



Pennsylvania Power & Light Company

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September 21, 1981

Mr. R. C. Haynes
Director, Region I
U. S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406



SUSQUEHANNA STEAM ELECTRIC STATION
INTERIM REPORT OF A POTENTIALLY REPORTABLE
CONDITION INVOLVING USE OF ELECTRICALLY CONDUCTIVE
CABLE PULLING LUBRICANT
ERS 100450/100508 FILES 840-4/821-10
PLA-929

Dear Mr. Haynes:

This letter serves to provide the Commission with an interim report of a potentially reportable deficiency involving the use of electrically conductive cable pulling lubricant. The lubricant could degrade safety related electrical equipment if not properly controlled to prevent its migration. The potential deficiency was originally reported by telephone to Mr. L. Narrow of NRC Region I by Mr. A. Sabol of PP&L on August 5, 1981. Mr. Narrow was advised that the condition was considered potentially reportable under the provisions of 10 CFR 50.55(e).

The attachment to this letter contains a description of the problem, its cause, safety implications and the corrective action taken and planned.

Since the details of this report provide information relevant to the reporting requirements of 10 CFR 21, this correspondence is considered to also discharge any formal responsibility PP&L may have in compliance thereto.

We expect to issue a final report on the problems in November, 1981. We trust the Commission will find this information acceptable.

Very truly yours,

N. W. Curtis
Vice President-Engineering & Construction-Nuclear

FLW:sab

Attachment

IE27
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Mr. R. C. Haynes

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cc: Mr. Victor Stello (15 copies)
Director-Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. G. McDonald, Director (1)
Office of Management Information & Program Control
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Gary Rhoads
U. S. Nuclear Regulatory Commission
P. O. Box 52
Shickshinny, PA 18655

Flaxoap migration into electrical equipment

Description of Problem

Sherwin-Williams flaxoap is one of the cable pulling compounds used at Susquehanna Steam Electric Station during the cable installation process. The low coefficient of friction exhibited by cables lubricated with flaxoap facilitates cable pulling operations. Additionally, flaxoap's electrical conductivity tends to expose defects in installed cable when megger testing is performed.

However, Flaxoap's conductivity coupled with its tendency for migration resulted in electrical equipment damage in a non-class 1E electrical panel. The flaxoap migrated out of the conduit in which it had been used and caused electrical arcing and burning of the main termination block in the affected electrical panel. Investigation revealed that the conduit raceway involved was totally enclosed (i.e. the conduit raceway ran directly from one electrical panel to the affected electrical panel). It has been postulated that the potential for similar damage in class 1E equipment could exist.

Cause

A review of the conduit sealing requirements in Bechtel Drawing E49 revealed that conduit sealing efforts were directed toward the prevention of external foreign material such as dirt and moisture from entering electrical equipment. Conduit sealing requirements did not address potential problems due to cable pulling lubricants migrating into panels or terminal boxes and onto exposed electrical equipment. Thus, certain types of conduit installations (e.g. totally enclosed raceway) were not required to be sealed. This created the potential for possible equipment damage due to the flaxoap migration.

Analysis of Safety Implication

No class 1E equipment damage due to flaxoap migration has been identified to date at Susquehanna Steam Electric Station. However, the fact that flaxoap has been used in both 1E and non-1E cable pulls and that the conduit sealing requirements are common to both classes, leads to the conclusion that 1E circuits installed in conduit with Flaxoap may be subject to the same failure mode as the cited non-1E circuit experienced.

The failure to identify conduit sealing requirements sufficient to preclude flaxoap migration, given an understanding of its conductivity and tendency to migrate, is considered a design oversight.

Given the nature and extent of the cited condition, engineering considers it to be a significant deficiency in design and quality control, thus potentially reportable under 10 CFR 50.55(e).

Corrective Action

The architect engineer has been requested to revise the conduit sealing requirements to address potential problems inherent with the use of flaxoap as a cable lubricant. The revision will require all conduits entering electrical equipment containing exposed terminations or equipment to be sealed.

A meeting was held on 7/22/81 at Susquehanna Steam Electric Station to discuss the status of conduit sealing and establish an action plan for inspection and sealing of conduits in turned over equipment. The following course of action was agreed upon:

1. In plant areas previously turned over to PP&L, the electrical equipment will be re-inspected to revised conduit sealing requirements by Bechtel and, where necessary, sealed accordingly.
2. In plant areas not turned over to PP&L which, however, contain systems already turned over, the electrical equipment will be re-inspected to revised conduit sealing requirements and sealed accordingly during area turnover. The re-inspection will be conducted jointly by PP&L Construction and Bechtel personnel.
3. Information on safety related equipment requiring further conduit sealing due to the new requirements will be provided to PP&L Engineering for safety impact assessment.

Conclusion

Re-inspection to revised conduit sealing requirements and conduit sealing of previously turned over equipment as found necessary is in progress. This action along with the revised conduit sealing requirements imposed on equipment not yet turned over should eliminate the possibility of equipment damage due to flaxoap migration.