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MURRAY R. EDELMAN
VICE PRESIDENT
NUCLEAR

May 21, 1985
PY-CEI/NRR-0243 L

Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Perry Nuclear Power Plant
Docket Nos. 50-440; 50-441
Fire Protection Audit
Additional Response to Issues

Dear Mr. Youngblood:

The attachments to this transmittal address outstanding Agreements and Issues identified in the "Trip Report" to your letter of 4/16/85. The Trip Report resulted from the NRC Fire Protection Audit (joint Region III and NRR during the week of 3/18/85). These responses in addition to our letters PY-CEI/NRR-0234 L (penetrations), PY-CEI/NRR-249 L (doors/walls), PY-CEI/NRR-0261 L (deviations) address all the NRR Fire Protection audit items.

This information has been incorporated into FPER Revision 4 except for Issues 3, 5, 6, and 7 which will be the subject of FPER Revision 5 following NRC review/concurrence.

If you have any questions, please feel free to call.

Very truly yours,

A. Kaplan for

Murray R. Edelman
Vice President
Nuclear Group

MRE:njc

Attachments

cc: Jay Silberg, Esq.
John Stefano (2)
J. Grobe
J. Ulie, Region III

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Responses to Agreements Fire Protection Trip Report
of 3/18/85 PNPP Audit

Agreement

1. During the audit, we observed numerous fire door assemblies which were not labeled or listed by a nationally recognized testing laboratory as required by our guidelines BTP CMEB 9.5-1, Section C.5.a. The applicant verbally committed to have each fire door assembly labeled, listed or tested in accordance with NFPA 252. We find this acceptable. The applicant will document this commitment in Revision 4 to the Fire Protection Evaluation Report (FPER).

Status

Each fire door assembly which forms part of the rated barriers identified in the FPER will be labeled, listed or tested in accordance with NFPA 252. The fire doors have been examined by a U.L. Representative on-site and deficiencies which affect ratings have been identified. CEI will comply with U.L. requirements for labeled fire door assemblies. FPER Revision 4, states commitment to have fire door assemblies in rated barriers labeled.

The oversized door assemblies observed have not been previously tested. A testing program has been established as noted in our letter of 5/15/85.

Agreements

2. In Fire Area 1AB.3b Auxiliary Building Elevation 620'-6", we noticed cable tray concentrations with greater than six cable trays without automatic sprinkler protection. The applicant verbally committed to install automatic sprinker protection throughout the area. We find this acceptable. The applicant will document this commitment in Revision 4 to the FPER.

Status

Revision 4 of the FPER will identify the addition of partial area automatic sprinkler protection. Specifically, automatic suppression will be provided in the area over concentrated cable trays. This partial area coverage was identified acceptable during the audit. Partial suppression will be identified as a deviation in our Deviations letter which will be forthcoming in response to Issue No. 7 of the Audit Report.

Responses to Issues
Fire Protection Trip Report
of 3/18/85 PNPP Audit

Issue 1.

In our SSER, we found acceptable a gypsum board wall design which had not been tested in accordance with ASTM E-119. During our audit, we observed that gypsum board walls serving as fire rated barriers were not being installed in the configuration we had approved in our SSER. We are concerned that the new configuration will not be able to withstand anticipated fire exposures. The applicant should verify that the new gypsum board wall configuration as installed in the plant is consistent with the configuration reviewed and approved in our SSER.

Status

An analysis of our horizontal gypsum wall (ceiling) configuration was supplied in our letter of 5/15/85.

Issue 2.

In the FPER, the applicant committed to seal all fire barrier penetrations with a material having a fire resistance rating commensurate with the fire rating of the walls and floor/ceiling assemblies. We observed that conduits 4 inches or less in diameter were not sealed in accordance with our guidelines of BTP CMEB 9.5-1, Section C.5.a The applicant should seal all conduits 4 inches or less which penetrate fire barriers in accordance with our guidelines.

Status

As identified during the audit, CEI committed to prepare "Sealing Criteria" establishing which conduits 4 inches or less in diameter we would propose to seal and thereby meet the intent of the guidelines. That criteria was submitted under separate cover on 5/3/85 and will be summarized in FPER Rev. 4.

Issue 3.

To comply with Section C.6.a of BTP CMEB 9.5-1, the fire alarm system should be designed and installed in accordance with NFPA 72D. Information was unavailable during the audit to verify that the fire alarm system had been designed and installed in accordance with NFPA 72D. The applicant should verify that the fire alarm system has been designed and installed in accordance with NFPA 72D.

Status

The fire alarm system, a Honeywell Delta 1000 Proprietary System, is Factory Mutual approved, with components as described in the 1984 edition of the Factory Mutual Approval Guide. In the original FPER, CEI committed to design and install the fire alarm system to NFPA 72D. An evaluation of the system shows it meets the requirements of NFPA 72D 1985, with the exception of the following sections:

2-6.2.3 Secondary Power Supply

The secondary power supply for the alarm system is in accordance with part (b) except for the capacity of the storage batteries. The arrangement of the secondary supply was described in CEI's letters dated March 12, 1982 under Topic 10. The conditions of the 15 min battery supply and effects of the LOCA signal were described in this submittal. The staff had requested that the transfer from battery to standby diesel be made automatically. The existing standby supply is arranged to transfer automatically to the diesel. In addition the battery capacity is now at least 1 hour rather than 15 minutes. The present arrangement meets the other conditions described in our previous submittal and accepted in the SER and in the SER supplements.

3-6.2.2

The signals from automatic suppression systems consist of a single circuit per system. This circuit can transmit an alarm and a trouble signal to the Control Processing Unit (CPU). The alarm signal will indicate that the suppression system has operated due to fire or spurious actuation. A distinct alarm signal will be received.

All supervisory signals (i.e. valve position, panel trouble etc) will be indicated as a supervisory alarm via the trouble circuit. Response to the initiating panel will enable the type of trouble to be determined and cleared. Since the intent of any of the above supervisory signals is to initiate corrective action to restore the system to normal conditions, the supervisory signal provides a distinct trouble alarm.

3-6.4.6 Fire Pumps Supervision

PNPP fire pump supervision has been evaluated in accordance with NFPA 20, Edition 1980 as follows:

Diesel drive controller

1) Engine running - not provided.
2) Main switch to "off" or "manual" position - provided
3) Trouble on controller or engine - provided
4) Failure to start automatically - not required but provided

Electric drive controller

1) Motor running - provided by CEI
2) Loss of power (line side of motor starter, any phase - provided by CEI)

For the diesel drive controller a change has been initiated to connect feature #4 to #3 group and use this circuit to report feature #1. Upon completion of this modification which is scheduled for start-up, the fire pump supervision will comply with NFPA 20.

System Response Time

Another item of concern was the system response time. The system is capable of reporting an alarm within three seconds. The design load for the Honeywell System is 99 data gathering panels and the CEI maximum load is 30 data gathering panels per channel. An alarm report is received within one to two seconds. Within three seconds or less, the CPU will poll all data gathering panels on the channel plus the reporting points of one data gathering panel. Each three seconds a different data gathering panel is polled for each of its respective addresses.

With the initiation of multiple simultaneous alarms, Honeywell indicates that the CPS memory storage can handle 200 to 300 alarms easily, perhaps as many as 500. On the CRT. the first alarm will appear and there will be an indication that a second alarm is waiting. As the operator acknowledges each alarm, the next waiting alarm will appear. The operator always knows when there is an alarm in the waiting mode.

Simultaneous to this CRT action, the printer will immediately print in sequence all alarms as quickly as the printer can operate. The printer is a high speed type and can print each alarm rapidly, faster than the NFPA Standard of 10 seconds and certainly faster than the operator is able to read and act. In summary the fire alarm system response time is well within NFPA limits.

English Language

The language format for the CPU has been evaluated and will be revised prior to operation so that the message will indicate the following:

1) Type of alarm i.e. Fire Detector, Sprinkler System CO_2 Halon System, Supervisory Signal.
2) Information on location of initiating devices, suppression system valve etc.
3) Data Gathering Panel where signal originated.
4) Location of Data Gathering Panel.

The format will identify the names of plant areas and the individual alarm cabinets will be labled with the area covered by each zone of the panel.

Issue 4.

In our SSER, we found the lack of floor drains in the Switchgear Rooms to be an acceptable deviation from our guidelines because the applicant stated all switchgear was installed on pedestals 4 inches above the floor. We found that the 4160V vital switchgear was installed on the floor and not on pedestals as indicated in our SSER. The applicant should provide drainage from the accumulation of water in each Switchgear Room in accordance with NFPA 92M as required by our guidelines.

Status

Drainage for the accumulation of water from fighting a fire in the Division 1 or Division 2 Switchgear Room has been provided for as specified in Chapter 4 NFPA 92M, 1974. Water supplied through hose stream application will be conducted away through the opening of access doors. This will be identified in FPER Rev. 4

Issue 5

In our SER, we indicated that the PGCC had been installed and protected in accordance with NEDO 10466, Revision 2 dated March 1978 which was previously approved by us. During our audit, we noticed that all the cable installed in the PGCC was not Tefzel as previously committed. The use of cable other than Tefzel in the PGCC would require the existing manually CO_2 extinguishing system, used to protect the under floor wire ways to be upgraded to be an automatic system. The applicant should justify the use of a manual fire extinguishing system with the present cable in the PGCC or upgrade the sytem to be automatic.

Status

Topical Report (NEDO 10466-A/Feb. 1979) Auxiliary Systems Branch evaluation indicates that automatic fire suppression is required for "non-tefzel insulated cable based plants." Such plants utilized a significant amount of non-tefzeled insulated cable in their PGCC. At PNPP a very limited amount of non-tefzel cabling is utilized (approximately 17%) and the plant would not be considered a non-tefzel based plant. In the attached letter GE determined that the non-tefzel applications had been reviewed and emphasized that "deep seated burning of the non-tefze' cable insulation (less than 20% of the insulation) in the control room is not possible." In addition GE indicates that delayed fire suppression actuation would be effective for PGCC modules containing less than 20% non-tefzel cabling. Considering the limited amount of non-tefzel cabling, the effective fire suppression capabilities of our 34% design CO_2 concentration and the number of smoke/heat detectors in the subflooring, automatic initiation of the PGCC CO_2 fire suppression system is unwarranted. Control room operators would receive early warning fire alarms prior to the establishement of deep sealed burning and could effectively control the fire either through the use of hand held extinguishers or manual initiation of the fixed CO_2 system.

Issue 6

During our site audit, we tested four fire dampers under simulated (fire) conditions (i.e., smoke detectors actuation withour air flow). Two of the four dampers failed to close. The applicant should identify the reasons for their failure and provide verification that all fire dampers have been installed and tested in accordance with manufacturer's recommendations.

Status

Reasons for Failure

During the recent NRC inspection/audit of PNPP's compliance with 10CFR50 Appendix R, a number of fire dampers were cycled to determine their functional capabilities. The following is a list of the fire dampers cycled and the results.

Fire damper MPL		Results
M25-FDCC-748	Horizontal 2 section	Damper closed
M31-FDRW-402	Horizontal 2 section	Damper closed
M38-FDAB-209	Vertical 2 section	Damper closed
M38-FDAB-217	Horizontal 1 section	Damper did not move
M36-FDOG-402	Horizontal 4 section	All sections closed but did not latch properly.
M23-FDCC-404	Horizontal 2 section	One section did not close completely. One section did not move.

The Engineering evaluation of the damper failures has determined that the causes are generic in nature.

a) Damper failures to close properly has been attributed to the incorrect alignment of the damper blades in the reblading operation. In the open position, the blades are cocked in the housing and binding can occur.

b) Damper failure to latch properly has been attributed to the presence of dirt and debris in the damper sections.

In order to assure proper functioning of the fire dampers in the future, the procedures utilized for testing and surveillance operations will be revised to include the following items:

1) Removal of dirt/debris

2) Free movement of secondary latches

3) Proper stacking of blade pack

Verification of Installation/Test

The fire dampers at the Perry Nuclear Power Plant were installed by the Robert Irsay company using GAI approved design and installation drawings. Recently, the System Engineering Response Team (SERT) completed an evaluation of fire dampers using new criteria received from Ruskin Mfg. pertaining to installation recommendations and performance data. Changes and modifications necessary as a result of the evaluation have been identified and revised engineering criteria is being prepared. Preparations are currently being made by the Project to implement the changes and modifications for dampers located in Appendix 12 rated fire walls prior to fuel load. All modified fire dampers will be subject to retesting under Generic Machanical Test 031 which is being revised to address the items noted earlier. Fire Protection rework and acceptance tests will be witnessed by QA under the Quality Program. Performance of these new activities will provide verification that fire dampers installed in related walls have been installed and tested in accordance with the manufacturer's recommendations.

Issue 7

Applicant is installing fire protection features for safe shutdown equipment which is not in accordance with his previous commitments to satisfy the guidelines of Section C.5.b of BTP CMEB 9.5-1. Such deviations have not been accepted by the staff. The applicant should identify and justify such deviations.

Status

CEI is presently finalizing our deviation package which will be submitted under separate cover PY-CEI/NRR-0261 L.

GENERAL ELECTRIC

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May 3, 1985
PY-GEN/GAI- 2285

Responds to: PY-GAI/GEN-3648
INFORMATION

Mr. W. J. Leininger
Gilbert Associates, Inc.
P. O. Box 1498
Reading, PA 19603

Dear Mr. Leininger:

SUBJECT: FIRE SUPPRESSION IN PGCC FLOOR SECTIONS

Letter PY-GAI/GEN-3648 requested we provide GE concurrence with GAI data on the Perry PGCC fire suppression that a CO_2 system utilizing 34% concentration for 20 minutes would equal or exceed the suppressant capabilities of 6% Halon 1301 for 10 minutes.

The original requirements of 20% Halon concentration for 20 minutes was based on cables with non-Tefzel insulation. A justification was presented to the NRC in letter MFN-29-85 for classifying Tefzel as a surface burning material, recommending a 6% concentration and a 10 minute soaking time for Halon 1301 and including up to 20% non-Tefzel insulated cables in the fill. Letter MFN-58-85 to the NRC, dated May 1, 1985, further amplified several points; one emphasizing that deep seated burning of the non-Tefzel cable insulation (less than 20% of the total insulation) in the control room PGCC is not possible. This letter also references tests conducted at Sandia Laboratories and summarized in NUREG/CR-2607 where fully developed deep seated fires were initiated in cable trays which contained primarily non-Tefzel insulated cables which were then totally flooded with Halon 1301 at a 6% concentration. A 10 minute soak time extinguished the deep seated fire and prevented re-ignition upon re-introduction of air to the tray. The letter states, "The extinguishing action should be just as effective in the PGCC if for some reason discharge of Halon was delayed until a fire had progressed to deep-seated burning in the overall amount of non-Tefzel cable insulation which could be present in a PGCC floor section."

Based on the above, it is our opinion a CO_2 design concentration of 34% and a soak time of 20 minutes, which is consistent with NFPA for total flooding applications with maintained concentration, will provide an equal suppressant capability in the PGCC floor section as 6% Halon 1301 for 10 minutes.

Very truly yours,

SJ Bellows for

R. C. Mitchell
Project Manager
Perry Nuclear Power Plant

RCM:pes/105B

cc: J. J. Larson
W. F. Miotti
P. A. Nichols