

Jim McKnight
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

September 26, 1994

NRC INFORMATION NOTICE 94-67: PROBLEM WITH HENRY PRATT MOTOR-OPERATED BUTTERFLY VALVES

Addressees

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to a problem with Henry Pratt motor-operated butterfly valves that can lead to the decoupling of the valve operator from the valve stem. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

On October 17, 1993, the Duquesne Light Company conducted a full flow surveillance test on a recirculation spray pump at Beaver Valley Power Station, Unit 2. The pump did not establish adequate flow or discharge pressure during the test. The licensee found that the pump suction valve was shut, though the annunciator in the control room indicated it fully open. As the result of the investigation, the licensee found that the valve operator had decoupled from the valve stem, allowing the operator to move independently of the valve. Two of the three other recirculation pump suction valves were starting to decouple because the valve spline adapters separated from the operator drive sleeves.

On December 10, 1993, the licensee reported to NRC in accordance with the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance," that the recirculation pump suction valve disc could disengage from the motor-operator which could cause the recirculation spray system to operate in an unacceptable manner.

Discussion

The recirculation spray pump suction valves at Beaver Valley Unit 2 are 12 inch nominal size Henry Pratt 1400 series butterfly valves with Limitorque HBC-1 operators. The drive sleeve on a Limitorque HBC valve operator rotates a spline adapter. The spline adapter is keyed to the valve stem, but the key does not prevent the adapter from moving down the valve stem toward the valve.

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updated on 9/10/95

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If the spline adapter slips down the valve stem, it will disconnect from the drive sleeve. On a Henry Pratt valve, the spline adapter is held in position by an adapter plate, which is designed to permit passage of the valve stem, but not the spline adapter. Additionally, the valve bonnet plate, which is located below the adapter plate, is designed the same way. The adapter plates and bonnet plates were designed and manufactured by Henry Pratt.

Duquesne Light Company found that the center holes in the valve bonnet plates and adapter plates were about 1.3 cm [0.5 inches] larger (in diameter) than the corresponding design dimensions. This was sufficient to allow the spline adapters to slip down the valve stem during operation of the valve. This is shown in Figure 1.

The licensee checked all 54 Henry Pratt butterfly valves at the Beaver Valley Nuclear Power Station for proper adapter plate and bonnet plate dimensions. No problems were noted beyond the recirculation pump suction valves. The licensee placed temporary spline adapter retaining clamps on the recirculation spray pump suction valves pending permanent modification.

Related Generic Communications

The NRC discussed a separate root cause of decoupling of a valve from its motor-operator in NRC Office of Inspection and Enforcement (I&E) Circular 80-12, "Valve-Shaft-to-Actuator Key May Fall Out of Place When Mounted Below Horizontal Axis," dated May 14, 1980, and I&E Information Notice 85-67, "Valve-Shaft-to-Actuator Key may fall out of Place When Mounted Below Horizontal Axis," dated August 8, 1985.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

Brian K. Grimes, Director orig /s/'d by CIGrimes/for
 Division of Operating Reactor Support
 Office of Nuclear Reactor Regulation

Technical contacts: Scot A. Greenlee, RI (412) 643-2000
 Thomas G. Scarbrough, NRR (301) 504-2794

Attachments:

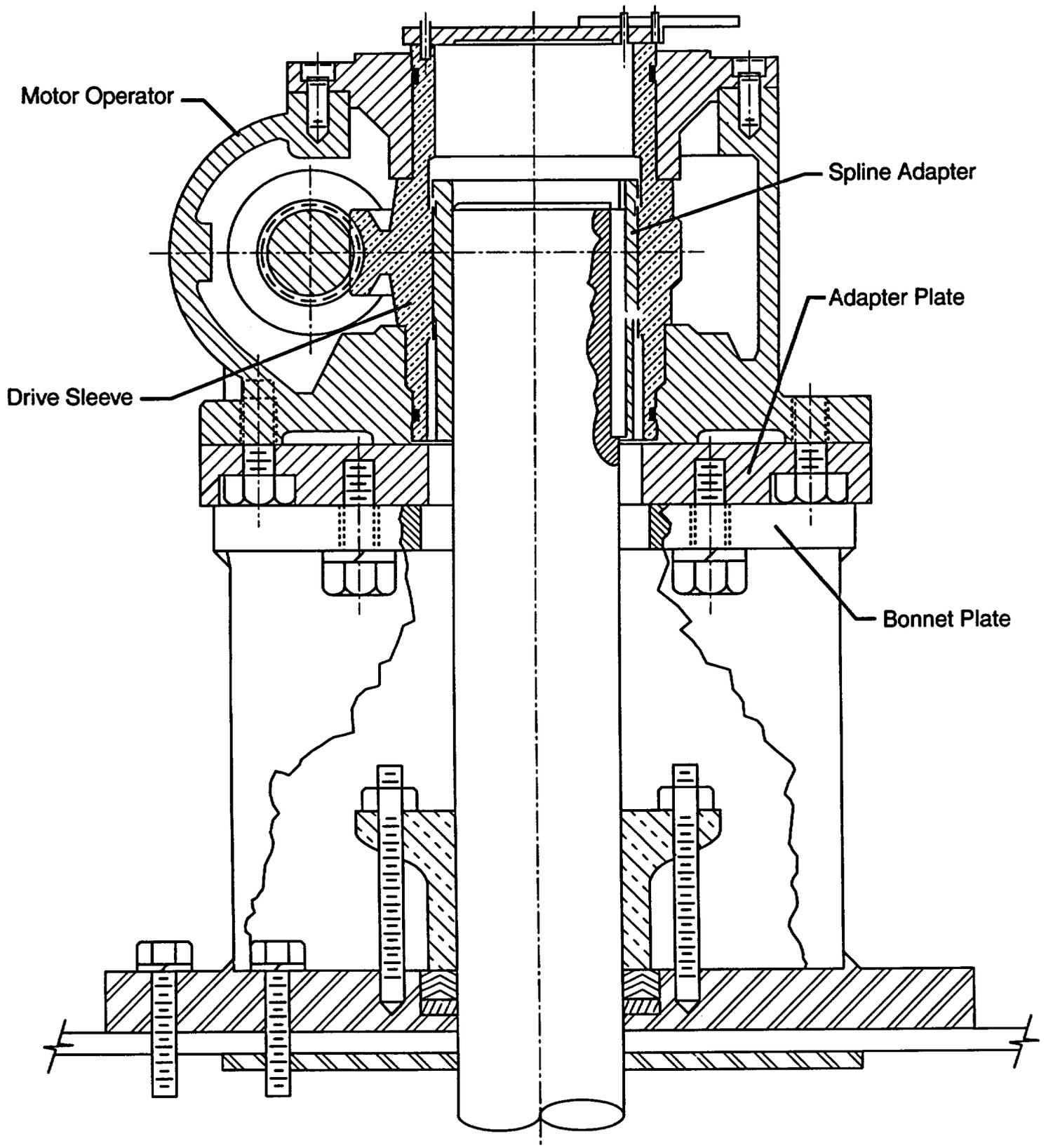
1. Figure 1 - Henry Pratt Butterfly Valves With Limitorque Motor Operator
 2. List of Recently Issued NRC Information Notices
- * see WDLanning memo to AJKugler date May 26, 1994 and previous concurrence sheets DOCUMENT NAME: 94-67.IN

**ATTACHMENTS
 FILED IN JACKET.**

| | | | | |
|--------|-------------|--------------|-------------|--------------------|
| OFFICE | *Region I | *Region I | *Region I | *OGCB/NRR |
| NAME | SAGreenlee | JCLinville | WDLanning | RJKiessel |
| DATE | 7/13/94 | 5/25/94 | 5/25/94 | 7/11/94 |
| OFFICE | *Tech. Ed. | *EMEB/NRR | *C:EMEB/NRR | *D:DE/NRR |
| NAME | JMain | TGScarbrough | RHWessman | BWSheron |
| DATE | 7/12/94 | 7/31/94 | 8/ 2/94 | 8/ 9/94 |
| OFFICE | *C:RVIB/NRR | *D:DRIL/NRR | *C:OGCB/NRR | D:DORS/NRR |
| NAME | LJNorrholm | CERossi | ELDoolittle | BKGrimes <i>CG</i> |
| DATE | 8/ 8/94 | 8/ 9/94 | 8/20/94 | 09/20/94 <i>kr</i> |

Figure 1

Henry Pratt Butterfly Valve
with Limitorque Motor Operator



LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

| Information Notice No. | Subject | Date of Issuance | Issued to |
|------------------------|---|------------------|--|
| 94-66 | Overspeed of Turbine-Driven Pumps Caused by Governor Valve Stem Binding | 09/19/94 | All holders of OLs or CPs for nuclear power reactors. |
| 94-65 | Potential Errors in Manual Brachytherapy Dose Calculations Generated Using a Computerized Treatment Planning System | 09/12/94 | All U.S. Nuclear Regulatory Commission medical licensees. |
| 94-64 | Reactivity Insertion Transient and Accident Limits for High Burnup Fuel | 08/31/94 | All holders of OLs or CPs for nuclear power reactors and all fuel fabrication licensees. |
| 94-63 | Boric Acid Corrosion of Charging Pump Casing Caused by Cladding Cracks | 08/30/94 | All holders of OLs or CPs for pressurized water reactors. |
| 94-62 | Operational Experience on Steam Generator Tube Leaks and Tube Ruptures | 08/30/94 | All holders of OLs or CPs for pressurized water reactors. |
| 94-61 | Corrosion of William Powell Gate Valve Disc Holders | 08/25/94 | All holders of OLs or CPs for nuclear power reactors. |
| 94-60 | Potential Overpressurization of Main Steam System | 08/22/94 | All holders of OLs or CPs for pressurized-water reactors. |
| 94-30, Supp. 1 | Leaking Shutdown Cooling Isolation Valves at Cooper Nuclear Station | 08/19/94 | All holders of OLs or CPs for nuclear power reactors. |
| 94-59 | Accelerated Dealloying of Cast Aluminum-Bronze Valves Caused by Microbiologically Induced Corrosion | 08/17/94 | All holders of OLs or CPs for nuclear power reactors. |

OL = Operating License
 CP = Construction Permit

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1. Figure 1 - Henry Pratt Butterfly Valves With Limitorque Motor Operator
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* see WDLanning memo to AJKugler date May 26, 1994
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| NAME | LJNorrholm | RLSpessard | EELittle | BKGrimes |
| DATE | 8/ 8/94 | 8/ 9/94 | 8/30/94 | 8/ /94 |

Document Name: G:\RJK\NRCINS\NRCIN.461

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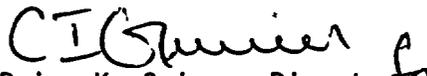
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