

Part 21 (PAR)

Event # 52857

Rep Org: CRANE NUCLEAR, INC.	Notification Date / Time: 07/13/2017 17:59 (EDT)
Supplier: CRANE NUCLEAR, INC.	Event Date / Time: 06/05/2017 (CDT)
	Last Modification: 07/13/2017
Region: 3	Docket #:
City: BOLINGBROOK	Agreement State: Yes
County:	License #:
State: IL	
NRC Notified by: SAMSON KAY	Notifications: ANTHONY DIMITRIADIS R1DO
HQ Ops Officer: DONG HWA PARK	BRIAN BONSER R2DO
Emergency Class: NON EMERGENCY	PART 21/50.55 REACTORS EMAIL
10 CFR Section: 21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE	

PART 21 - DEFECTIVE SAFETY RELATED VALVES

The following was excerpted from a letter by Crane Nuclear, Inc.:

"The plug valve designs provided for XOMOX model figure numbers 037AX, 067EG, and 037. These valves have been identified as used in nuclear and/or safety related applications.

"The stem for the Subject valve models was identified as being undersized based on allowable yield stress analysis of the stem while in torsion. The high stress condition was due to the high torque required to seat/unseat the plug when installed with a Ultra High Molecular Weight Polyethylene (UHMWPE) sleeve material. High friction factor inherent with this material causes torsional stress to exceed the upper limit of yield strength of the valve which could result in fatigue/yielding of the stem, thus preventing the valve from opening and closing while in service. Historical research performed thus far has not identified any notifications from the customer(s) regarding stem failure of the subject valves, indicating that the valves may still be in operation with no performance related or operating issues.

"The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

"Notifications letters have been sent to the affected plants advising them of the condition, and recommending that the sleeve material be replaced with a lower friction Polytetrafluomethylene (PTFE) material that would significantly reduce the required input operating torque, thereby reducing the risk of failure of the stem material.

"XOMOX has been advised to modify design calculations to provide a larger margin for allowable yield strength of the stem material to ensure the stem is properly sized when Ultra High Molecular Weight Polyethylene (UHMWPE)

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sleeve material is used.

"Crane will continue to review XOMOX records to determine if any other sites are impacted, which we expect to complete by August 31, 2017.

"Should you have any questions regarding this matter, please contact Samson Kay, Manager of Engineering at (630) 226-4983 or Jennifer Bregovy, Manager of Quality and Safety at (630) 226-4949."

The following facilities received these safety related orders: TVA Sequoyah, Pennsylvania Power & Light Susquehanna.



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CRANE NUCLEAR, INC. 860 REMINGTON BOULEVARD BOLINGBROOK, IL. 60440

Date: July 13, 2017

**Attn: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-001**

**Subject: 10 CFR Part 21 Investigation Report
Notification of XOMOX Plug Valve High Torsional Stress in Stem**

Dear Sir or Madam:

This letter provides notification of Crane Nuclear's investigation into XOMOX plug valves (model figure numbers 037AX, 067EG, and 037), that were provided on nuclear and safety related applications.

(i) Name and address of the individual or individuals informing the Commission.

Samson Kay
Manager of Sustaining Engineering

Jennifer Bregovy
Manager of Safety and Quality

Crane Nuclear, Inc.
860 Remington Blvd
Bolingbrook, IL 60440

(ii) Identification of the basic component supplied for such facility or such activity within the United States which may fail to comply or contains a potential defect

The plug valve designs provided for XOMOX model figure numbers 037AX, 067EG, and 037. These valves have been identified as used in nuclear and/or safety related applications.

(iii) Identification of the firm supplying the basic component which fails to comply or contains a defect.

The valves subject to this notice were supplied by Xomox Corporation (Xomox) prior to 2001. In 2001, Xomox was acquired by Crane Co., which is also the parent company of CNI. At that time CNI, the entity which is providing this notice to the Commission, began providing support for the subject valves.

(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

The stem for the Subject valve models was identified as being undersized based on allowable yield stress analysis of the stem while in torsion. The high stress condition was due to the high torque



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required to seat/unseat the plug when installed with a Ultra High Molecular Weight Polyethylene (UHMWPE) sleeve material. High friction factor inherent with this material causes torsional stress to exceed the upper limit of yield strength of the valve which could result in fatigue/yielding of the stem, thus preventing the valve from opening and closing while in service.

Historical research performed thus far has not identified any notifications from the customer(s) regarding stem failure of the subject valves, indicating that the valves may still be in operation with no performance related or operating issues.

(v) The date on which the information of such defect or failure to comply was obtained.

Date of Discovery of Defect: 6/5/2017-6/9/2017

(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.

Historical research of the XOMOX records is still in process at this time. However, we have currently identified seven (7) sites that have previously ordered these valves.

Xomox / Tuffline Order No.	Customer Order No.	Customer	Valve Tag #	Order date or Assy dwg. date	Size, Pressure Class, Fig. #, Code Class
E-64021	73121	DeLaval	76001-135	11/15/1977	3" 150 psi Fig. 037A, Code Class 3
E-64021	73121	DeLaval	76001-134	11/11/1977	4" 150 psi Fig. 067EG, Code Class 3
	25336	Transamerica De Laval, Engine and Compressor div., Oakland, CA	76001-129	3/21/1989	6" 150 psi Fig. 037AX Tandem, Code Class 3
N2943 Item 2 & 2A	144954	Vokes Limited, Henley Park, Suffolk, England. Sizewell "B" Nuclear Power Station,	None	Oct. 31, 1990	6" 150 psi Fig. 037 Tandem, Code Class 3
QN3255	90N-LA-74720B	TVA Sequoyah	47W450-1003A, 47W450-1003C ((6) YE0418-FD-4), (6) YE5418-FD-2, (6) YE6418-FD-4)	9/7/1990	4" 150 psi fig, 067
NZX3271	7-20655-1	Pennsylvania Power & Light, Susquehanna	HBC-PL (Customer Item #'s 6.5 & 6.6)	10/10/1990	4" 150 psi fig, 067
NZX3676	P-93NLL-33390C-000	TVA Chattanooga	(6) YE0418-FD-4), (6) YE5418-FD-2, (6) YE6418-FD-4	6/4/1999	4" 150 psi fig, 067, Safety Related 10CFR21 Applies per TVA PO pg 1.



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(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

Notifications letters have been sent to the affected plants advising them of the condition, and recommending that the sleeve material be replaced with a lower friction Polytetrafluoroethylene (PTFE) material that would significantly reduce the required input operating torque, thereby reducing the risk of failure of the stem material.

XOMOX has been advised to modify design calculations to provide a larger margin for allowable yield strength of the stem material to ensure the stem is properly sized when Ultra High Molecular Weight Polyethylene (UHMWPE) sleeve material is used.

CNI will continue to review XOMOX records to determine if any other sites are impacted, which we expect to complete by August 31, 2017.

(viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

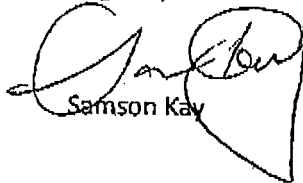
Not Applicable.

(ix) In the case of an early site permit, the entities to whom an early site permit was transferred.

Not applicable.

Should you have any questions regarding this matter, please contact Samson Kay, Manager of Engineering at (630) 226-4983 or Jennifer Bregovy, Manager of Quality and Safety at (630) 226-4949.

Regards,


Samson Kay

Post-it® Fax Note 7671		Date: 7/13	# of pages: 3
To: NRC OPERATION CTR	From: SAMSON KAY		
Co./Dept.	Co. CRANE NUCLEAR		
Phone #	Phone # 630-226-4983		
Fax # 301-816-5151	Fax #		