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SUBJECT: Part 21 rept re potential defect in component of KSV emergency diesel generator sys.Redesign stud w/smaller drilled & reamed hole.

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COOPER
Cooper Energy Services

June 2, 1994

Our Ref: QCG-9863

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

Dear Sir:

In accordance with the requirements of the Nuclear Regulatory Commission Title 10, Chapter 1, Code of Federal Regulations, Part 21, Cooper-Bessemer Reciprocating Products Division, a division of Cooper Industries, hereby notifies the Commission of a potential defect in a component of the KSV emergency diesel generator system.

There exists a potential problem with the fuel pump mounting stud, Cooper Bessemer part number KSV-18-1B#1. Four studs are used to mount the fuel pump for each cylinder on the engine. These studs were supplied to the following utilities:

UTILITY	QTY.	SERIAL NO.	CUST. P.O. NO.
Houston Light & Power	300	1F38	QS0003479
Pennsylvania Power & Light	20	2J2001 thru 2J2015 2D3001 thru 2D3005	1-20419-1, Rev. 5

Between 1987 and May of 1994, Houston Light and Power (HL&P) has experienced eleven failures of the fuel pump mounting stud, KSV-18-1B, which is the commercial equivalent of the safety related part. Two other utilities, Commonwealth Edison - Braidwood, and Pennsylvania Power and Light Co. - Susquehanna, have experienced one failure each of the commercial stud. No failures have been reported with the KSV-18-1B#1, the safety related fuel pump mounting stud.

Stress calculations have been carried out by Cooper Bessemer at various times since 1987, by MPR Associates for HL&P in April 1993, and by HL&P in April 1994. These calculations show that the stud has adequate strength for this application as long as they are manufactured and installed correctly, and the proper preload maintained. This conclusion is reinforced by the history of successful operation at other sites.

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Several of the failed studs were sectioned and wall thickness found to be from .029" to .035" versis the design tolerance of .036" - .054" (.045" nominal). In addition, ten sample pieces were removed from service and tested to failure. The results show total span of failure stress between 5.6 and 10.2 KIPS, versis the theoretical minimum of 8.3 KIPS. All studs which were tested and/or failed have been the KSV-18-1B, commercial part number.

Based on the analytical and physical evidence outlined above, we have concluded that the stud design is sensitive to both normal and expected manufacturing variations, and has a relatively small margin for abuse during installation and maintenance.

Corrective action at Cooper will be to redesign the stud with a smaller 3/8" drilled and reamed hole. This will provide a much more robust design, with a minimum theoretical strength of 11.9 KIP, while maintaining most of the "fuse" feature of the original. This action will be completed in June 1994.

Corrective action at the affected utilities should be to return all of the safety related studs, KSV-18-1B#1, and replace with the new part number KSV-18-1B#3.

Cooper's investigation into this matter was concluded on May 31, 1994. If you have any questions regarding this issue, please contact John R. Schneider, Quality

Assurance Manager or John M. Horne, Manager of Nuclear and Analytical Engineering at 412-458-8000.

Sincerely,

J. D. Mowery
Vice President and General Manager

Attachment

/rec

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