

PLC *Professional Loss Control, Inc.*

STRUCTURAL STEEL ANALYSIS
for
LIMERICK GENERATING STATION

Control Structure El. 180'

Corridor 166

Fire Area 18

December 20, 1983

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LIMERICK GENERATING STATION

1. AREA DESCRIPTION

The area under consideration is Corridor 166 on the 180' elevation of the Control Structure (Fire Area 1B) (see Attachment A for sketch of area). Bounding walls are of reinforced concrete construction with an average thickness of 3 feet. Total surface area for heat transfer is approximately 1980 ft² (184 m²) (see Attachment A for calculation of areas).

2. COMBUSTIBLE LOADING

Combustible loading in this area consists of two cable trays which run north-south across the corridor. The total surface area of the trays is 32 ft². The average combustible loading of the cable trays is 3 lbs/ft² of tray surface area. There are no combustible liquids in this area.

3. VENTILATION PARAMETERS

Both ends of the corridor are open. The west end opening measures 8' wide by 8' high. The east end of the corridor leads to an open stairwell serving the upper elevations.

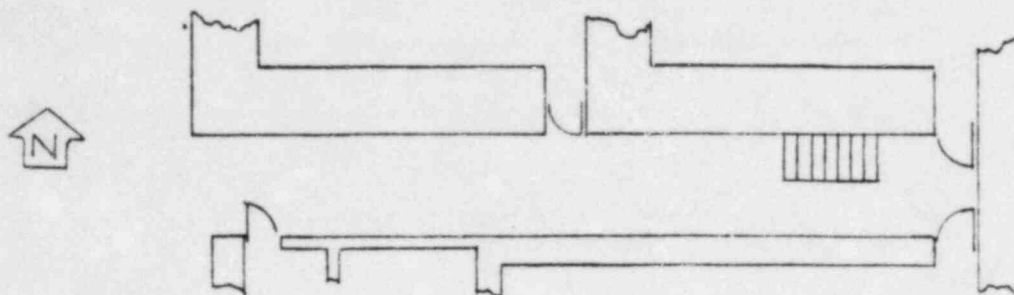
4. CASES EXAMINED

With the light combustible loading in the area, the assumption that all cables are burning simultaneously would present the worst case. With all cable trays burning, a surface area of 32 ft² would be involved. This corresponds to a heat output of approximately 60kW. With all cables assumed to be burning simultaneously, the duration of the fire would be

$$3 \text{ lbs/ft}^2 \div \frac{.1 \text{ lb}}{\text{min ft}^2} = 30 \text{ minutes.}$$

5. RESULTS

With all cable trays in the area burning simultaneously, a fire temperature of 90°F was reached after 30 minutes (see Attachment B). None of the cable trays in the area were positioned so as to present a localized heating exposure to structural steel.



Control Structure El. 180'
Corridor 166

Surface Area Calculations

Walls

North wall	(45' x 18')	810 ft ²
South wall	(45' x 18')	810 ft ²

<u>Ceiling</u>	(45' x 8')	<u>360 ft²</u>
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Total Surface Area for Heat Transfer		1980 ft ²
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CASE NUMBER: 1
 BUILDING: CONTROL STRUCTURE
 ELEVATION AND AREA DESCRIPTION: 180' CORRIDOR 166
 CASE DESCRIPTION: OPEN CORRIDOR ENDS ALL CABLES BURNING

CEILING/WALL THICKNESS (ft)	CEILING/ WALL MATERIAL	Ao (ft2)	Ho (ft)	Aw (ft2)	Q (kW)
3.0	CONCRETE	64.0	8.0	1980	60

FIRE IS FUEL CONTROLLED

FIRE DURATION (min)	GAS TEMPERATURE (deg.F)
5	79
10	82
15	85
20	87
25	89
30	90