

LOOSE LOCKING NUT ON LIMITORQUE VALVE OPERATORS

Description of Circumstances:

On December 8, 1978, Fort Calhoun Station Unit No. 1 reported that 30 out of 65 Limitorque Type SMB valve operators did not have the locking nut fastened securely in accordance with the manufacturer's recommendation. If this locking nut is not secure it can loosen and allow the stem nut to move axially to the point that the splines are disengaged; resulting in a loss of drive to the valve stem. The licensee reported that several locking nuts were slightly loose but in no instance had the stem nut backed out enough to affect the operation of the valve. This licensee was made aware of the potential problem by a letter of July 28, 1978, from the NSSS supplier, Combustion Engineering, Inc.

Other plants have reported similar findings. On April 27, 1977, Davis-Besse Nuclear Power Station Unit No. 1, reported that two valve operability failures had been caused by locking nuts loosening and falling off. During the ensuing inspection program a total of 65 out of 144 safety related valve operators required staking. Arkansas Nuclear One (ANO), Unit 2, reported on June 29, 1978, that several valve operators required staking. A subsequent inspection at ANO Unit 2 was made by an IE inspector who identified records that 15 out of 17 SMB operators provided by the NSSS supplier (Combustion Engineering Inc.) required staking. Valve operability failures, resulting from loosened locking nuts, have also been reported by Cooper Nuclear Station (Unusual Event Report 75-5), Browns Ferry Unit 2 report of March 6, 1974 and Three Mile Island Nuclear Station Unit 1 reports of March 13, 1976 and October 20, 1976. The corrective action by the licensee in each case was to stake the locking nut.

In June 1978, the Limitorque Corporation issued a supplement to the October 1977 issue of the Type SMB Instruction and Maintenance Manual SMBI-170 that called for the crimping or staking of the locking nuts. The 1971 issue of the manual had statements for crimping and staking of the lock nuts incorporated into the manual. The stem nut specification drawing provided by Limitorque for Unit Types SMB-000, SMB-00, SMB-0, SMB-1, SMB-2, SMB-3, and SMB-4 directs the customer to a Limitorque Drawing No. 21-497-0009-3 for instructions on staking the locking nut; the specification drawing for the SMB-5 unit has a reference to Limitorque Drawing No. 21-497-0010-3 for staking instructions.

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Pennsylvania Power and Light Company (PP&L) informed the NRC that the generic problem of failure to stake locking nuts exists with Limitorque Type SMC valve operators and Type SMB operators. PP&L Co. was advised of the problem by Bechtel Corporation. The information was submitted to the NRC on March 2, 1979 as a deficiency at the Susquehanna Steam Electric Station. The Type SMC Instruction and Maintenance Manual SMCI-04-78 and Drawing No. 21-497-0013-3 provide directions for securing the locking nut.

All holders of construction permits and operating licenses should be aware that the potential for valve operator failure exists if the locking nut is not adequately secured. The recommended action is to survey all installed Limitorque Operator Types SMB-000 through SMB-5 and Type SMC to determine that the locking nut is secure and to verify that assembly and maintenance instructions contain directions for securing the locking nut either by staking, per the vendor's recommendation, or another acceptable manner.

No written response to this Circular is required. If you require additional information regarding this subject, contact the Director of the appropriate NRC Regional Office.

LISTING OF IE CIRCULARS ISSUED IN
LAST TWELVE MONTHS

Circular No.	Subject	Date of Issue	Issued To
78-16	Limiter Valve Actuators	7/26/78	All Holders of Reactor OLs or CPs
78-17	Inadequate Guard Training/Qualification and Falsified Training Records	10/13/78	All Holders of and applicants for Reactor OLs.
78-18	UL Fire Test	11/6/78	All Holders of Reactor OLs or CPs
78-19	Manual Override (Bypass) of Safety Actuation Signals	12/28/78	All Holders of CPs
79-01	Administration of Unauthorized Byproduct Material to Humans	1/12/79	All Medical Licensees except Teletherapy Medical Licensees and each Radiopharmaceutical Suppliers
79-02	Failure of 120 Volt Vital AC Power Supplies	2/16/79	All Holders of Reactor OLs and CPs
79-03	Inadequate Guard Training-Qualification and Falsified Training Records	2/23/79	All Holders of and applicants for Special Nuclear Material Licenses in Safeguards Group I
79-04	Loose Locking Nut on Limiter Valve Operators	3/16/79	All Holders of Reactor OLs or CPs