam generator nozzle to feedwater piping weld at another power plant. Mr. Beckman asked if Beaver Valley Power Station would voluntarily radiograph these welds during the station's current shutdown. The BVPS Superintendent agreed to do so and the work was scheduled.

Radiographs were taken on June 13, 16, and 18, 1979 of the three steam generator nozzle-to-feedwater inlet piping welds.

The radiographs showed cracking to be present in all three inlet pipes. The inlet piping at these locations are 90° elbows. The lines are 16 inches in diameter with an 0.843 inch wall thickness. In each instance, the cracks originated at the shoulder of the counterbore in the piping, or approximately 9/16 inch from the root of the weld.

Measuring in a circumferential and clockwise direction and facing the flow, the specific locations and size of the cracks are as follows. The measurements of 0 and 51 inches are at the top of the pipe; 13 at 90°; 25-26 at the bottom; and 38 at 270°.

| <u>Steam Generator No. 1A</u> | <u>Steam Generator No. 1B</u> | <u>Steam Generator No. 1C</u> |
|-------------------------------|-------------------------------|-------------------------------|
| Cracks were present at:       | Cracks were present at:       | Cracks were present at:       |
| 49 1/2" through 0 to 2"       | 48" through 0 to 2"           | 48" through 0 to 5"           |
| 10 1/2" to 15"                | 9" to 13"                     | 26" to 30" in a suck-up       |
| 39" to 41"                    | 33" to 43"                    | area of the root pass         |
|                               |                               | 35" to 43"                    |

A magnetic particle examination of the affected areas did not show any cracking to be present on the outside surface of the piping.

All three elbows have been removed from the feedwater lines and a four inch ring specimen which contains the defect has been obtained from each line. The observed defects appear to be similar to those which have previously been discovered at the DC Cook and HP Robinson Plants. The C Loop ring sample was provided to the Westinghouse Electric Corporation for metallographic examination.

The entire ring sample from the B loop was forwarded to Steen Engineering, Inc. at the request of G. Walton of Region I. The sample from the A loop is being retained at the site for possible future examination.

In accordance with IE Bulletin 79-13, a radiographic examination of all welds in the feedwater lines inside the Reactor Containment Building has been performed. This examination was performed in accordance with ASME Section III requirements as described in Action 1.a of the bulletin.

A total of 13 welds were found to have indications that required further evaluation. We have decided to repair all thirteen (13) welds that exhibited indications, even though these welds would be acceptable by the inspection requirements of ANSI B.31.1 which is the governing code under which the piping was installed.

An instrumentation program for the feedwater lines adjacent to the steam generator nozzles will be developed by the Duquesne Light Company in cooperation with the Westinghouse Electric Corporation. This program will be developed taking cognizance of the adequacy and reliability of the data obtained from similar programs which are underway at other facilities.

The instrumentation required to implement the program will be provided and installed during the fall refueling outage which will commence after approximately six full power weeks of operation after startup have been achieved.

A summary description of the instrumentation program will be provided to the NRC prior to its implementation and informal, periodic reports will be provided during the conduct of the program. A full formal report will be provided upon the completion of the program.

The replacement elbows on the feedwater lines are provided with a 1/2" radius at the counterbore to eliminate the sharp discontinuity on the inner diameter of the line, at which point the cracks on the original elbows were initiated.

Minor pitting and machine groove have been removed from the inside surface of all three (3) steam generator nozzles. It was required to perform a weld build-up on the inside surface of the "C" Steam Generator nozzle to restore the required wall thickness.

A radiographic examination of the root pass of the nozzle welds was conducted during the installation of the elbows. The pre heat temperature was not maintained during the radiography since the temperature was detrimental to the film being used.

The weld repair on the feedwater line elbows was stress relieved at 1150°F for two hours upon completion of the repair. Radiographic and Ultrasonic examination of the nozzle weld will be performed subsequent to the stress relieving operation.

The nozzle weld on the 'C' Steam Generator will be reexamined by RT and UT at the fall refueling outage and similar examinations will be conducted on all three steam generator nozzle welds at the following refueling.

A research of the operating records discloses that the oxygen content of the feedwater has been maintained at less than 5 ppb except for the following:

- a) During station start-up, shutdowns, and large transients.
- b) During a three week period in early 1979, the O<sub>2</sub> content was as great as 30 ppb due to air leakage on the condenser.

561 227

Hydrazine is added to the feedwater at the condensate pump discharge for oxygen control and morpholine is added at the same point for pH control. The condenser utilizes stainless steel tubes, and except for two or three cases of mechanical damage caused by loose baffles at points of entry of recirculation lines and steam dumps, the integrity of the main condenser has been excellent. The occurrence of mechanical damage was quickly detected and the unit was removed from the line in a timely manner to effect the necessary repairs. In general, the chemistry control of the feedwater has been maintained in accordance with the recommendations of the Westinghouse Electric Corporation, and the condenser tube integrity has been excellent.