

Attachment to LER 81-91/01X-1
Beaver Valley Power Station
Duquesne Light Company
Docket No. 50-334

On 10/29/81 at 1320 hours, a fire line break, in a redundant underground 12 inch supply header between fire system valves [FP-5] and [FP-11], resulted in the temporary loss of the Fire Protection Water System.

From the results of an analysis of the broken pipe section, performed by the Industrial Testing Laboratory (ITL), it was concluded that the break had occurred from a slight bending moment being applied to the pipe, in an area that was greatly weakened by external finger corrosion. The moment required for fracture was much less than expected to fracture the pipe due to the corrosion present. The corrosion was apparently not stress corrosion because cracking was not the form, nor was it from an electrolytic mechanism. The bituminous coating was breached in "spots" on the pipe bottom and was almost continuously missing from the top and grades in between. It was concluded that the origin of the corrosion must have originated in the pipe bedding material.

Subsequent to this incident, on 9/8/82 another segment of the fire line failed. Pipe segments were sent to ITL for analysis. Their conclusions to the mode of failure paralleled initial engineering observations that crack initiation at the break site resulted from over torquing of retainer flange setscrews upon initial installation of the line. Crack growth then continued due to bedding erosion caused by leakage from the crack and that this bedding erosion coupled with an already induced crack resulted in the complete failure. External finger corrosion which had greatly reduced the pipe wall thickness causing the incident which led to this LER was not evident. Because no connection was drawn between these most recent pipe failures, the station does not feel that a total piping replacement of the cast iron fire line is warranted at this time.