

SNUPPS

Standardized Nuclear Unit
Power Plant System

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April 28, 1983

SLNRC 83- 023 FILE: 0491.10.2
SUBJ: Significant Deficiency Report (SDR)
83-05 re GE AKR Circuit Breaker
Deficiency

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Docket Nos. STN 50-482 and STN 50-483

Gentlemen:

On February 11, 1983, NRC Region III representatives were informed by Union Electric Co. of deficiencies at Callaway Site involving defects in GE AKR 30 and 50 electrically operated low voltage circuit breakers. These defects were judged to be reportable under 10CFR50.55(e) criteria. Similar defects were also found at Wolf Creek Site and reported by Kansas Gas and Electric Co. to Region IV on February 28, 1983. The basis of these reports is General Electric Service Advise No. 175-9.11. Since both utilities are involved, SNUPPS was requested on March 11, 1983 to treat this issue as a generic item. Details pertaining to the defects, as well as corrective actions, are described in the enclosed generic report. This report should be considered as a final report on behalf of the SNUPPS Utilities, Union Electric Co. and Kansas Gas and Electric Co.

If additional information or clarification is required, please contact the undersigned.

Very truly yours,

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Enclosure: SDR 83-05

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SUMMARY REPORT
ON
AKR CIRCUIT BREAKER DEFICIENCY
PER
10CFR PART 50.55(e)

SNUPPS PROJECT
BECHTEL POWER CORPORATION
GAITHERSBURG, MD

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1.0 Introduction

On February 11, 1983, the Union Electric Company reported a potential significant deficiency to the NRC involving defects in GE AKR-30 and AKR-50 electrically operated low voltage drawout power circuit breakers. A similar report was made on February 28, 1983, by the Kansas Gas and Electric Company. The basis of these reports is General Electric Service Advise No. 175-9.11. This Service Advise indicates that the above circuit breakers may contain defective parts that could cause the breakers to fail to close on command.

The scope of the Service Advice indicates that all AKR-30 and AKR-50 circuit breakers manufactured prior to May, 1980, may be affected. All of the SNUPPS electrically operated low voltage drawout power circuit breakers fall into this category.

2.0 Description of Circuit Breakers and Deficiency

General Electric electrically operated low voltage drawout power circuit breakers are utilized in the SNUPPS Class 1E electrical distribution system to distribute power to various safety-related and non-safety related loads. These loads generally consist of motors, motor control centers and various static, non-rotating loads.

The circuit breakers are contained within low voltage switchgear assemblies. The assemblies are supplied from dry type distribution transformers, which are in turn supplied from the Class IE medium voltage busses. The low voltage switchgear assemblies are arranged in a double-ended configuration. Two busses, with each bus supplied from a separate transformer, are provided. A normally open tie breaker between the busses is also provided. Sketch 1, attached, depicts the electrical arrangement of the subject circuit breakers.

The deficiency deals with two defective parts supplied with the breakers. A defective switch used in the closing circuit and an improperly heat treated closing prop used in the closing mechanism may render the breaker unable to close.

The closing prop, by being improperly heat treated, suffers deformation when engaged by the ratchet assembly roller upon spring charging. When sufficient deformation has occurred through multiple breaker operating cycles, the closing solenoid may be unable to remove the prop from the roller, as it is designed to do, and the breaker will fail to close.

The failure mode of the defective switch is such that it may not reset when the closing solenoid is de-energized. This failure to reset will set up a relay race in the breaker closing circuit such that the breaker may fail to close when its control switch is operated.

3.0 Safety Implications

As indicated above, GE AKR-30 and AKR-50 low voltage drawout power circuit breakers are utilized in the SNUPPS Class IE electrical distribution system. Virtually all of these circuit breakers are closed and in service during normal plant operations. Upon the occurrence of an accident, these circuit breakers remain closed and continue to supply power to their respective safety load. However, the spent fuel pool cooling pumps and hydrogen recombiners, which are not needed immediately after an accident, are either tripped upon an accident or may not be connected to their bus at the time of the accident. These loads are started manually from the control room when required.

Assuming that the deficiencies described in this report afflict the circuit breakers supplying the spent fuel pool cooling pumps and hydrogen recombiners, the inability to start these loads when required could potentially compromise the ability to maintain the plant in a safe condition.

Similarly, if any operating safety related load supplied by an afflicted circuit breaker were to be momentarily shut down for any reason, the inability to restart it could also potentially compromise the safety of the plant.

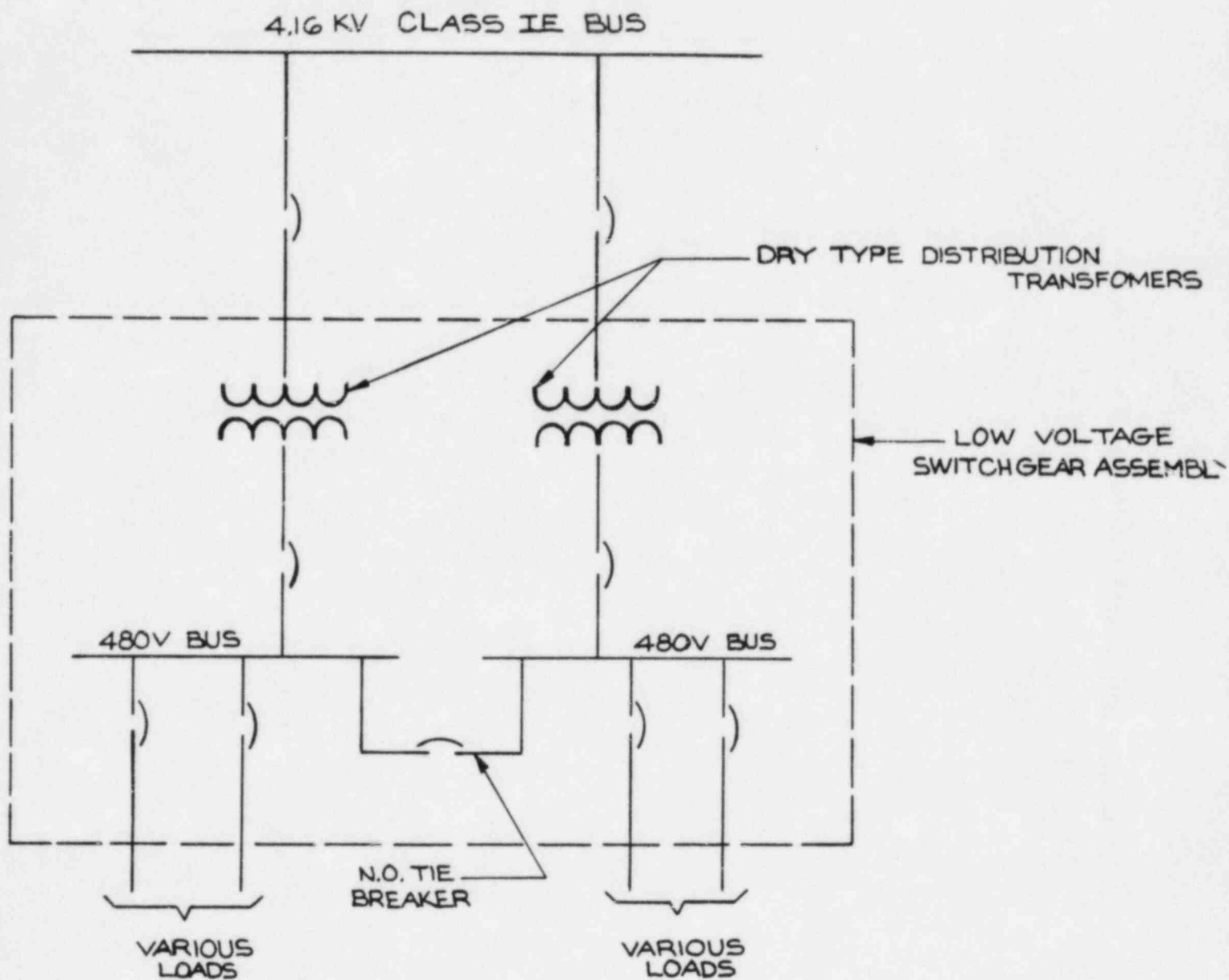
4.0 Resolution and Corrective Action

It is not possible to determine if a specific part is defective by inspection alone. Therefore, in order to rectify all potential deficiencies, a Field Rework Plan will be issued to effect the necessary breaker repairs. The breaker repairs will consist of replacement of the defective switch and closing prop. These repairs will be carried out on all electrically operated AKR-30 and AKR-50 circuit breakers, both safety related and non-safety related, with priority given to the former. This corrective rework is anticipated to be released for construction by June 1, 1983.

The manufacturer of the affected circuit breakers, General Electric, has indicated in the service advice that they are contacting all Nuclear Power Stations, as well as all other users of AKR circuit breakers in critical applications, of the deficiency.

5.0 Conclusions

The SNUPPS Class IE low voltage drawout power circuit breakers were discovered to have a manufacturing deficiency that, if left uncorrected, could render the electrically operated breakers unable to close on command and thus potentially compromise the safety of the plant. The early detection of the deficiency and subsequent correction will assure that the circuit breakers will function as designed and satisfy their safety design basis.



SKETCH 1

TYPICAL LOW VOLTAGE SWITCHGEAR
ELECTRICAL ARRANGEMENT