NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
McGuire Nuclear Station - Unit 1	0 5 0 0 0 3 6 9	1 OF 0 8

TITLE (4) A HANGER CLAMP INSTALLED ON CONTAINMENT ISOLATION VALVE IN AN UNACCEPTABLE LOCATION DUE TO APPARENT PERSONNEL ERROR

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 1	1 1	8 8	8 8	— 0 0 2	— 0 0	0 2	1 5	8 8		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 9 6	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	XXX 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
STEVEN E. LeROY - LICENSING	AREA CODE 7 0 4 3 7 3 - 6 2 3 3

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	XX NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On 01/11/88, Duke Design Engineering (DE) determined that the location of a clamp attaching a hanger to valve 1NM-217B, Steam Generator D Upper Shell Sample Containment Inside Isolation, was unacceptable because the clamp could potentially damage the valve operator in a seismic event. DE contacted the manufacturer of the valve operator who confirmed the location of the clamp to be unsatisfactory on 01/11/88. DE then contacted Operations who declared valve 1NM-217B inoperable at 1050. The valve was deenergized in the safety (closed) position at 1155 to comply with Tech Specs. This event was due to Personnel Error because the location of the clamp attaching the hanger to valve 1NM-217B was apparently changed without appropriate approval or documentation between the original hanger installation in December 1980, and August 1983. The Hanger Removal and Replacement procedure will be revised to require use of applicable drawings to verify proper hanger installation. A modification will be initiated to reposition the clamp after DE determined the appropriate clamp location. Design drawings of valves with Rotork operators will be reviewed to identify those with hangers attached to valve operator extensions. Also, during snubber inspections, McGuire will physically inspect for valve operator extensions with hangers of snubbers attached.

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INTRODUCTION:

On January 11, 1988, Design Engineering (DE) determined that the location of a clamp attaching hanger 1-MCR-NM-651 to valve 1NM-217B, Steam Generator D Upper Shell Sample Containment Inside Isolation [EIIS:ISV], was unacceptable because the clamp could potentially damage the valve operator [EIIS:84] in a seismic event. The location was first suspected to be unsatisfactory on January 7, 1988 when DE personnel were reviewing a Variation Notice (VN) containing a proposed revision to hanger [EIIS:H] drawings. DE contacted the manufacturer of the valve operator who confirmed the location of the clamp to be unsatisfactory by January 11, 1988. DE then contacted McGuire Operations who declared valve 1NM-217B inoperable at 1050. The valve was deenergized in the safety (closed) position at 1155 to comply with Technical Specification 3.6.3.

Unit 1 was in Mode 1, Power Operation, at 96% power level when the determination was made that the hanger clamp location was unacceptable.

This event has been assigned a cause of Personnel Error because the location of the clamp attaching hanger 1MCR-NM-651 to valve 1NM-217B was apparently changed without appropriate approval or documentation between the original hanger installation in December 1980, and August 1983.

EVALUATION:

Background

Valve 1NM-217B is a 1 inch Kerotest valve (model number DP-D-991SMO-2) with a Rotork motor operator (model number 11NA1). The valve is a normally closed containment isolation valve which provides sample flow from the secondary side of D Steam Generator [EIIS:SG].

Technical Specification (TS) 3.6.3 requires specified containment isolation valves, including valve 1NM-217B, to be operable in Modes 1 (Power Operation) 2 (Startup), 3 (Hot Standby), and 4 (Hot Shutdown) or one of four conditions in the action statement must be met. One of these conditions is that the affected penetration be isolated within four hours by a minimum of one deactivated automatic valve [EIIS:ISV] secured in the safety position.

Nuclear Safety Related piping at McGuire Nuclear Station is designed to survive a seismic event as described in the McGuire Final Safety Analysis Report. The piping is equipped with snubbers [EIIS:SNB] to control movement under dynamic conditions. Since the support design and analysis assumes the existence of these snubbers, TS 3.7.8 requires that all snubbers be operable when the system they are a part of is required to be operable. Two hangers with snubbers, 1MCR-NM-651 and 1MCR-NM-652, are each bolted to valve 1NM-217B with a 4 and 9/16 inch outside diameter pipe [EIIS:PSP] clamp.

According to long standing general guidelines from Rotork on the attachment of hangers to valve operators, a hanger should only be clamped close to the base of the operator (where the operator attaches to the valve) or to the gearbox casing. In most cases, it is preferable to attach a hanger to the valve body.

When MNT removes, repairs, or reinstalls hangers on Unit 1, they use the Record Copy of the hanger drawing. A Record Copy contains notes and approved changes from on-site Design Engineers at the time of original installation and has a Hanger Discrepancy sheet attached with notes from Quality Control (QC) personnel who inspected the hanger after original installation. The Record Copy is the most accurate record of hanger orientation, measurements, and specifications, but it is sometimes difficult to read because of photocopied handwritten and handdrawn revisions made by Design Engineers during original installation.

Description of Event

In December of 1980, hanger 1MCR-NM-651 was secured to valve 1NM-217B and checked by on-site DE personnel. On December 17, 1980, Construction QC personnel noted the resolution of several discrepancies related to the hanger on the Hanger Discrepancy Record. Three of these discrepancies, in conjunction with notes made on December 15, 1980 on the record copies of the drawings for hanger 1MCR-NM-651, indicate some controversy over the positioning of the clamp designed to secure hanger 1MCR-NM-651 to valve 1NM-217B.

After the installation of the hanger in 1980, but prior to initial criticality of Unit 1 on August 8, 1981, Health Physics personnel photographed valve 1NM-217B (as part of an ALARA program) which showed the clamp for hanger 1MCR-NM-651 around the body of valve 1NM-217B (see Page 8 of 8). The position of the clamp on the valve in this photograph corresponds to the position of the clamp on the valve on the hanger drawings.

On August 15, 1983, Mechanical Maintenance (MNT) removed hanger 1MCR-NM-651 for Instrumentation and Electrical (IAE) to check the torque settings on valve 1NM-217B under Work Request 114984. The hanger was reinstalled by MNT on August 17, 1983 and was subsequently inspected by QC for drawing of photograph. Both a MNT and QC representative signed off that "the hanger is installed in accordance with the Design sketch" in on the Hanger Removal and Replacement procedure.

On November 29, 1984, MNT removed hanger 1MCR-NM-651 from valve 1NM-217B for work on the limit switches and computer points under Work Request 85566. IAE noted on the work request that the hanger had to be disconnected from the Add-On-Pack, which is the name used for the switch housing on some Rotork valves. Record Copy drawings of hanger 1MCR-NM-651 used with this work request showed the position of the clamp to be on the valve body, which was unchanged from original installation. MNT reinstalled the hanger and QC inspected it on December 7, 1984. Both a MNT and QC representative signed off that "the hanger is reinstalled in accordance with the Design sketch" on the Hanger Removal and Replacement procedure.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

On November 22, 1986, MNT removed hanger 1MCR-NM-651 from the switch housing of valve 1NM-217B, as specified on Work Request 66950, to assist IAE in an inspection of the valve operator, as specified by Work Request 66800. On November 23, 1986, MNT reinstalled the hanger but the cold piston setting, a reference length of the snubber when cold, was not within acceptance criteria. A MNT and QC representative signed that "the hanger is installed in accordance with the Design sketch" on the Hanger Removal and Replacement procedure. An operability statement was obtained for valve 1NM-217B from DE and a Nonconforming Item Report was initiated to resolve the problem with the unacceptable cold piston setting. The two recommended resolutions were to verify that the piping was installed according to applicable Design drawings within the allowed tolerances and to modify the hanger as required to achieve the required cold piston setting.

There is no documentation to support that anyone actually verified that the piping was installed according to Design drawings, and none of the involved interviewed performed a review. MNT initiated Work Request 59765 to lengthen a piece of tube steel on the hanger to achieve the proper cold piston setting. (MNT felt that the reason for the failed cold piston setting in 1986 was the excessive flexibility of the entire pipe on which valve 1NM-217B was attached.) After MNT completed the modification specified on this work request on October 16, 1987, a QC inspector noticed that the clamp for hanger 1MCR-NM-651 was attached to the valve operator switch housing while the clamp was shown on the Record Copy drawing as attached to the valve body. MNT Technical Support and Projects were consulted about the discrepancy. On October 17, 1987, Projects initiated Variation Notice (VN) 1053 to change the clamp location on the drawing to correspond to the actual clamp location on the valve operator. DE Civil approved the change to the drawings on October 23, 1987 on VN 1061, which superseded VN 1053.

On January 7, 1988, the DE Valve Group received VN 1061 to formally approve the proposed revision to drawings of hanger 1MCR-NM-651. A DE person, who was familiar with the general Rotork guidelines concerning hanger placement, was uncertain that a clamp attaching a hanger to the valve operator would be acceptable in a seismic event. He consulted with Rotork representatives who confirmed on the morning of January 11, 1988 that a hanger should not be attached to the valve operator on the motor housing or switch housing. The Rotork representatives reconfirmed recommendations previously furnished to Duke Power Company that a hanger should be attached at the base of the motor operator (where it attaches to the valve), on the gear box, or on the valve. Rotork representatives conceded that the extensions, the motor housing and switch housing, would withstand some load but that the amount of load is unknown because no analysis has been performed.

The DE Valve Group notified McGuire Operations and Compliance and DE Civil of the problem with the hanger clamp location. Operations declared valve 1NM-217B inoperable at 1050 on January 11, 1988. Operations then deenergized valve 1NM-217B in the safety (closed) position and declared the valve operable at 1155. Valve 1NM-217B remains deenergized and closed under a Removal and Restoration order, which documents components out of normal position and requires

documentation for repositioning, until the hanger clamp location can be resolved during an outage. (Valve 1NM-217B is inaccessible during power operation.)

Conclusion

This event has been assigned a cause of Personnel Error because the location of the clamp attaching hanger 1MCR-NM-651 to valve 1NM-217B was apparently changed without appropriate approval or documentation between the original hanger installation in December 1980 and August 1983. No record of any activity during this time period on valve 1NM-217B or hanger 1MCR-NM-651 was discovered during this investigation; therefore, the person(s) involved could not be identified.

The hanger clamp was located correctly according to Design drawings when Health Physics personnel photographed the valve prior to Unit 1 Startup on August 8, 1981. Although not conclusive, Work Request 114984 indicates that the clamp was located on the switch housing in August 1983 because the hanger had to be disconnected to work on limit and torque switches which are located in the switch housing. In November 1984, the clamp was definitely located on the switch housing according to documentation on Work Request 85566.

On four separate work requests probably performed after the clamp was initially placed on the valve operator switch [EIIS:ASU] housing, MNT apparently reinstalled the clamp on the switch housing after removal for maintenance and signed that "the hanger is installed in accordance with the Design sketch" on the maintenance procedure, Hanger Removal and Replacement. On the first three of these work requests, a QC inspector also signed off this step. The Design sketch referred to in this procedure is the Record Copy of the hanger drawing which showed the hanger clamp attached to the valve body, not the valve operator. A mitigating factor in this repeated error may have been that the Record Copy of hanger drawing 1MCR-NM-651, page 2 of 3, shows two elevations written beside the clamp, one corresponding to the valve body and one to the valve operator; however, both elevations were crossed out on the Record Copy. The deletion of the elevation notes appears to have been done to resolve one of the Construction QC inspector's discrepancies noted on the Hanger Discrepancy Record. It is possible that the elevation notes on the Record Copy drawings, which are used as the Design sketches by MNT during hanger installation, confused MNT and QC. The Record Copy showed the hanger clamp to be around the valve body, which is differentiated from the valve operator on the drawing, but the drawing of the valve is not very detailed.

Another possibility is that MNT simply match marked the place from which the clamp was removed and replaced the clamp where the marks were made. On Work Request 59765 performed in October 1987, MNT personnel involved do not believe that the hanger clamp was disconnected from the valve. They believe they disconnected the other end of the hanger for the required work.

MNT personnel assigned to hanger removal and replacement are currently trained under the Employee Training and Qualification System to ensure that the locations of hangers in the field correspond to that shown on the Record Copy drawing. This

training program was not in place at the time the original error in clamp location was apparently made. QC personnel are trained to perform inspections in accordance with the Quality Assurance-Quality Control Procedures Manual and applicable MNT procedures.

A review of the McGuire Licensee Event Reports (LERs) revealed that LERs 370/87-01 and 370/87-08 were submitted concerning inoperable snubbers. These two events were not attributed to personnel error; therefore, this event is not considered to be recurring.

This event is not reportable to the Nuclear Plant Reliability Data System (NPRDS).

CORRECTIVE ACTIONS:

Immediate: Valve 1NM-217B was deenergized in the safety (closed) position within 4 hours after the valve was declared inoperable.

Subsequent: None

Planned:

1) MNT will revise procedure MP/0/A/7650/44, Hanger Removal and Replacement, to require using applicable McGuire Support Restraint Drawings, in addition to Record Copy hanger drawings, to verify proper hanger installation.

2) Projects will initiate a Nuclear Station Modification to reposition the clamp for hanger 1MCR-NM-651 after DE Civil determine an appropriate clamp location.

3) MNT will review Design drawings of valves with Rotork valve operators which have hangers (as listed in the IAE data base) to identify any with hangers attached to valve operator extensions. A list of any valves identified will be provided to the DE Valve Group which will evaluate the positioning of the hangers.

4) During the routine snubber inspections performed to comply with TS 3.7.8, MNT will inspect for snubbers and hangers attached to valve operator extensions and provide a list to the DE Valve Group for evaluation.

SAFETY ANALYSIS:

Hanger 1MCR-NM-651 is designed to restrain Nuclear Sampling (NM) system piping during seismic events as described in the McGuire Final Safety Analysis Report. During normal plant operations, the incorrect location of the hanger clamp on valve 1NM-217B would have no consequences. From original installation of the hanger clamp in December 1980 to January 11, 1988, the station was not subjected to any seismic events.

If a seismic event had occurred during this time frame, the valve operator could have withstood some load without sustaining any damage; however, the representatives of Rotork, the manufacturer of the motor operator, have stated that the amount of load the operator could withstand without damage is unknown. The worst potential consequence of the clamp being located on the motor operator would be deformation of the valve operator, possibly preventing the valve from closing on a containment isolation signal. (Valve 1NM-217B is a normally closed valve and has an open/closed indicator in the control room.) It should be noted that, although valve 1NM-217B is a containment isolation valve, an intact Steam Generator is a barrier between the valve and either the Reactor Coolant system [EIIS:AB] or the containment atmosphere.

Valve 1NM-221A, Steam Generator D Sample Containment Outside Isolation [EIIS:ISV], was available to isolate the penetration on a containment isolation signal the majority of the time that the hanger clamp was less than ideally located on valve 1NM-217B. Manual valve 1NM-222, Steam Generator Blowdown Sample Heat Exchanger 1D Isolation [EIIS:ISV], is located downstream of valve 1NM-221A and would be capable of isolation if necessary.

There were no personnel injuries, personnel overexposures, or releases of radioactive material as a result of this event.

This event is considered to be of no significance with respect to the health and safety of the public.

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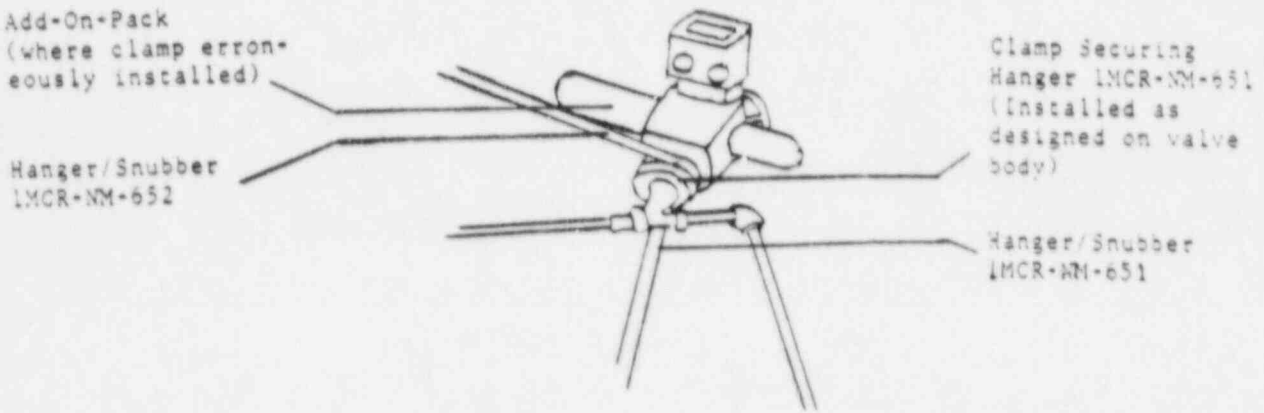
TEXT (If more space is required, use additional NRC Form 366A's) (17)

Drawing of Photograph
Of Valve
1NM-217B Hanger 1MCR-NM-651



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HAL B. TUCKER
VICE PRESIDENT
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February 15, 1988

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: McGuire Nuclear Station, Unit 1
Docket No. 50-369
Licensee Event Report 369/88-02

Gentlemen:

Pursuant to 10CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 369/88-02 concerning a hanger clamp being installed on a containment isolation valve in an unacceptable location. This report is being submitted in accordance with 10CFR 50.73(a)(2)(i)(B). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

SEL/228/jgc

Attachment

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