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AUTH. NAME AUTHOR AFFILIATION
KEISER, H. W. Pennsylvania Power & Light Co.
RECIP. NAME RECIPIENT AFFILIATION
ADENSAM, E. BWR Project Directorate 3

SUBJECT: Forwards response to questions re methodology employed to demonstrate isolation in accordance w/NUREG-0737, Suppl 1 for plant SPDS. Encl provides info concerning test requirements, including max crediable fault levels.

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Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

Harold W. Keiser
Vice President-Nuclear Operations
215/770-7502

APR 14 1986

Director of Nuclear Reactor Regulation
Attention: Ms. E. Adensam, Project Director
BWR Project Directorate No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
SPDS IMUX QUALIFICATION TESTING
PLA-2622 FILES R41-2,A17-13

Docket Nos. 50-387
50-388

Dear Ms. Adensam:

This letter is provided in response to questions from your staff regarding the methodology employed to demonstrate isolation in accordance with NUREG 0737, Supplement 1, for the Susquehanna SES Safety Parameter Display System (SPDS).

Figure 1 provides a simplified block diagram of the test setup, the fault locations and the test monitoring points applicable to additional isolation testing performed upon the SPDS Class 1E multiplexer.

Attachment A provides information concerning test requirements which includes maximum credible fault levels and acceptance criteria.

Essentially, the test required the application of four distinct types of faults. As indicated in Figure 1, these faults were applied to the 120VAC input power cable and the RS422 communications link. Upon application of the faults, the simulated class 1E inputs to the SPDS IMUX were monitored for possible electrical or electronic interference. As a result of maximum credible fault applications, there were no voltage or current transients of a magnitude or duration that caused interference within the simulated 1E circuitry.

The results of the test have been analyzed and the following is concluded:

1. There are no plant safety concerns which result from the existing SPDS input configuration.

2. As a result of the additional isolation testing, it has been demonstrated that SPDS provides suitable isolation from electrical or electronic interference with equipment and sensors that are in use for safety systems.

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Testing where faults were applied to the 1E input circuits was also successfully performed.

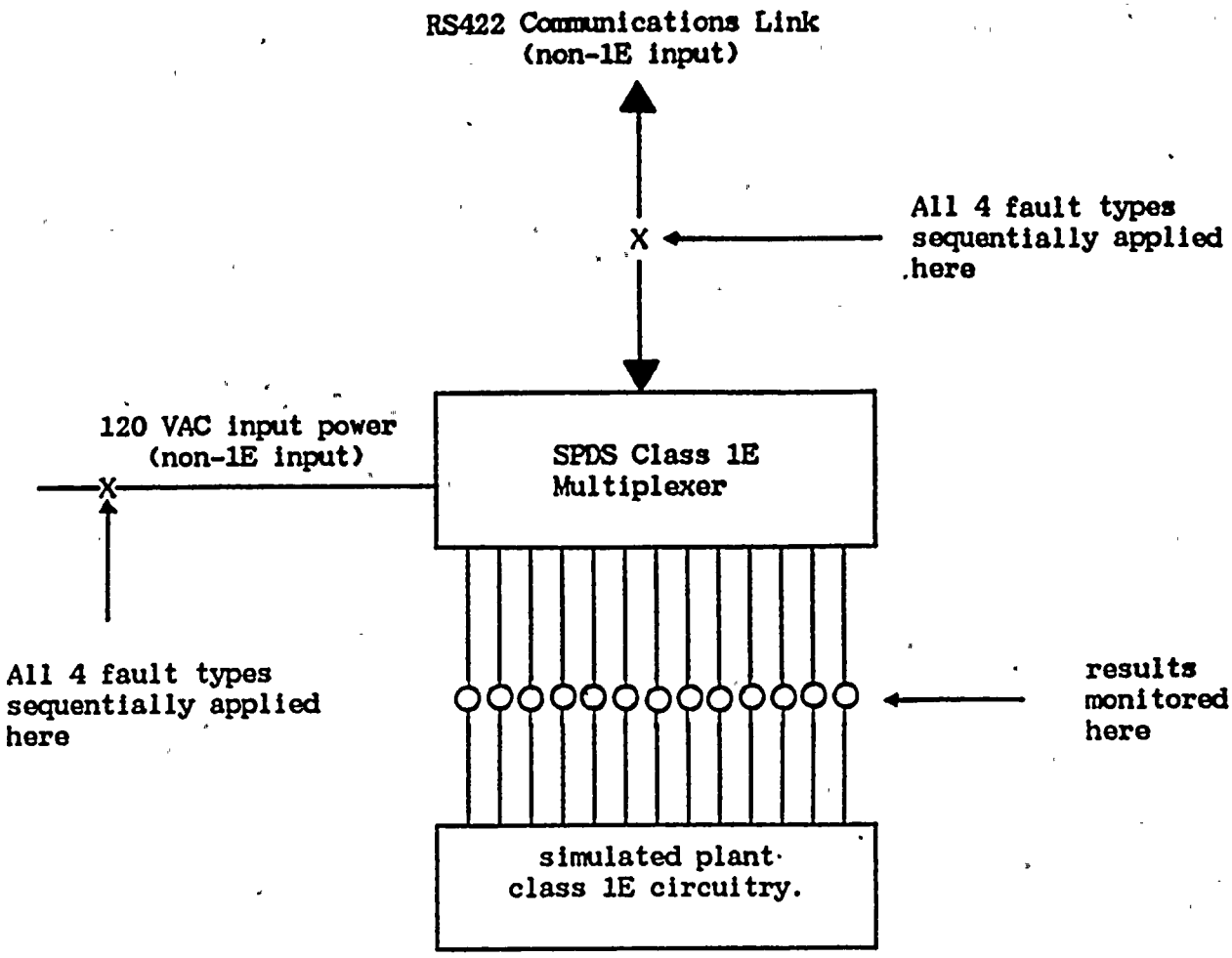
Technology for Energy Corporation (TEC) isolators are not used in 1E circuits in SPDS and, therefore, they do not perform a 1E/non-1E isolation function on SPDS.

This letter completes our response to your staff's questions regarding SPDS IMUX qualification testing. Should you have any questions, please call.

Very truly yours,

H. W. Keiser
Vice President-Nuclear Operations

cc: M. J. Campagnone USNRC
R. H. Jacobs USNRC



Fault Types : 277VAC Common Mode
250VDC Common Mode
277VAC Transverse Mode
250VDC Transverse Mode

FIGURE 1 : Simplified Block Diagram of SPDS Isolation Qualification Test Setup.

Attachment A

SPDS Isolation Qualification Test Parameters and Considerations

Prior to actual testing, the following criteria was determined :

1. Maximum Credible Fault Levels : 277VAC and 250VDC
2. Types of Fault Applications : Common Mode and Transverse Mode
3. Location of Applied Faults : RS422 Communications Link and 120VAC Input Power Cable
4. Acceptance Criteria :

   As a result of maximum credible fault applications, there shall not be any voltage or current transients of a magnitude or duration that would cause interference within the simulated 1E circuitry.