



UNIVERSITY OF MISSOURI

Research Reactor Facility

August 29, 1980

Research Park  
Columbia, Missouri 65211  
Telephone (314) 882-4211

Director of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Reference: Docket 50-186  
University of Missouri  
License R-103

Subject: Report as required by Technical  
Specification 6.1.h(2)

- Enclosures:
- (1) Letter to the Directorate of Licensing from MURR dated June 20, 1975.
  - (2) Letter to Scovill Fluid Power Division from MURR dated March 13, 1975.
  - (3) Letter to MURR from Scovill Fluid Power Division dated May 13, 1975.
  - (4) Letter to MURR from Scovill Schrader Bellows Division dated August 21, 1980.

Description

At 2230 on August 3, 1980, the primary inlet isolation valve (valve 507B) failed to shut when securing the primary system following a reactor shutdown. This was in violation of Technical Specification 3.9.a requiring the primary coolant isolation valves to be operable when operating the reactor in Modes I or II.

Analysis

All primary remotely operated valves at the University of Missouri Research Reactor are operated valves controlled by Schrader Bellows Type 972S three-way solenoid valves. When the operator attempted to shut valve 507B while securing the primary system following a reactor shutdown, the valve failed in the open position. The cause of the failure was the separation of the lower seal from the metal insert in valve 507B's Schrader valve and the consequent blockage of

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the exhaust port. This failure has occurred in the past as described in a letter to the Directorate of Licensing dated June 20, 1975 (Enclosure 1) and a letter from the University of Missouri to Scovill Fluid Power Division dated March 13, 1975 (Enclosure 2). The valve was operated by manually venting off the Schrader valve.

When this type of failure was previously identified, a temporary corrective measure of gluing the seal to the brass insert as described in the letter from Scovill Fluid Power Division to the University of Missouri dated May 13, 1975 (Enclosure 3) was taken. The permanent corrective action was a new smaller bottom seal design by the manufacturer (See drawing on page 3.). However, they also continued to make valves of the previous design but MURR was not informed of this. The Schrader type 972S valve that operated valve 507B was a valve installed on December 18, 1979 which had been sent to us with the older large bottom type seal installed. The valve was last operated satisfactorily on the July 28, 1980 shutdown.

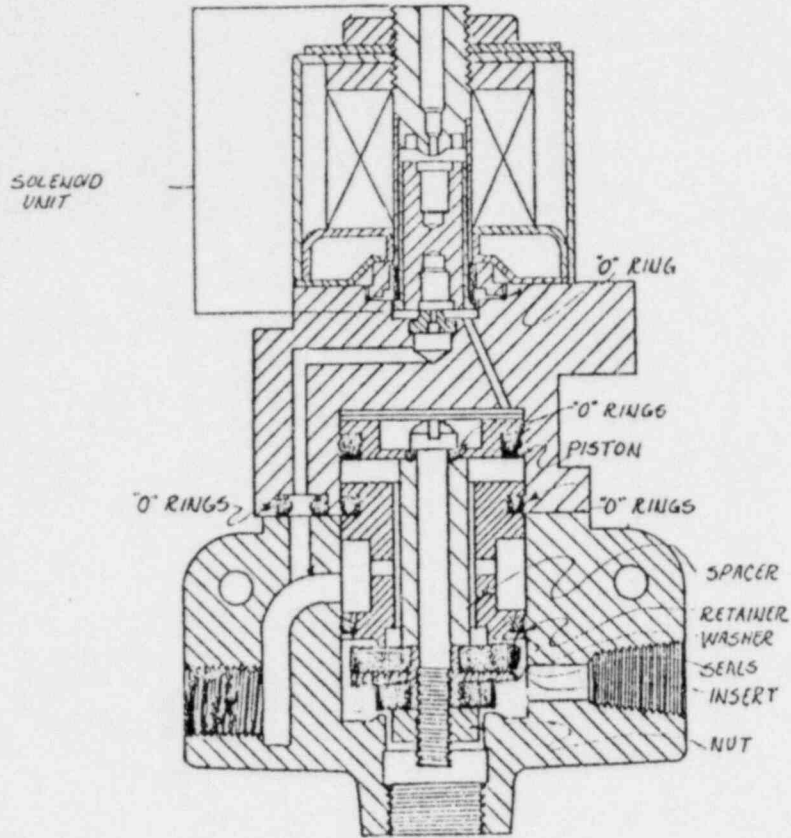
While the failure of valve 507B to shut constitutes a violation of Technical Specification 3.9.a requiring the primary isolation valves to be operable in Mode I or II, it does not constitute a failure of the safety system. The proper operation of the isolation valves is not required for the protection of fuel element integrity as described in the bases to the Technical Specifications, section 3.9. The primary protection from the loss of core water lies with the check valve located on the reactor side of valve 507B, the invert loop, and the syphon break system.

#### Corrective Action

An immediate inspection was conducted on all Schrader Type 972S valves used in the system. Valves with the older type seal were found on the pressurizer isolation valve (valve 527C) and the nitrogen charging isolation valve to the pressurizer (valve 526). Both of these valves operated satisfactorily. An inspection of the Schrader Type 972S valves held in the supply system was also completed. Scovill has since assigned new part numbers to the Type 972S used by us to prevent the reoccurrence of this incident. This change is described in a letter from Scovill Schrader Bellows Division to the University of Missouri dated August 21, 1980 (Enclosure 4). The reactor supply system has been changed to reflect Scovill's action; additionally all new seal kits and valves will be inspected on receipt to verify they are the proper type.

MODIFIED Schrader Type 972S

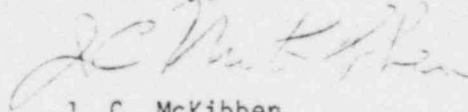
Note: smaller size of the lower seal.



TITLE	
529 SERIES 3-WAY SOLENOID VALVE	
RESEARCH REACTOR FACILITY UNIVERSITY OF MISSOURI	
DRAWN BY <i>Vicki Sweetgrass</i>	APPROVED <i>ACR</i>
SHEET NO. <u>1</u> OF <u>1</u>	DWG. NO. <u>959</u>

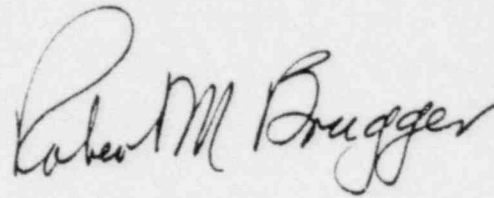
Director of Licensing  
August 29, 1980  
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Sincerely,



J. C. McKibben  
Reactor Manager

Endorsement  
Reviewed and approved:



Robert M. Brugger  
Director

JCMK:vs

Enclosures: (4)

cc: James Keppler, Director  
Regulatory Operations - Region III  
Reactor Advisory Committee  
Reactor Safety Subcommittee  
Document Management Branch, NRC