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SUBJECT: Provides info re final assessment of causes & corrective actions associated w/recent 25KV iso-phase BEF incident.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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August 10, 1990
G02-90-136

Docket No. 50-397

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, D.C.

Gentlemen:

Subject: NUCLEAR PLANT NO. 2
LICENSE NO. NPF-2
NRC INSPECTION REPORT 90-14

As requested in the cover letter to the subject inspection report, the purpose of this letter is to provide information pertaining to our final assessment of the causes and corrective actions associated with the recent 25KV iso-phase bus electrical fault incident.

On June 3, 1990 at 1130 hours, while attempting a 500KV Plant backfeed, there was an electrical ground fault in a potential transformer (PT) cabinet located on the 471' elevation of the Turbine Generator Building. The bus bar and PT cabinet were extensively damaged. The electrical ground fault occurred because grounding straps had not been removed prior to reenergizing the bus.

At the time of the event the Plant was in cold shutdown for the annual maintenance and refueling outage, and the electrical ground fault occurred in a non-safety related, balance of plant system. The temporary 500KV backfeed evolution was being performed to provide an additional offsite power supply because the Division 1 Emergency Diesel Generator was out of service.

On June 4, 1990 an accident investigation committee was created to research this incident and determine the root causes. The investigation was conducted by reviewing applicable drawings and procedures; and interviewing personnel from Operations, Plant Technical, and Maintenance.

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As a result of the investigation, the following conclusions were identified:

1. As previously stated, the backfeed evolution was being performed to provide an additional offsite power source. The backfeed was being performed by implementing selected sections of Plant Procedure (PPM) 2.7.12, "500KV Plant Backfeed". This procedure provides operating instructions for implementation of a 500KV Plant backfeed. During this evolution, removal of the grounding straps was under the control of the Clearance Order process.

There were two Clearance Orders on the system at the time of the incident. Clearance Order 90-4-84 had been prepared to implement a 500KV backfeed on April 22, 1990, and a grounding strap was placed on the generator side of the disconnect links. On April 30, 1990 Clearance Order 90-4-453 was written to perform maintenance on the main and normal transformers. This Clearance Order placed grounding straps on the transformer side of the disconnect links. On June 3, 1990 the preventive maintenance was completed on the main and normal transformers, and the decision was made to release Clearance Order 90-4-453 and place the Plant in a configuration such that a 500KV backfeed was available by means of the normal transformers.

However, due to similar terminology pertaining to grounding strap locations on the Clearance Orders, Plant operators misinterpreted the temporary ground strap location descriptions on Clearance Orders 90-4-84 and 90-4-453 as specifying one and the same grounding device. As a result, Plant Operators incorrectly assumed the ground strap on the generator side of the disconnect links was involved with multiple Clearance Orders and would require removal of the tags impacted by Clearance Order 90-4-453 (a standard practice). However, there were two grounding straps installed by these tagouts, one on the generator side and one on the transformer side of the disconnect links.

2. Temporary grounding devices do not have a unique equipment identifier. As a result, the identification of these grounding devices is subject to differences of interpretation.
3. Training and procedures for Operations and Maintenance personnel on the use of grounding devices appear to be inadequate.

The following corrective actions either will be, or have been taken, to prevent such an incident from recurring in the future:

1. The Plant Operator involved who released the Clearance Order was given the appropriate level of disciplinary action.

2. This incident is being discussed during the current Plant Operator Requalification Training Cycle. The discussion involves a detailed review of the event, issues, concerns and followup actions. To date, the incident has been discussed with four out of the six operating crews.
3. A formal training module for Plant Operators (both licensed and non-licensed) will be developed to include a comprehensive discussion of the event, a comprehensive review of all impacted procedures and a comprehensive review of grounding devices.
4. PPM 10.25.141, "Grounding Practices for Electrical Systems", will be revised to include requirements and guidance for installation and removal of temporary grounding devices on high voltage buses. This revision will also address engineered grounding locations and grounding methods.
5. A process will be evaluated for establishing a unique identifier for temporary grounding devices and temporary grounding device locations.
6. PPM 2.7.12 has been revised to require a step-by-step signoff. In addition, information necessary to accommodate any Plant condition prior to initiating a backfeed operation has been included. This revision also links the procedure to PPM 1.3.7, "Maintenance Work Request", PPM 1.3.8, "Danger Tag Clearance Order", and PPM 10.25.141.

In conclusion, the Supply System considers the 25KV iso-phase bus electrical fault incident to be a serious event and, as a result, sound preplanning and execution of work activities cannot be overemphasized in our efforts to improve work practices and provide safe working conditions. Of particular concern pertaining to this incident was the fact that the event was the result of several programmatic barriers being violated. As a result, what is presented in this letter are enhancements to improve several of those barriers. Improvements to the individual implementation of our programs will continue to be made through management/supervisor involvement in daily activities. Therefore, the corrective actions taken or planned are intended to prevent other incidents such as this from occurring.

Very truly yours,

for *AC* *Boachey*
G. D. Bouchey, Director
Licensing & Assurance

cc: JB Martin - NRC Rv
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