



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REGARDING CLOSEOUT OF IE BULLETIN 79-15

DEEP DRAFT PUMP DEFICIENCIES

CONSUMERS POWER COMPANY

BIG ROCK POINT

DOCKET NO. 50-155

INTRODUCTION

On July 11, 1979, the NRC issued IE Bulletin No. 79-15 informing all licensees that Commonwealth Edison Company had identified manufacturing deficiencies in high pressure core spray, low pressure core spray, and residual heat removal pumps manufactured by Ingersoll-Rand (I-R) Company, Cameron Pump Division. The bulletin asked licensees to determine if pumps of similar construction were used in their facilities, and, if so, whether the same deficiencies could exist.

In NUREG/CR-3049: "Closeout of IE Bulletin 79-15: Deep Draft Pump Deficiencies," the NRC staff and its contractor summarized the industry effort and closed out the issue with the exception of the following facilities and types of pumps:

1. Beaver Valley Unit 1: Two Johnston auxiliary river water pumps.
2. Indian Point Units 2 and 3: Two I-R containment recirculation pumps in each plant.
3. Maine Yankee: Three Byron-Jackson containment spray pumps.
4. Nine Mile Point Unit 1: Four Worthington core spray and two Worthington emergency service water pumps.
5. Oyster Creek Unit 1: Four Byron-Jackson emergency service water pumps and two Layne-Bowler diesel driven fire protection pumps.
6. Three Mile Island Unit 1: Fourteen Peerless pumps used for river water and fire protection purposes.
7. Hatch Unit 2: Two I-R core spray pumps.
8. Big Rock Point: Two Worthington pumps used for fire protection purposes.
9. Palisades: Three Worthington pumps used for fire protection purposes.

DISCUSSION

Based on the staff's review of related NRC inspection reports, the issue was closed for Beaver Valley Unit 1, Oyster Creek Unit 1, and Hatch Unit 2. For the remaining facilities listed above, the staff requested additional information needed to complete its review. The required additional information requested from the above mentioned facilities included the following:

1. The type and application of the pumps in question.
2. Drawings, sectional assemblies and parts list of the pumps in question.
3. Applicable P&IDs of the pumps in question.
4. Detailed maintenance history of the pumps in question.
5. Testing requirements, procedures and results for both hydraulic and vibration parameters in recent years for the pumps in question.

The manufacturing deficiencies identified by IE Bulletin 79-15 can be summarized into three areas: assembly error, out of specification clearance, and damaged parts. Although all three deficiencies will eventually cause degradation in pump performance, degradation sufficient to influence pump performance might not be detected early in the service life of the pump.

NUREG/CR-3049 proposed a long running time (48 to 72 hours) on a selected sample pump in each plant to determine whether deficiencies of the types identified in Bulletin 79-15 existed in those pumps. However, because no two pumps are identical, these sample runs might not identify deficiencies in all pumps. The method proposed in NUREG/CR-3049 might detect some deficiencies early. In some cases, these runs can only be performed in mini-flow conditions which might cause more damage to the pumps other than that arising from potential deficiencies. Review of the submitted information leads the staff to conclude that periodic surveillances, such as those required by inservice testing or technical specification surveillance requirements, provide the most effective means to detect the Bulletin 79-15 deficiencies. An examination of test results from periodic surveillances provides an adequate method to detect performance degradation and to identify any detrimental effects identified in Bulletin 79-15. If the records from the past five years do not reveal any sign of performance degradation, it can be concluded that the pump will not experience any adverse effects from these types of deficiencies.

For the following facilities, the licensees have taken the corrective actions described below to ensure that the deficiencies identified in Bulletin 79-15 do not adversely impact the pumps in their facilities.

1. Indian Point Unit 2: The two containment recirculation I-R pumps are tested regularly in accordance with the ASME Section XI inservice testing requirements. Test results collected from 1981 to 1989 show no sign of performance degradation. Maintenance records since 1974 indicate both pumps needed little maintenance. On the basis of these results, the staff has concluded that the two I-R pumps are not adversely affected by the Bulletin 79-15 deficiencies. The issue is resolved for Indian Point Unit 2.

2. Indian Point Unit 3: The two containment recirculation I-R pumps are tested regularly in accordance with the ASME Section XI inservice testing requirements. Maintenance records indicate that one of these pumps was rebuilt extensively after it failed one of these tests. Other test results collected from 1978 to 1989 show no sign of performance degradation. On the basis of these results, the staff has concluded that the two I-R pumps are no longer adversely affected by the Bulletin 79-15 deficiencies. The issue is resolved for Indian Point Unit 3.
3. Maine Yankee: The three Byron-Jackson pumps were periodically surveillance tested in accordance with the ASME Section XI inservice testing requirements. Test data collected between 1984 and 1989 indicate no performance degradation in those pumps. On the basis of these results, the staff concluded that the Bulletin 79-15 deficiencies do not adversely impact these pumps. The issue is resolved for Maine Yankee.
4. Nine Mile Point Unit 1: The six Worthington pumps were tested regularly in accordance with the ASME Section XI inservice testing requirements. Maintenance records show that two core spray pumps, 111 (05-1985, 03-1986), and 112 (05-85, 08-85, 03-87) were rebuilt several times. The surveillance requirements were able to detect the deficiencies on a timely basis. Recent test results show no sign of performance deterioration. The staff has concluded that the Bulletin 79-15 deficiencies have been adequately addressed for these pumps. This issue is resolved for Nine Mile Point Unit 1.
5. Three Mile Island Unit 1: The issue was closed out in NPC Inspection Report 80-29. However, due to some miscommunication, it was erroneously reopened in NUREG/OR-3049. A recent discussion determined that all 14 Peerless pumps were tested regularly, and a typical surveillance example of three nuclear service river water pumps was examined by the NPC staff. Recent test results show no indication of performance degradation in any of these pumps. On the basis of these results, the staff concluded that the Bulletin 79-15 deficiencies do not adversely impact these pumps. The issue is resolved for Three Mile Island Unit 1.
6. Big Rock Point: Technical specification surveillance requirements require periodic testing on these two fire service pumps to verify their operability. Test data collected from the past five years show no signs of performance degradation. On the basis of these results, the staff concludes that the Bulletin 79-15 deficiencies do not adversely impact these pumps. The issue is resolved for Big Rock Point.
7. Palisades: Since the three fire protection pumps do not fall within the scope of ASME Section XI inservice testing requirements, their operability was verified by technical specification surveillance requirements. Results from the past five years show no noticeable degradation in performance. On the basis of these results, the staff concluded that the Bulletin 79-15 deficiencies do not adversely impact these pumps. The issue is resolved for Palisades.

CONCLUSION

One of the more important functions for surveillance testing is to detect deficiencies early, so that proper corrective action can be taken before a component becomes inoperable. Periodic surveillance is especially effective when a slow deteriorating process is taking place. For the types of deficiencies identified by Bulletin 79-15, all affected pumps have been tested many times since the issue was identified. Some pumps were found with deficiencies requiring extensive repairs of the pumps. Maintenance records indicate that all identified deficiencies were adequately corrected. Other pumps have undergone periodic surveillances with no detrimental effects being identified.

Because pump surveillance is a continuous requirement that applies to all affected pumps, the staff believes that the types of deficiencies identified in Bulletin 79-15 which could result in potential pump failures have been heretofore detected. Therefore, the staff concludes that an adequate basis exists to resolve the safety concerns identified in Bulletin 79-15 and thus Bulletin 79-15 is considered closed.

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