MCGUIRE NUCLEAR STATION

Report No.: SD-370/79-03

Report Date: May 23, 1979

Facility: McGuire Nuclear Station - Unit 2

Identification of Deficiency: Westinghouse 4 KV Motors
Defective End Finger Spotweld

Description of Deficiency:

During replacement of an electrical lead on a 400 Horsepower, 4000 Volt Motor, at the manufacturer's maintenance facility, a lamination "end plate finger" from the rotor was found in the bottom of the motor's oil pot. These "end plate fingers" are straight rectangular metal pieces approximately 3 1/2 by 3/8 by 1/8 inches which are attached to the end lamination plate by three spotwelds. In addition, they are secured in place by a round lamination pressure plate which applies pressure through the plate fingers to the end rotor laminations. This is illustrated in Sketch #1. The end fingers are to prevent lamination separation at the circumference of the motor. On each end of this rotor, there are 79 slots where end fingers can be used for this purpose. An inspection of the rotor revealed 12 slots that did not contain the end plate finger, however, 11 slots had rotor bars that had been swaged. In instances where the installation of the end fingers during the manufacturing process does not conform to inspection requirements, (i.e. can be flexed by applying on external force which causes inferior welds to break) swaging of a limited number of the rotor bars outside of the last lamination is acceptable in lieu of the end fingers. During the inspection, all fingers on the rotor were tested by applying pressure to the finger's outer edge to determine if any fingers displayed any signs of looseness. Several fingers exhibited some degree of looseness and upon application of additional pressure, five other fingers broke completely loose and were removed. No damage was done by the loose fingers.

This deficiency was reported to NRC Region II as a reportable item under 10CFR 50.55 (e).

The motor is a 4000 Volt, 400 hp, Lifeline D Type LAC Induction Motor manufactured by Westinghouse in its Buffalo facility. The end finger design is only applicable to motors manufactured between February 1971 to September 1974.

Designation of Apparent Cause of Deficiency:

The manufacturer has inspected the motor and has determined that the apparent cause of the deficiency was inadequate control during the inspection process on this specific motor, thereby allowing a rotor with defective spotwelds on end finger plates be installed within a motor and shipped.

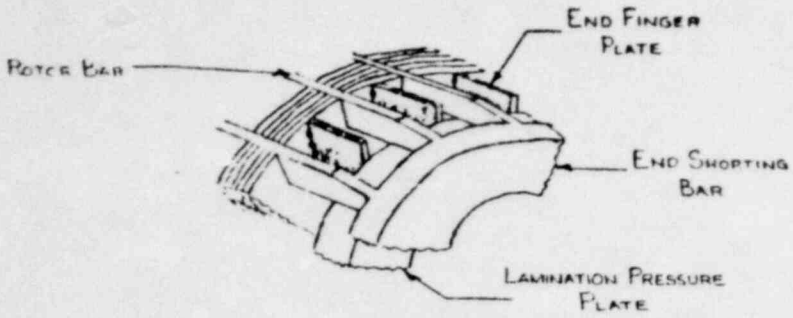
Analysis of Safety Implications:

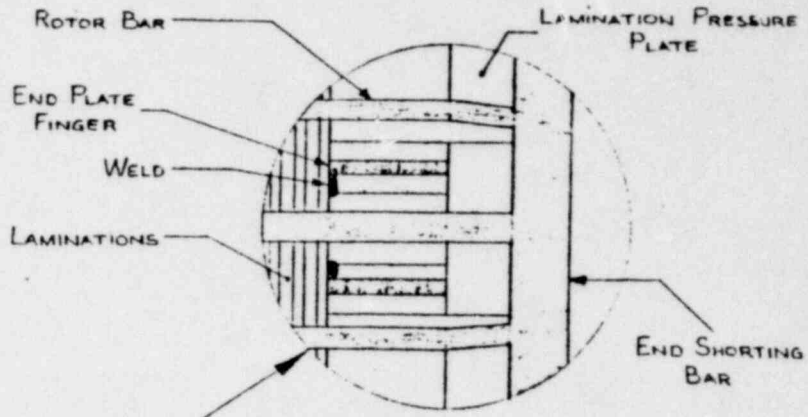
Of the similar type motors in both units, only 12 are associated with essential systems in various applications. Seven of similar type essential and non-essential motors which were manufactured in the same time frame were selected for inspection.

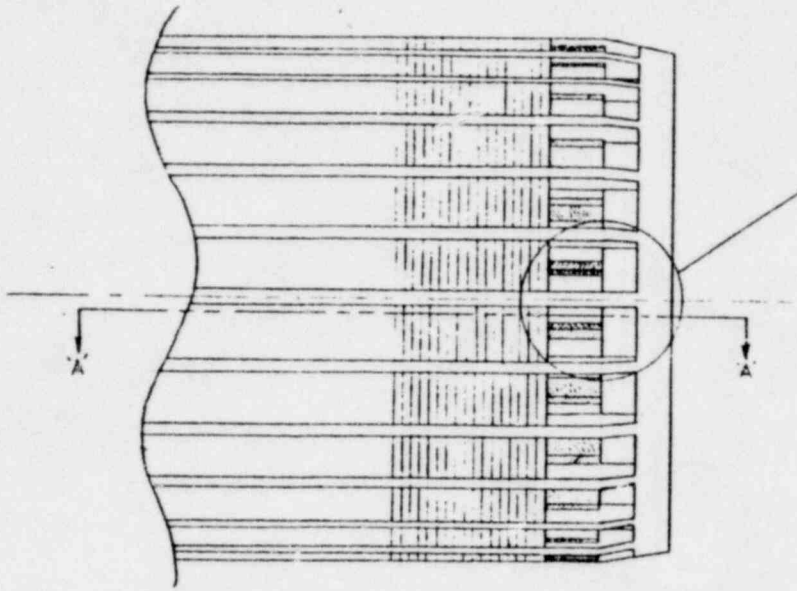
The motors were disassembled and all end finger plates inspected. It was determined that a similar deficiency did not exist on these motors. In addition, the manufacturer has indicated that this is the only recorded spotweld deficiency out of approximately 5500 motors shipped since their spotweld inspection program went into effect. As the unit was in the construction stages, the deficiency only appeared in a single motor, redundant equipment to perform the function would have been available and for the above reasons, the health and safety of the public was not effected.

Corrective Action:

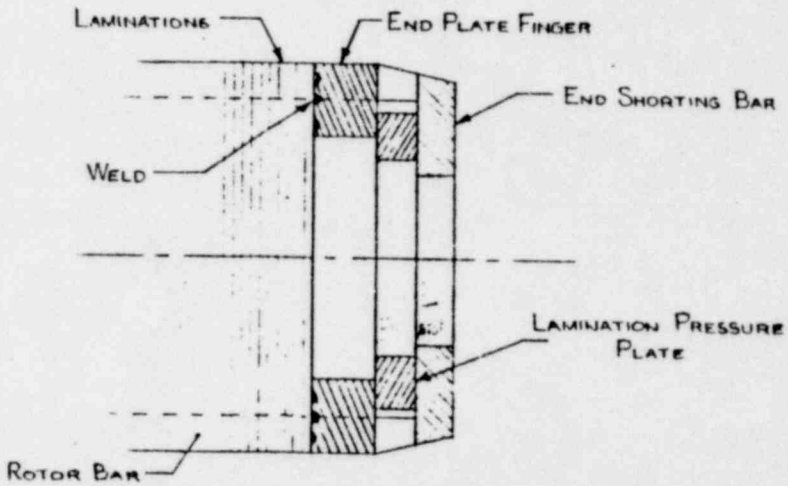
The manufacturer is to provide a new rotor for this motor. It is expected that this rotor will be received and installed by January 1, 1980.







ROTOR



SECTION AT 'A'

Sketch #1
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