

PLC Professional Loss Control, Inc.

STRUCTURAL STEEL ANALYSIS
for
PEACH BOTTOM GENERATING STATION

Calculation No. 91

Unit 2,3

Turbine Building El. 116'-0"

Radiation Chemistry Lab

Fire Area 78C

Prepared by:

Bruce H. May

Date: 5-24-85

Reviewed by:

J. M. Dewey

Revision: 0

8506100716 850606
PDR ADOCK 05000277
F PDR

PEACH BOTTOM GENERATING STATION

1. AREA DESCRIPTION

The area under consideration is the Radiation Chemistry Lab on the 116'-0" elevation of the Turbine Building (Fire Area 78C). The bounding walls are constructed of reinforced concrete with an average thickness of 1 ft. The total surface area for heat transfer is 2,334 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 are two doors which enters this area.

<u>Door</u>	<u>Size</u>	<u>Location</u>
117	3'-0"x 7'-0"	East Wall
118	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

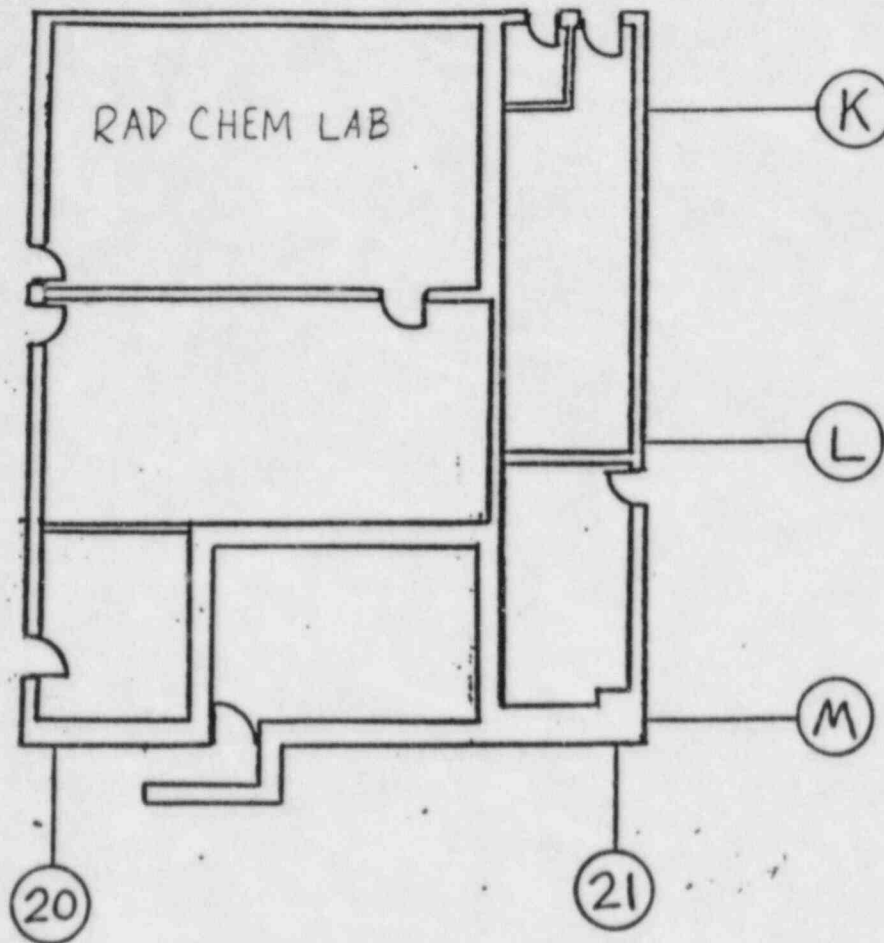
This area contains no exposed fixed combustibles. The table below lists the maximum heat release rate for transient combustibles for different fire durations which result in an area temperature less than 1100°F.

<u>Fire Duration</u>	<u>Q/A (kW/m²)</u>	<u>Q(kW)</u>
1 hour	10.5	2,277
2 hours	8.0	1,735
3 hours	6.5	1,409

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 sizes 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>W12_x_27</u>	<u>W16_x_36</u>	<u>W16_x_96</u>
1100	7,257	-	-	-
1300	9,549	13	14	38
1500	12,042	9	10	26



Unit 2,3 Turbine Building El. 116'-0"
Radiation Chemistry Lab

Surface Area Calculation

<u>Walls</u>		
North wall	(19' x 18')	342 ft ²
East wall	(30' x 18')	540 ft ²
South wall	(19' x 18')	342 ft ²
West wall	(30' x 18')	540 ft ²
		<hr/>
Ceiling	(30' x 19')	1,764 ft ²
		570 ft ²
		<hr/>
Total Surface Area for Heat Transfer		2,334 ft ²