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 RECIPIENT NAME RECIPIENT AFFILIATION
 MILLER, C.L. Project Directorate I-2

SUBJECT: Provides info re failures of & continuing svc problems w/ac SVs mfg by Circle Seal Controls, Inc. Caused by faulty design & mfg. Safety-related applications for subj SVs at SSES investigated. Equipment not basic component, per 10CFR21.

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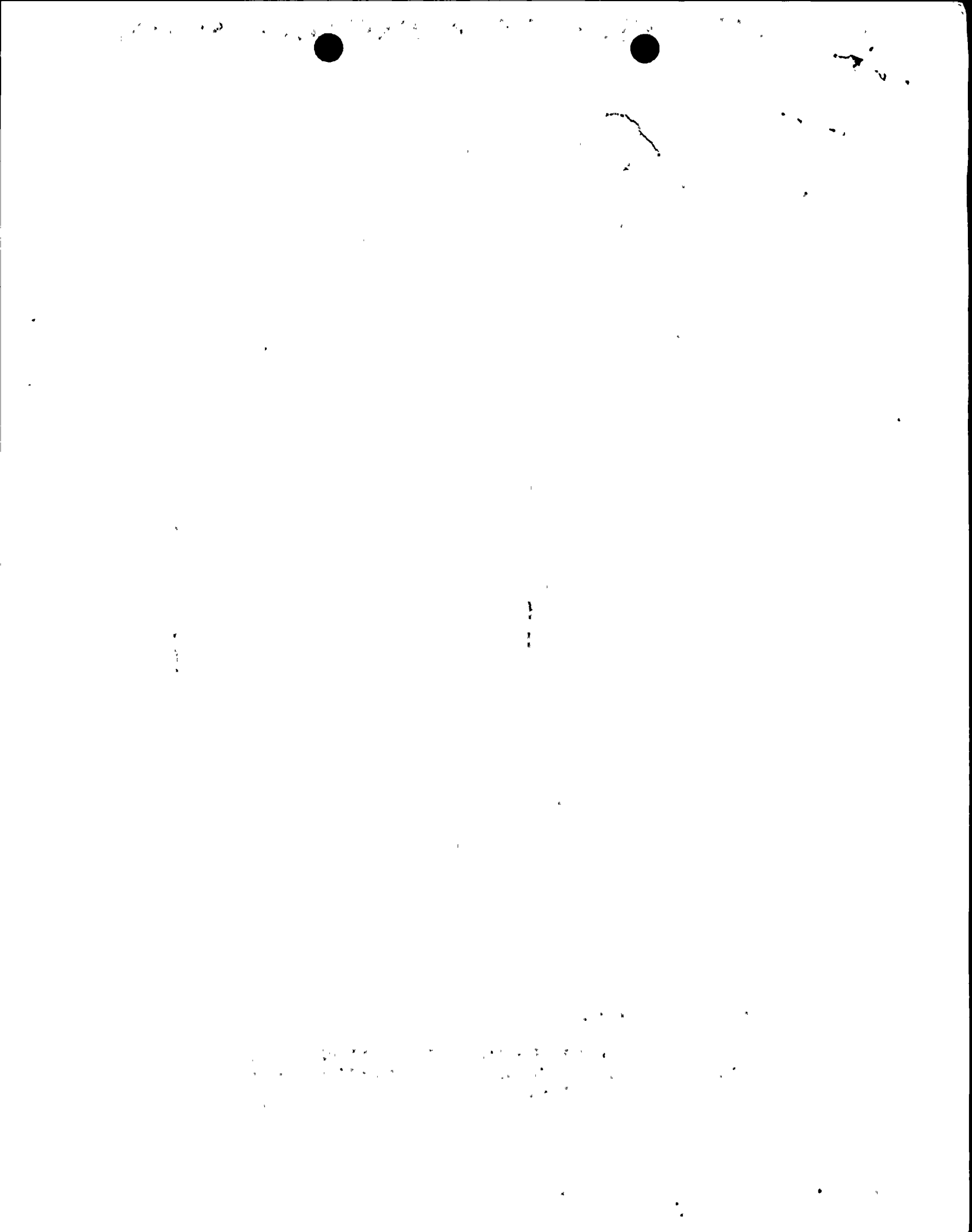
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Director of Nuclear Reactor Regulation
Attention: Mr. C. L. Miller, Project Director
Project Directorate I-2
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

**SUSQUEHANNA STEAM ELECTRIC STATION
FAILURES OF AND CONTINUING SERVICE PROBLEMS WITH
CIRCLE SEAL CONTROLS SOLENOID VALVES
PLA-4059**

FILE R41-2A

Docket Nos. 50-387
and 50-388

Dear Mr. Miller:

This letter serves to provide information regarding failures of and continuing service problems with AC solenoid valves manufactured by Circle Seal Controls, Inc., 2301 Wardlow Circle, Corona, California, 91720. Specifically, the Circle Seal solenoid models of interest are the SV31S and its replacement, the NP30-2.

These solenoids are used in a number of varied applications (safety and non-safety) at Susquehanna. Most of the problems encountered have involved non-functioning of the solenoid due to coil shorting and subsequent burnout. Many of the failures occur within a short time of installation, typically in as little as hours or days. Analysis of the failures by Circle Seal Controls, as well as independent failure analyses have confirmed that the root cause of the failures lies in faulty design and manufacturing. It is thought that the vendor supplying the coils (Rodan Products, Inc.) to Circle Seal Controls failed to properly manufacture the coils by substituting low temperature diodes for the specified high temperature diodes. In addition, a design flaw was discovered showing that the physical location of the diode in the coil causes premature failure of the diode.

All safety-related applications for the subject solenoids at Susquehanna have been investigated. The location and function of each solenoid was determined and a failure mode and effects analysis conducted. In all cases the equipment either fails safe, its failure does not create a substantial safety hazard or the equipment is not a basic component as defined in 10CFR21.

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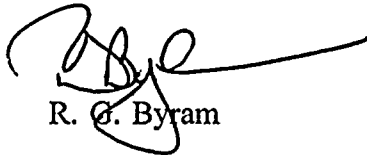
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PP&L now performs additional testing of all Circle Seal Controls solenoid valves prior to installation, which includes a 40 hour energized burn-in test. There have been several NP30-2 failures identified during this testing.

Circle Seal Controls officials indicate that PP&L is the only nuclear utility that is currently supplied with the subject model solenoid valves. PP&L is still pursuing the acquisition of reliable solenoid valves from Circle Seal Controls. Only one premature failure of an installed NP30-2 solenoid, used in a drywell vent containment isolation valve, has occurred as a replacement for the SV31S model. This event was previously reported to NRC by PP&L under LER 93-009 dated 9/20/93.

If you have any questions, please call Mr. J.B. Wesner at 215-774-7911.

Very truly yours,



R. G. Byram

cc: ~~NRC Document Control Desk (original)~~

NRC Region I

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