



THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

P.O. BOX 5000 ■ CLEVELAND, OHIO 44101 ■ TELEPHONE (216) 622-9800 ■ ILLUMINATING BLDG. ■ 55 PUBLIC SQUARE

Dalwyn R. Davidson

VICE PRESIDENT

SYSTEM ENGINEERING AND CONSTRUCTION

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April 8, 1982

Mr. A. Schwencer
Chief, Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555



Perry Nuclear Power Plant
Docket Nos. 50-440; 50-441
Response to Request for
Additional Information -
Chemical Engineering Branch

Dear Mr. Schwencer:

This letter and its attachments transmit additional documentation requested by the Chemical Engineering Branch to clarify responses submitted by CEI on March 12, 1982, on the subject of fire protection at PNPP.

Very Truly Yours,

Dalwyn R. Davidson
Vice President
System Engineering and Construction

DRD: mlb

cc: Jay Silberg
John Stefano
Max Gildner
John Stang

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Question Topic 13: Qualification of fire barriers and penetration seals.Response:

The Chemical Engineering Branch requested that CEI provide documentation justifying that gypsum walls used in PNPP will provide a 3 hour fire barrier as required by SRP Section 9.5.1(c)(5)(a)(1). In the table below, we present a favorable comparison between a U. S. Gypsum 3 hour gypsum wall design (which was recently tested by Underwriter Laboratories) with the Perry 3 hour gypsum wall design.

U. S. Gypsum - UL tested
3 Hr. Wall

PERRY WALL DESIGN

Studs: 25 ga. steel x 1 5/8" @ 24" cc

18 ga. stl. x 4" @ 24" cc
18 ga. stl. x 4" @ 16" cc
16 ga. stl. x 4" @ 16" cc
16 ga. stl. x 4" @ 8" cc
14 ga. stl. x 4" @ 16" cc
14 ga. stl. x 4" @ 12" cc
16 ga. stl. x 6" @ 16" cc
14 ga. stl. x 6" @ 16" cc
18 ga. stl. x 8" @ 16" cc
14 ga. stl. x 8" @ 8" cc

First Layer: 1/2" USG Firecode 'C', vert.
w/1" Type S, 48" cc @ stud

1/2" Gold Bond type X, vert.
x/1 1/4" BugleHead, 16" cc @ stud.
1/2" Furring Strip 2'-0" cc horiz.
w/1 1/2" BugleHead W stud.

Second Layer: 1/2" USG Firecode 'C' vert.
w/1 5/8" Type S, 48" cc @ stud,
staggered jts.

1/2" Gold Bond Type X vert.
w/1 1/8" BugleHead, 16" cc @
furring, staggered jts.

Third Layer: 1/2" USG Firecode 'C', vert.
or horiz. w/2 1/4" Type S, 12"
cc @ stud, staggered jts.

1/2" Gold Bond, Type X, vert. or
horiz. w/1 5/8" BugleHead, 12" cc
@ furring, staggered jts.

+ USG Type S screws - Bugle Head per
ASTM 646

+ Bugle Head - Triangle Fastener
Corp. per ASTM 646

+ USG Firecode 'C' meet ASTM C36
Type X

+Gold Bond Type x meet ASTM C36
Type X

Attached for your review are the following letters:

1. Letter of March 26, 1982, from U. S. Gypsum Company to Gilbert Associates, R. C. Noll.
2. Letter of March 25, 1982, from R. C. Noll, Gilbert Associates to U. S. Gypsum Research.

UNITED STATES GYPSUM COMPANY //

1000 East Northwest Highway, Des Plaines, Illinois 60016

RESEARCH CENTER
AREA CODE 312
CYPRESS 9-3381

March 26, 1982

Gilbert Assoc. Inc.
P. O. Box 1498
Reading, PA 19603

Attention: Mr. Ron Noll

Dear Mr. Noll:

This is in reference to our telephone conversation of 25 March in which we discussed fire-resistance ratings of various wall systems.

As we discussed, Underwriters Laboratories has recently conducted a fire-resistance investigation that has led to a four-hour and a three-hour rating for wall systems employing the U. S. Gypsum Company's SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels. Underwriters is expected to complete their report of this investigation within the next six weeks. The systems that will be rated by U. L. are as follows:

Four-Hour Fire Resistance Classification

Studs: 25 ga. steel or thicker, 1-5/8 inch depth or greater (USG 158ST5) spaced 24 inches c. to c.

Facings: Four layers of 1/2 inch SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels screw-attached to each side of the stud.

Screw Attachment:

First Layer: SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels applied vertically and attached with 1 inch Type "S" Screws spaced 48 inches c. to c. to each stud.

Second Layer: SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels applied vertically with joints staggered from first layer and attached with 1-5/8 inch Type "S" Screws spaced 48 inches c. to c. to each stud.

Third Layer: SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels applied vertically with joints staggered from second layer with 2-1/4 inch Type "S" Screws spaced at 48 inches c. to c. to each stud.

Fourth Layer: SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels applied horizontally or vertically and attached with 2-5/8 inch Type "S" Screws spaced at 12 inches c. to c. to each stud.

Three-Hour Fire Resistance Classification

Studs: 25 ga. steel or thicker, 1-5/8 inch depth or greater (USG 158ST5) spaced 24 inches c. to c.

Facings: Three layers of 1/2 inch SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels screw-attached to each side of the stud.

Screw Attachment:

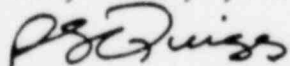
First Layer: SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels applied vertically and attached with 1 inch Type "S" Screws spaced 48 inches c. to c. to each stud.

Second Layer: SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels applied vertically with joints staggered from first layer and attached with 1-5/8 inch Type "S" Screws spaced 48 inches c. to c. to each stud.

Third Layer: SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels applied horizontally or vertically and attached with 2-1/4 inch Type "S" Screws spaced 12 inches c. to c. to each stud.

It should be noted that both the three-hour and four-hour wall systems were achieved using 1/2 inch SHEETROCK Brand FIRECODE "C" Gypsum Wall Panels to provide the fire-resistant membrane. This gypsum panel product is made by the U. S. Gypsum Company and is unique to them.

Very truly yours,



P. S. Quigg
Manager, Structural &
Fire Testing Laboratory

PSQ/a



Gilbert/Commonwealth engineers and consultants

GILBERT ASSOCIATES, INC., P. O. Box 1498, Reading, PA 19603/Tel. 215 775-2600/Cable Gilasoc/Telex 836-431

March 25, 1982

RECEIVED

MAR 26 1982

GILBERT ASSOCIATES, INC.

ARCH. DEPT.

U.S. Gypsum Research
1000 East Northwest Highway
Des Plaines, Ill. 60016

Attention: Mr. Paul Quigg (312-299-3381)

Re: Perry Nuclear Power Plant
The Cleveland Electric Illuminating Co.
3 HR Fire walls

Dear Mr. Quigg:

Thank you for the telephone conversations of Wednesday and Thursday, March 24 and 25 concerning the 3 HR Firewalls at the Perry Nuclear Power Plant and the recent UL testing.

As explained yesterday, the NRC has requested that we compare the GAI/Perry design of 3 HR firewalls to a tested ASTM E-119 assembly. The GAI/Perry design is based on the NFPA Handbook for Estimates by Interpolations and consists of:

4" steel studs, 18 ga. min. x 24" o.c.	
1 layer - $\frac{1}{2}$ " Type x Gypsum Bd.	
1 horiz. - $\frac{1}{2}$ " Furring 2'-0" o.c.	
2 layers - $\frac{1}{2}$ " Type x Gypsum Bd.	Each side

I have discussed the U.S. Gypsum assembly with Mr. Dan Swytnyk of UL, but he was unable to release any information on the test and assembly description, except to U.S. Gypsum.

Please send me a description of the tested U.S. Gypsum assembly from the 3 HR UL Listing. Thank you very much for your time and information.

Very truly yours,

R. C. Noll
Registered Architect
Project Architect

RCN:slg

cc: P.B. Gudikunst (2)
J.D. Grier
J. Hilbish