

July 21, 2000

Mr. Samuel N. Shields
Vice President - Engineering
Atwood and Morrill Company, Incorporated
285 Canal Street
Salem, Massachusetts 01970

SUBJECT: REQUEST FOR A TECHNICAL REVIEW OF A DRAFT MORNING REPORT
REGARDING ATWOOD & MORRILL MAIN STEAM ISOLATION VALVES

Mr. Shields:

The U.S. Nuclear Regulatory Commission (NRC) intends to issue a morning report discussing a problem reported by the licensee for Limerick Generating Station (Docket # 05000352) regarding the floating pilot poppet on Atwood & Morrill main steam isolation valves. We ask that you review the enclosed draft of that morning report to ensure the technical information is accurate. Your cooperation in this matter is appreciated. Please return any comments you may have as soon as possible. A copy of this request and your response will be placed in the Public Document Room for review by the public. Your response should be mailed to:

U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: David Skeen, NRR/REXB
MAIL STOP: O12D3

Please address any questions you may have on this matter to David Skeen of my staff. Mr. Skeen may be reached by phone at (301) 415-1174 or E-mail at: dls@nrc.gov. If no comments are received by close of business August 4, 2000, we will assume the technical information in the report is correct.

/RA/

Ledyard B. Marsh, Chief
Events Assessment, Generic Communications
and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Enclosure: Draft Morning Report

July 21, 2000

Mr. Samuel N. Shields
Vice President - Engineering
Atwood and Morrill Company, Incorporated
285 Canal Street
Salem, Massachusetts 01970

SUBJECT: REQUEST FOR A TECHNICAL REVIEW OF A DRAFT MORNING REPORT
REGARDING ATWOOD & MORRILL MAIN STEAM ISOLATION VALVES

Mr. Shields:

The U.S. Nuclear Regulatory Commission (NRC) intends to issue a morning report discussing a problem reported by the licensee for Limerick Generating Station (Docket # 05000352) regarding the floating pilot poppet on Atwood & Morrill main steam isolation valves. We ask that you review the enclosed draft of that morning report to ensure the technical information is accurate. Your cooperation in this matter is appreciated. Please return any comments you may have as soon as possible. A copy of this request and your response will be placed in the Public Document Room for review by the public. Your response should be mailed to:

U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: David Skeen, NRR/REXB
MAIL STOP: O12D3

Please address any questions you may have on this matter to David Skeen of my staff. Mr. Skeen may be reached by phone at (301) 415-1174 or E-mail at: dls@nrc.gov. If no comments are received by close of business August 4, 2000, we will assume the technical information in the report is correct.

/RA/

Ledyard B. Marsh, Chief
Events Assessment, Generic Communications
and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Enclosure: Draft Morning Report

DISTRIBUTION

DBMatthews DRIP R/F LBMarsh REXB R/F DLSkeen Central Files
PUBLIC

Accession No.: ML003732668

Template No.: NRR 056

To receive a copy of this document, indicate in the box C=Copy w/o attachment/enclosure E=Copy with attachment/enclosure N = No copy

OFFICE	REXB:DRIP		C:REXB:DRIP	
NAME	Originator/DLS	LMarsh/JLyons		
DATE	07/18/00	07/21/00		

OFFICIAL RECORD COPY

CITF

Licensee/Facility:

PECO Energy Company
Limerick 1
Philadelphia, PA

Atwood and Morrill Company, Inc.
285 Canal Street
Salem, MA 01970

Notification:

MR Number: H-00-xxxx
Date: 07/xx/00

Subject: MODIFICATIONS TO ATWOOD & MORRILL MSIVs USED IN BWRs

Discussion:

On April 4, 2000, a potential design problem with a floating pilot poppet on an Atwood & Morrill (A&M) main steam isolation valve (MSIV) at Limerick 1 was discussed on the R-I/NRR morning conference call. The Limerick licensee had contacted A&M after an inboard MSIV failed a local leak rate test and subsequent licensee investigation discovered the pilot poppet had separated from the stem. The floating pilot poppet was a design modification made by A&M to allow the pilot end of the stem to have a small amount of movement to compensate for a loss of clearance due to wear over a period of time.

The floating pilot poppet design includes a pilot poppet that is an internally threaded, cup-shaped forging with a hard surfaced seat and wear surfaces on its diameter. The poppet is held onto the stem with a split ring and pilot poppet nut. The end of the stem is machined to accept the split ring and fits inside the pilot poppet. The poppet nut is slid over the stem and then the split ring is installed in the groove of the stem. The pilot poppet is then installed on the stem with the split ring fitting inside it below the internal threads. The poppet nut is then slid down the stem and screwed into the pilot poppet. As the nut tightens it draws the pilot poppet up until the pilot poppet, split ring, and nut are locked together. A set screw is installed through the side of the nut and tightened against the pilot poppet threads to act as a secondary locking device. The set screw was ineffective in the failed MSIV at Limerick, allowing the poppet nut and pilot poppet to become unthreaded to the point that they separated.

The Limerick licensee stated that A&M noted that River Bend had a similar failure of a pilot poppet in an MSIV in April 1999. Because of the potential generic implications of the two similar failures, NRR staff contacted the A&M Vice President (VP) of Engineering to discuss the failures.

During a conference call between NRR staff and A&M on May 5, 2000, the VP-Engineering confirmed that River Bend had experienced a similar failure of the pilot poppets on two MSIVs in April 1999. As a result, A&M sent a letter to the River Bend licensee providing a solution to the problem on July 30, 1999. The letter included a sketch showing where to add a weld to attach the pilot poppet nut to the pilot poppet. The weld provides a more positive means for locking the nut in place. A&M sent a copy of the letter to all of its potentially affected customers, including the Limerick licensee in July 1999. The Limerick licensee was aware of the letter prior to the MSIV failure and the engineering department had determined that the weld should be implemented once the Limerick MSIVs began experiencing the pilot poppet failures. The Limerick licensee will now implement the weld modification on its MSIVs.

While discussing the floating pilot poppet modification with A&M, the NRR staff learned that several enhancements and modifications have been made by A&M over the last ten years to address ongoing functional and leakage issues associated with MSIVs in BWRs. Most BWR licensees have incorporated the modifications. In addition to the floating pilot poppet, the key modifications are:

Nose Guided Poppet - the nose of the poppet was redesigned to have a cone-shaped leading edge to help guide the poppet into the valve body seat,

Anti-Rotation Stem and Poppet - locks the poppet to the stem, and the stem to the external bottom spring plate, to prevent rotation of the poppet or stem, which could cause wear on the valve body rib while the valve is in the open position (see Information Notice 94-08, "Potential for Surveillance Testing to Fail to Detect an Inoperable Main Steam Isolation Valve," Accession #9401260242),

Improved Stem Guidance System - helps eliminate stem breakage due to side loading and provides increased stem guidance,

Poppet Backseated Cover - locks the poppet to the valve cover while the valve is in the open position, thus eliminating rib wear caused by poppet movement while the valve is open.

The failure of the pilot poppet is not seen as a significant safety concern. If the pilot poppet separates from the stem, it is captured in the assembly and will not prevent the MSIV from closing. However, the MSIV could experience leakage in excess of TS limits. Welding the nut to the pilot poppet will prevent the poppet from separating from the stem.

Contacts:	Art Burritt, R-I	610-327-1344
	Dave Skeen, NRR	301-415-1174
	Kamal Naidu, NRR	301-415-2980