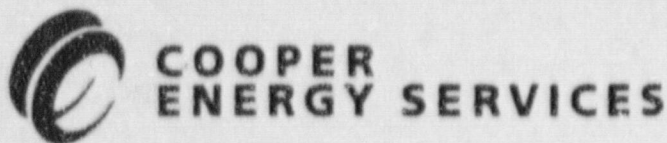


530

150 Lincoln Avenue  
Grove City, PA 16127-1898  
Tel 412 458 8000  
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December 12, 1997

Our Ref: QCG-10446 (K-5fa42)

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

Subject: 10 CFR 21 Notification, Enterprise DSR-4 and DSRV-4 Emergency Diesel Generator Adjusting Screw Failure

Dear Sir:

In accordance with the requirements of the Nuclear Regulatory Commission Title 10, Chapter 1, Code of Federal Regulations, Part 21, Cooper Energy Services (CES), a division of Cooper Cameron Corporation, hereby notifies the Commission of a potential manufacturing defect of the Enterprise® DSR-4 and DSRV-4 Emergency Diesel Generators (EDG's).

Discussion:

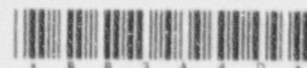
On September 26, 1997, Entergy Operations River Bend Station reported the failure of an adjusting screw, Cooper Energy Services part number 1A-7840. The adjusting screw is a ball and swivel assembly utilized to allow for angular movement between the rocker arm and intake and exhaust valve stems of the power cylinder head. The adjusting screw is assembled by swaging a "swivel pad" on to a "ball".

Subsequent investigation determined that the swaging process and tooling was of a design that allowed for "overswaging" of the pad, reducing the amount of free angular movement in the assembly. This condition potentially caused the material of the upper edge of the swivel pad to be over stressed, and/or limit the ability of the assembly to accommodate the required angular movement with undue stress.

The failure of the assembly was the cracking of the swivel pad material at the upper edge. This failure has the potential to cause an operability concern due to the assembly separating and excess clearance (valve lash) being established which could lead to catastrophic failure of the valve stem or remaining ball portion of the assembly. Multiple failures of the assembly without catastrophic failure could also reduce engine output due to decreased valve lift. In addition, loose pieces of the assembly could cause secondary damage in the engine.

IE 19/11

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PDR ADOCK 05000413  
S PDR



Cooper Energy Services has supplied the 1A-7840 adjusting screw to the following utilities and sites:

<u>AFFECTED UTILITIES</u>	<u>SITE</u>	<u>REMARKS</u>
Entergy Operations Duke Power Korea Electric	River Bend Catawba KORI 3 & 4	Replaced

#### CORRECTIVE ACTION

The subject assemblies at River Bend Station have been replaced with acceptable assemblies.

The swaging tooling has been corrected to limit the amount of "swage". Acceptance criteria assuring the necessary freedom of the assembly has been defined and will be verified during manufacture.

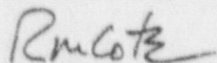
#### USER RECOMMENDATIONS

Utilities currently in possession of 1A-7840 assemblies are instructed to verify that a minimum of 18 degrees of angular movement from centerline is available in all directions, with no indication of roughness when moving.

If you have any questions concerning this report, please contact Andrew P. Steffan, Supervisor, Quality Engineering at 412-458-3455 or Ronald G. Billig, Supervisor Aftermarket Engineering at 412-458-3584.

Sincerely,

COOPER CAMERON CORPORATION



R. M. Cote  
Vice President and General Manager

:klf

cc: J. M. Home - CES/GC  
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A. P. Steffan - CES/GC  
S. R. Johnston - CES/Alameda  
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File: K5fa42

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Plant Manager, Yonggwang Nuclear Unit 1 \* 2  
**Korea Electric Power Corp.**  
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Yonggwang-Gun Jeon Nam  
Korea 513-880

## GENERAL INFORMATION or OTHER

EVENT NUMBER: 33398

LICENSEE: COOPER ENERGY SERVICES CITY: GROVE CITY REGION: 1 COUNTY: STATE: PA LICENSE#: AGREEMENT: N DOCKET:	NOTIFICATION DATE: 12/12/97 NOTIFICATION TIME: 15:30 [ET] EVENT DATE: 12/12/97 EVENT TIME: 15:30 [EST] LAST UPDATE DATE: 12/12/97
NRC NOTIFIED BY: ANDREW STEFFAN HQ OPS OFFICER: JOHN MacKINNON	NOTIFICATIONS PAUL FREDRICKSON RDO JOHN PELLET (REG 4) RDO VERN HODGE (RVIB) NRR
EMERGENCY CLASS: NOT APPLICABLE 10 CFR SECTION: CDEG 21.21(c)(3)(i) DEFECTS/NONCOMPLIANCE	

## EVENT TEXT

10 CFR 21 NOTIFICATION, ENTERPRISE DSR-4 AND DSRV-4 EMERGENCY DIESEL GENERATOR ADJUSTING SCREW FAILURE.

ON SEPTEMBER 26, 1997, ENTEKGY OPERATIONS RIVER BEND STATION REPORTED THE FAILURE OF AN ADJUSTING SCREW, COOPER ENERGY SERVICES PART NUMBER 1A-7840. THE ADJUSTING SCREW IS A BALL AND SWIVEL ASSEMBLY UTILIZED TO ALLOW FOR ANGULAR MOVEMENT BETWEEN THE ROCKER ARM AND INTAKE AND EXHAUST VALVE STEM OF THE POWER CYLINDER HEAD. THE ADJUSTING SCREW IS ASSEMBLED BY SWAGING A "SWIVEL PAD" ON TO A "BALL".

SUBSEQUENT INVESTIGATION DETERMINED THAT THE SWAGING PROCESS AND TOOLING WAS OF A DESIGN THAT ALLOWED FOR "OVERSWAGING" OF THE PAD, REDUCING THE AMOUNT OF FREE ANGULAR MOVEMENT IN THE ASSEMBLY. THIS CONDITION POTENTIALLY CAUSED THE MATERIAL OF THE UPPER EDGE OF THE SWIVEL PAD TO BE OVER STRESSED, AND/OR LIMIT THE ABILITY OF THE ASSEMBLY TO ACCOMMODATE THE REQUIRED ANGULAR MOVEMENT WITH UNDUE STRESS.

THE FAILURE OF THE ASSEMBLY WAS THE CRACKING OF THE SWIVEL PAD MATERIAL AT THE UPPER EDGE. THIS FAILURE HAS THE POTENTIAL TO CAUSE AN OPERABILITY CONCERN DUE TO THE ASSEMBLY SEPARATING AND EXCESS CLEARANCE (VALVE LASH) BEING ESTABLISHED WHICH COULD LEAD TO CATASTROPHIC FAILURE OF THE VALVE STEM OR REMAINING BALL PORTION OF THE ASSEMBLY. MULTIPLE FAILURES OF THE ASSEMBLY WITHOUT CATASTROPHIC FAILURE COULD ALSO REDUCE ENGINE OUTPUT DUE TO DECREASED VALVE LIFT. IN ADDITION, LOOSE PIECES OF THE ASSEMBLY COULD CAUSE SECONDARY DAMAGE IN THE ENGINE.

COOPER ENERGY SERVICES HAS SUPPLIED THE 1A-7840 ADJUSTING SCREW TO THE FOLLOWING SITES: RIVER BEND, CATAWBA, AND KORI 3 & 4 (KOREA ELECTRIC).

(Continued on next page)

CORRECTIVE ACTION:

THE SUBJECT ASSEMBLIES AT RIVER BEND STATION HAVE BEEN REPLACED WITH ACCEPTABLE ASSEMBLIES.

THE SWAGING TOOLING HAS BEEN CORRECTED TO LIMIT THE AMOUNT OF "SWAGE". ACCEPTANCE CRITERIA ASSURING THE NECESSARY FREEDOM OF THE ASSEMBLY HAS BEEN DEFINED AND WILL BE VERIFIED DURING MANUFACTURE.

USER RECOMMENDATIONS:

UTILITIES CURRENTLY IN POSSESSION OF 1A-7840 ASSEMBLIES ARE INSTRUCTED TO VERIFY THAT A MINIMUM OF 18 DEGREES OF ANGULAR MOVEMENT FROM CENTERLINE IS AVAILABLE IN ALL DIRECTIONS, WITH NO INDICATION OF ROUGHNESS WHEN MOVING.