

PLC *Professional Loss Control, Inc.*

STRUCTURAL STEEL ANALYSIS
for
PEACH BOTTOM GENERATING STATION

Calculation No. 93

Unit 2,3

Turbine Building El. 116'-0"

Health Physics Utility Room

Fire Area 82

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PEACH BOTTOM GENERATING STATION

1. AREA DESCRIPTION

The area under consideration is the Health Physics Utility Room on the 116'-0" elevation of the Turbine Building (Fire Area 82). The bounding walls are constructed of reinforced concrete with an average thickness of 1 ft. The total surface area for heat transfer is 904 ft² (see Attachment A for a sketch of the area under consideration).

2. COMBUSTIBLE LOADING

There are no combustible liquids or cable trays located in this area.

3. VENTILATION PARAMETERS

There is one door which enters this area.

<u>Door</u>	<u>Size</u>	<u>Location</u>
121	3'-0"x 7'-0"	South Wall

4. CASES EXAMINED

Since there are no exposed fixed combustibles in this area, no cases were examined for a general room fire.

5. RESULTS

No general room fire was postulated because of the lack of exposed fixed combustibles in the area.

There are no cable trays in this area to present a localized heating exposure to the structural steel.

6. EFFECTS OF TRANSIENT COMBUSTIBLES

This area contains no exposed fixed combustibles. The table below lists the maximum heat release rate for transient combustibles for different fire durations which result in an area temperature less than 1100°F.

<u>Fire_Duration</u>	<u>Q/A (kW/m²)</u>	<u>Q (kW)</u>
1 hour	10.5	882
2 hours	8.0	672
3 hours	6.5	546

The distance between the floor and the deepest beams supporting the ceiling is 16'-8 1/2". The heat release rates required of floor level transient combustible fires to produce plume temperatures of 1100°F, 1300°F and 1500°F at the bottom

flange of the beam have been determined and tabulated below. For the temperatures greater than 1100°F the time required to heat the sides of the beams supporting the ceiling have also been determined.

<u>T(°)</u>	<u>Q(kW)</u>	<u>Time to 1100°F (min)</u>
		<u>W16 x 96</u>
1100	7,257	-
1300	9,549	38
1500	12,042	26