

TECHNICAL REPORT

EVALUATION OF SELECTED FIRE DOOR AND DOOR FRAME ASSEMBLIES  
(SUPPLEMENT 3)

by  
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May 1987

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SUMMARY AND CONCLUSIONS

An evaluation of selected fire doors and frames protecting safety related areas was conducted for the Pennsylvania Power and Light Co. (PP&L) at Susquehanna Steam Electric Station, Units 1 & 2. The purpose of the evaluation was to examine certain unlabeled or modified doors and frames, compare them with labeled units and render an opinion on their expected fire resistance.

This evaluation was requested by PP&L as a supplement to the original evaluation contained in a Factory Mutual report dated January 1985, Supplement 1 dated August 1985 and Supplement 2 dated June 1986.

The following conclusions were reached:

1. All frames examined may be expected to provide 3 hours fire resistance subject to the completion of Recommendations 1 and 2 noted in this report.
2. Door 115<sup>R</sup> on Level 779 had a 1-1/2 hour label attached. The door may be expected to provide that level of protection. *7-6-87*
3. Door 175 on Level 676 had a 1-1/2 hour label attached. The door may be expected to provide that level of protection.
4. Door 408 on Level 719 may be expected to provide 1-1/2 hours fire resistance.
5. Door 531 on Level 749 may be expected to provide 1-1/2 hours fire resistance subject to replacement of the missing silencers and installation of a 16 ga. cover plate over the hole which was provided to receive an electromagnetic switch mechanism.
6. The active leaf of Door 712 on Level 799 has been sprung at the top and should be replaced.

I

INTRODUCTION

The plant was visited on April 9, 1987 by W. F. Shield and C. A. Spencer of FMRC. We were accompanied by Mr. S. Davis of PP&L. Five doors and frames were examined during this visit. The assemblies were located in Unit 1 and 2 Reactor Buildings and the Control Building.

Mr. C. A. Spencer is a Registered Professional Engineer in fire protection with 17 years' experience at Factory Mutual. Mr. Spencer has been involved in field and plan review evaluation of fire walls and fire rated assemblies and is now involved in testing and evaluation of fire resistance of building materials and fire rated assemblies.

II

FIRE DOOR AND FRAME EVALUATION

Two labeled fire doors and frames, and three unlabeled fire doors and frames, were examined during this visit to the Susquehanna Steam Electric Station at the request of the Pennsylvania Power and Light Company (PP&L).

2.1 FIRE DOOR FRAMES

All frames examined were found to be fabricated in accordance with the American National Standards Institute, Standard A155.1, and may be expected to provide 3 hours fire resistance subject to completion of Recommendations 1 and 2.

2.2 FIRE DOORS

Two labeled doors with modifications were examined and three unlabeled doors were compared to labeled fire doors to obtain an estimated fire resistance rating.

2.2.1 Labeled Fire Doors with Modifications

Labeled doors with modifications were examined to determine whether the door would still be expected to provide the level of fire resistance indicated on the label.

Door 115-R *from 1-67*

Door 115<sup>R</sup> (Elevation 779, Reactor Building, Unit 2) had a 1-1/2 hour label attached. This door had been modified by addition of an electromagnetic card reading device. Examination indicates this door may be expected to provide 1-1/2 hours fire resistance. (Note: The report of the original fire door evaluation dated January 1985 referenced a Door No. 115 on Elevation 670 of Reactor Building, Unit 1. This is not the same door.)

Door 175

Door 175 (Elevation 676, Control Structure, Lunch Room C-109) had a 1-1/2 hour label attached. This door had been modified by addition of a 10 in x 10 in wired glass light (Model T4G manufactured by Leslie Locke Inc., Atlanta, Georgia). Examination indicates that since this is within the

maximum exposed glass area allowed by National Fire Protection Association, NFPA 80, Standard for Fire Doors and Windows, this door may be expected to provide 1-1/2 hours fire resistance.

### 2.2.2 Unlabeled Fire Doors

Unlabeled fire doors were examined by comparing their construction features with labeled doors.

#### Door 408

Door 408 (Elevation 719, Reactor Building, Unit 2) had no label. This door was compared to Door 115<sup>from 7-6-87</sup> with the following results:

- a. Both doors are the same size.
- b. Both doors have vertical internal stiffeners at approximately 6 in. on center.
- c. Face sheet thickness (18 ga.) and hinge reinforcement (16 ga.) were the same on both doors.
- d. Both doors have mineral wool insulation in the cavity.
- e. Door 408 has a latch throw of 1/2 in. compared to 5/8 in. for Door 115<sup>from 7-6-87</sup>. However, this satisfies the minimum latch throw requirement specified in NFPA 80 for a 1-1/2 hour door.

Based on the above observations, it is concluded that Door 408 would have an expected rating of 1-1/2 hours.

#### Door 531

Door 531 (Elevation 749, Reactor Building, Unit 1) had no label. This door was compared with Door 115<sup>from 7-6-87</sup> with the following results:

- a. Both doors had the same dimensions.
- b. Both doors have vertical internal stiffeners at approximately 6 in. on center as determined using a stethoscope.
- c. Face sheet thickness (18 ga.) and hinge reinforcement (16 ga.) were the same on both doors as determined using a specially adapted micrometer.
- d. Both doors have latch throws of 5/8 in.
- e. Both doors have mineral wool insulation in the cavity.

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It is concluded that Door No. 531 would have an expected rating of 1-1/2 hours subject to completion of the recommended improvements in Section III of this report.

Door 712

An examination of Door 712 (Elevation 799, Reactor Building, Unit 1) showed that the active leaf of this pair of doors had been sprung at the top edge and should be replaced.

III

RECOMMENDATIONS

1. The silencers missing from the frame of Door 531 should be replaced.
2. The opening in the frame of Door 531 which was intended to receive an electromagnetic switch mechanism for a card reader, should be covered with a 16 ga. cover plate.
3. The active leaf of Door 712, which has been sprung at the top, should be replaced with a labeled 1-1/2 hour rated fire door.

DEVIATION REQUEST NO. 3

SUSQUEHANNA STEAM ELECTRIC STATION - UNITS 1 & 2  
FIRE PROTECTION PROGRAM - CONCERN #1  
DOCKETS NO. 50-387  
50-388

APPENDIX A - DEVIATION REQUESTS

DEVIATION REQUEST NO. 3

ATTACHMENT 5