

October 9, 1992
ELS92-04NRC.WP
MFN-189-92


Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Station 9 D4
Washington, D. C. 20555

Attention: G. C. Cwalina
Vendor Inspection Branch

Subject: Germane to Safety - Safety Related RHR Pump Motor Fan Failure at a BWR/4
Plant

Please find the attached memo of my telephone call to you of November 9, 1992. The call provided information about the subject failure.

Very truly yours,


R. C. Mitchell, Project Manager
Safety, Environmental & Quality Assurance

Attachment

cc: L. S. Gifford (GE-Rockville)
P. W. Marriott (GE)
(USNRC)
PRC File

Ar Encl

*See W. Haass
2222
1/1*

*Reg File-01 1 1
NRC PR 1 1
NRCs Abstract 1 1
W. Haass 1 1*

MEMO OF TELEPHONE CALL

DATE: November 9, 1992
TIME: 10:10 AM
PERSON CALLING: R. C. Mitchell
PERSON CALLED: G. C. Cwalina (NRC-NRR/RVIB, 301-504-2984)
SUBJECT: Safety Related RHR Pump Motor Fan Failure at a BWR/4 Plant

Greg Cwalina was called in order to inform the NRC of a condition determined to not be reportable but considered to be Germane-to-Safety. This conclusion is based upon GE completing its evaluation as to reportability under 10 CFR Part 21.

Background

BWR/4 utility recently informed GE-NE that a safety related GE pump motor for the Residual Heat Removal (RHR) system failed. During operation of the motor, a blade in the lower fan came loose and impacted the motor stator coils which caused an electrical fault. This motor was not original equipment. The utility had purchased this motor from a canceled nuclear project. In addition to this recent failure, in 1980, the same BWR/4 utility had experienced a similar fan failure on one of the plant's original RHR pump motors. At that time, it was concluded that the failure was due to fracturing of the single fillet welds which attach the fan blades to the fan discs. The utility subsequently fabricated a new fan for the failed motor and re-configured the current single fillet welds to include double fillet welds. In addition, to improve the reliability of other motors with this same fan weld design, the utility applied this new weld configuration to those motors. This information was supplied to the NRC by this utility in June of 1980. Since that time, no further problems occurred until the recent failure of the motor purchased from the canceled project.

The BWR/4 utility requested that GE-NE determine the root cause of this recent motor fan failure. GE-NE's evaluation concluded that the root cause of failure was a lack of weld penetration between the fan blades and discs.

Safety Basis

GE-NE has concluded that for the BWR/4 utility, this was a random single failure because in 1980 the utility applied the new weld configuration to all of their RHR motor fans. Therefore, only the motor obtained from the canceled project had the potential for failure. This single failure is within the safety design basis of the plant and additional single failures do not have to be considered for this evaluation.

GE has no knowledge of any other BWR plants which have experienced this same kind of fan weld failure in the history of these motors. These motors were built in the early 1960s by the GE San Jose Motor Plant, which is no longer in operation. The GE Motor plant applied this particular fan

weld configuration (single weld) on thirty different motor models. GE-NE does not have complete records of how many of these motor models are in operating nuclear plants. However, it can be conservatively estimated that since 1972, there have been more than one hundred of these motors applied in safety related BWR applications, e.g., Residual Heat Removal (RHR) system and various Core Spray (CS) systems. In addition, since the early 1960s, many more hundreds of these motors have been used in non-safety related and commercial applications. It is therefore reasonable to assume that all of these motors have seen many hours of service through BWR plant start-up testing, plant operation (in the case of the RHR), surveillance (or other testing for the Emergency Core Cooling System motors), non-safety related applications and commercial applications with no known fan weld failure other than the two failures reported by the BWR/4 utility, which were 12 years apart. This history provides a basis for judging the potential for fan weld failure on these motors to be a low probability event.

Corrective Actions and Preventive Measures

GE has not issued a Service Advice Letter (SAL) because the GE facility that originally manufactured the GE motors ceases to exist. However, as a precautionary measure, on October 29, 1992, GE-NE issued a Germane-to-Safety communication to inform their BWR utility customers of this condition. GE-NE recommended that all BWR utilities inspect the fan blade weld on all suspect motor models (attached) for proper weld penetration at the earliest possible time. PWR plants may also be affected by this condition.

New duplicate GE motors are manufactured by GE Canada, Motors and Drive Department. As part of a design improvement, all new surplus motors (except for 5K6337XC124A and 5K6338XC89A) have the double fillet weld incorporated in the weld design.

ATTACHMENT

Suspect Motor Model Numbers

| | | | |
|--------------|--------------|--------------|--------------|
| 5K6346XC74A | 5K6346XC83A | 5K6348XC23A | 5K6348XC29A |
| 5K6346XC73A | 5K6346XC95A | 5K6346XC97A | 5K6346XC94A |
| 5K6347XC122A | 5K6347XC100A | 5K6347XC109A | 5K6348XC94A |
| 5K6348XC109A | 5K6348XC77A | 5K6348XC98A | 5K6348XC84A |
| 5K6348XC102A | 5K6348XC90A | 5K6348XC107A | 5K6348XC47A |
| 5K6346XC102A | 5K6348XC52A | 5K6347XC65A | 5K6347XC59A |
| 5K6348XC39A | 5K6346XC97B | 5K6348XC106A | 5K6348XC133A |
| 5K6348XC132 | 5K6348XC110A | 5K6337XC124A | 5K6348XC127A |
| 5K6338XC125A | 5K6339XC149A | 5K6338XC89A | 5K6358XC3A |
| 5K6326XC234A | 5K6336XC295A | | |

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