

Westinghouse  
Electric Corporation

Water Reactor  
Divisions

Nuclear Technology Division

Box 355  
Pittsburgh Pennsylvania 15230-0355

NS-NRC-89-3439

June 9, 1989

Mr. F. J. Miraglia  
Associate Director for Inspection & Technical Assessment  
Office of Nuclear Reactor Regulation  
United States Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Miraglia:

The following information is provided pursuant to the requirements of 10CFR Part 21 to report the potential for the existence of a substantial safety hazard as communicated by Mr. William Johnson to Mr. Carl Berlinger of the NRC by telephone on June 9, 1989. This issue concerns the increased potential for bearing corrosion on refurbished DS breakers.

#### Background

During the latter part of May 1989, Indian Point 3 reported operational difficulties on receipt inspection with DS-416 breakers which had been recently refurbished by Westinghouse. Seven breakers had been refurbished during their outage and five of the seven failed to close intermittently with reduced voltage (approx. 90V) on the spring release device coil. It was reported verbally that some failed at normal voltages of 125V. Two of these breakers were sent back to Westinghouse for evaluation on June 6, 1989.

The initial Westinghouse evaluation confirmed the findings at the site. Measurements documenting the required force (from the spring release device) necessary to close the breaker were also taken with an average value of about nine pounds. Typical values for acceptable breakers are approximately three pounds. The evaluation determined that the failure to close was due to excessive resistance to movement by a roller bearing which is a subcomponent of the breaker closing cam. The movement of the bearing in one breaker was restored by lubrication. After disassembly of the breaker and closing cam, rust was discovered on the bearings which would inhibit movement of the bearings, therefore, requiring additional force to close the breaker.

The carbon steel bearings are originally purchased with a lubricant to prevent rusting. However, during the refurbishment process performed on these particular breakers, the close cam was replated. As part of this process the total assembly was immersed in an acid bath for cleaning followed by a water bath to stop the chemical process. This cleaning process removed the lubricant and introduced water allowing rusting

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within a few weeks time. To provide confirmation, two breakers that had not been refurbished but had been subjected to extensive cycle testing and typical plant environments for several years were disassembled. No rusting was observed and the bearing contained lubricant.

Westinghouse has reviewed the DS breakers for other parts containing open bearings which may have been replated. The other open bearings are the two crank shaft bearings contained in the mechanism side frames. However, these bearings are accessible and are flushed with a solvent and relubed after the plating process. These three bearings exist in all DS series breakers.

In addition to the seven breakers refurbished for Indian Point Unit 3, Westinghouse has identified seven additional breakers that were refurbished using the same procedures. All are listed with plant identifications on the attachment. Since it is the judgment of the technician as to the need for replating it is not certain that these parts (close cam, side frames) were replated on all breakers. This can be easily verified by checking the color: refurbished will have a gold color, unrefurbished, silver.

Note: The refurbishment process for DB series breakers uses the same plating procedure but all bearings are capable of being removed. No other breakers have been refurbished using these procedures.

#### Safety Impact

The ability of the breaker to close may have an impact on plant safety. In order to assist the utilities in verifying the potential impact to their plant, Westinghouse has provided the guidance shown below involving visual checks, determination of safety function and breaker testing.

#### Corrective Action

Westinghouse is working with New York Power Authority to resolve this issue and has advised the other affected utilities to determine the following:

1. Check the color of the affected parts - continue evaluation if gold.
2. Verify the safety function of the breaker - the bearings only affect the ability of the breaker to close, e.g. reactor trip breakers are not involved.
3. If closing function is identified, as required for safety, the ability of the breaker to close should be verified by applying a reduced voltage (94V) to the spring release device coil and cycling the breaker five times.

Mr. F. J. Miraglia

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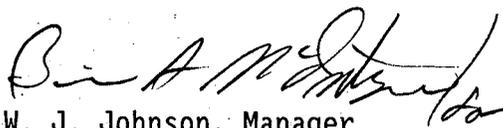
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- a) If any cycle fails, declare the breaker inoperable and replace with spare breaker.
  - b) If initial test is successful, relube all three bearings and restore to service.
4. After declaring a refurbished breaker operable, repeat reduced voltage test quarterly until bearings can be replaced.

If you have any questions regarding this matter, please contact Mr. Pete Morris of my staff at (412) 374-5761, or myself.

Very truly yours,



W. J. Johnson, Manager  
Nuclear Safety Department

RBM/jag:0398C

ATTACHMENT

PLANT	FRAME	SERIAL NUMBER
Sequoyah	DS-532	7-24Y7900B/861.003-1
Sequoyah	DS-206	4-24Y7900B11/880.561-1
South Texas	DS-206	02YN083B5-6/871.446-1
Braidwood	DS-416	02YN095B-1/871.631-1
Byron	DS-206	02YN023B2-4/871.687-1
Byron	DS-206	02YN023B1-17/880.024-1
Zion	DS-206	24Y7092B7-1/880.274-1
Indian Point 3	DS-416	1-24Y7773B8
Indian Point 3	DS-416	24Y5102B7
Indian Point 3	DS-416	24Y7773B4
Indian Point 3	DS-416	6-24Y7773B8
Indian Point 3	DS-416	9-24Y7773B8
Indian Point 3	DS-416	1-24Y7773B9
Indian Point 3	DS-416	3-24Y7773B9