

Licensee/Facility:

Notification:

Arizona Public Service Co.  
Palo Verde 3  
Wintersburg, Arizona

MR Number: 5-93-0040  
Date: 06/09/93  
RI PHONE CALL TO RV

Dockets: 50-530  
PWR/CE80

Subject: CHARGING PUMP BLOCK CRACK

Reportable Event Number: N/A

Discussion:

On June 3, 1993, during maintenance to repair a packing leak on Unit 3 charging pump A, the licensee discovered a crack in the pump block. The crack was significant because this block was a new style, manufactured from 17-4PH forged steel. There are currently 11 blocks manufactured with this high-strength material in service, nine at Palo Verde and one each at St. Lucie 1 and Waterford. This is the second failure of this type of block-both failures have occurred at Palo Verde. The pump block, referred to as a "superblock" at Palo Verde, was provided by Combustion Engineering (CE). The vendor for the charging pumps at Palo Verde was Gaulin, and the pumps are the positive displacement design.

The crack in the Unit 3 pump block occurred after almost 18,000 run hours, and started at the discharge check valve bore and ran along the plunger bore for about six to seven inches. The only other crack of a "superblock" occurred in Unit 1 in April 1991 after only 6,700 run hou

rs.

The licensee considered the April 1991 failure to be random, and no additional corrective actions were taken. The other pumps in all three units at Palo Verde have run hours ranging from a low of 9,536 to a high of 21,754 hours.

CE conducted a study in 1989 to investigate the possibility of a catastrophic failure of the charging pumps due to high cycle fatigue failure. The study concluded that a crack of this nature would take about one month to grow to a size where pump leakage would be greater than the acceptance criteria (4.4 gpm). Therefore, it appears unlikely that the pumps would fail catastrophically from this condition.

The licensee replaced the pump block with another "superblock" and returned the pump to service on June 6th. The licensee is working with CE and a local independent analyst to determine the root cause of failure and appropriate corrective actions.

Regional Action:

The NRC resident inspectors will monitor licensee action as part of routine inspection activity.

Contact: Howard Wong (510) 975-0296  
Jim Sloan (602) 386-3638