TABLES AND PLOTS SUPPORTING THE PHASE 2 RISK QUANTIFICATION

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Overview of Attachment 8

This attachment consists of a collection of tables and plots that are used in support of a Phase 2 assessment. Various Fire Dynamics Tools (FDTs) from NUREG 1805 were used to generate the data that are presented in the tables and plots. To automate the process the FDT calculations were implemented in a series of spreadsheets. The assumptions and background for these calculations is discussed in Section 06.03 of IMC 0308, Attachment 3, Appendix F.

As an alternative to using the pre-calculated tables and plots, the analyst may choose to use the FDT spreadsheets supplied with NUREG-1805 to perform custom calculations. This approach would be useful to analyze cases for which the input parameters are outside the range of what was considered in the development of the tables and plots, or for which the assumptions may be either unconservative or overly conservative.

A total of eight sets of tables and plots (labeled A-H) were developed. The sets are briefly described below.

Set A - Vertical and Radial Zone of Influence (ZOI):

Table/plot set A provides the vertical and radial ZOI for fixed and transient ignition sources, and for confined liquid fuel pool fires and unconfined liquid fuel spill fires. It is used to screen ignition sources that cannot cause damage to components or cables in the fire area and that are not capable of causing fire to spread to secondary combustibles (Step 2.3.2), and to identify the damaged target set for a specified FDS 1 scenario (Step 2.5.1).

Set B - Minimum Heat Release Rate (HRR) to Create a Damaging Hot Gas Layer (HGL):

Table/plot set B provides the minimum HRR that is needed to create damaging HGL conditions for a range of compartment sizes and different target types. It is used to screen ignition sources that are not capable of generating a damaging HGL (Step 2.3.3), and to identify scenarios involving secondary combustibles that can cause development of a damaging HGL in the fire area (Step 2.5.2).

Set C - HRR Profiles of Fires Involving Cable Trays for Different Ignition Sources:

Table/plot set C provides the combined HRR of an ignition source and a vertical stack of between one and seven horizontal cable trays as a function of time for various ignition source-cable tray configurations. This set is used in conjunction with table/plot set B to determine if and when a fire scenario involving secondary combustibles will cause a damaging HGL in the fire area (Step 2.5.2).

Set D - Severity Factor versus Vertical Target Distance:

To develop table/plot set D, calculations were performed to determine the highest elevation at which a target will be damaged or a secondary combustible will ignite when the ignition source reaches the HRR that corresponds to a specified Severity Factor (SF). Each table and plot provides the elevations corresponding to SFs ranging from 0.02 to 0.95 for one of the fixed or transient ignition sources listed in Attachment 5, located either in the open or in a corner. Table/plot set D is used to conservatively estimate the SF for a target or secondary combustible located within the vertical ZOI based on its elevation above the ignition source (Step 2.6.1).

Set E - Severity Factor versus Radial Target Distance:

To develop table/plot set E, calculations were performed to determine the longest radial distance at which a target will be damaged or a secondary combustible will ignite when the ignition source reaches the HRR that corresponds to a specified SF. Each table and plot provides the radial distances corresponding to SFs ranging from 0.02 to 0.95 for one of the fixed or transient ignition sources listed in Attachment 5. Table/plot set E is used to conservatively estimate the SF for a target or secondary combustible located within the radial ZOI based on its distance from the ignition source (Step 2.6.1).

Set F - Failure Time versus Vertical Target Distance:

Table/plot set F is used to conservatively estimate the damage time of a target or the ignition time of a secondary combustible located within the vertical ZOI based on its elevation above the ignition source. This time is used in the calculation of the non-suppression probability (Step 2.7.1).

Set G - Failure Time versus Radial Target Distance:

Table/plot set G is used to conservatively estimate the damage time of a target or the ignition time of a secondary combustible located within the radial ZOI based on its radial distance from the ignition source. This time is used in the calculation of the non-suppression probability (Step 2.7.1).

Set H - Detector Actuation and Sprinkler Activation Times:

Table set H consists of three subsets:

- Tables to determine smoke detector actuation time as a function of the ceiling height above the fire and the radial distance between the detector and the fire (Step 2.7.2).
- Tables to determine sprinkler activation time for fixed and transient ignition source fires as a function of the ceiling height above the fire and the radial distance between the sprinkler head and the fire (Step 2.7.3).
- Tables to determine sprinkler activation time for fires with a priori unknown HRR profile as a function of the ceiling height above the fire and the radial distance between the sprinkler head and the fire (Step 2.7.3).

Appendix A. VERTICAL AND RADIAL ZONE OF INFLUENCE TABLES AND GRAPHS

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Set A: Overview and Assumptions

Table/plot set A provides the vertical and radial ZOI for fixed and transient ignition sources, and for confined liquid fuel pool fires and unconfined liquid fuel spill fires. It is used to screen ignition sources that cannot cause damage to components or cables in the fire area and that are not capable of causing fire to spread to secondary combustibles (Step 2.3.2), and to identify the damaged target set for a specified FDS 1 scenario (Step 2.5.1).

The assumptions and background for the calculations performed to develop the tables and plots in set A are discussed in Section 06.03.01 of IMC 0308, Attachment 3, Appendix F. The principal assumptions are as follows:

a. Ambient air properties: It is assumed that T_a = 77°F. This is the default value in FDT 9.
b. Convective part of the HRR, $\dot{Q}_c$: A convective fraction (χ_c) of 0.70 is assumed, which is representative of transient fires and conservative for cable fires. This is the default value in FDT 9.
c. Radiative part of the HRR, $\dot{Q}_r$: The radiative part of the HRR is equal to $\chi_r \dot{Q}$, where χ_r is the radiative fraction, and $\dot{Q}$ is the HRR. Theoretically the sum of the convective and radiative fractions is equal to one, implying that χ_r should be equal to 0.3 since χ_c = 0.7.
d. HRR, $\dot{Q}$: Ignition source screening for electrical enclosures, motors, pumps and transients is based on the 98th percentile of the peak HRR, as recommended in NUREG/CR-6850, Volume 2. The HRRs that were used in the vertical ZOI calculations are the 98th percentile peak HRRs given in Table A5.1 in Attachment 5, combined with the 75th percentile HRR of small electrical enclosures (from NUREG-2178, Table 7-1). Tables and plots were created that provide the vertical and radial ZOI for the 12 HRRs. In addition, vertical and radial ZOI vs. HRR plots were developed that cover the entire range of HRRs. Tables and plots were also developed that show the ZOI as a function of fire diameter for confined pool fires involving selected liquid fuels. Similar tables and plots were developed for unconfined spill fires that show the ZOI as a function of the volume of the fuel spill.
e. Fire diameter, D: The fire diameter is determined based on the assumption that the Froude number is equal to one. This assumption leads to reasonably conservative (i.e., small) fire diameters, as shown in Table 6.2.8 of of IMC 0308, Attachment 3, Appendix F.
f. Fire elevation (z = 0): The following guidance is used to determine the elevation of the fire base:
    1. For electrical enclosures, the fire base is placed at 1 ft. below the top of the enclosure as determined from a walkdown.
    2. For motors and pumps it is recommended to place the fire base at the top of the ignition source as determined from a walkdown.
    3. For transients a height of 2 ft. is recommended, and the fire base is at the top.
    4. Confined liquid pool fires and unconfined liquid spill fires are placed on the floor.

    The vertical ZOI tables and plots for electrical enclosures are based on the distance between the top of the enclosure and the target. Since the fire base is at the top of other fixed and transient ignition sources, the ZOI read from the plot in Figure A.01 shall be increased by 1 ft. for motor, pump, and transient fires.
g. Fire location effects: Vertical ZOI tables and plots for fixed and transient ignition sources were developed for fires away (> 2 ft.) from walls and corners (referred to as “free-burn”), and for fires within 2 ft. of a corner. At the discretion of the analyst, a fire within 2 ft. of a wall can be treated either as a corner or as a free-burn fire.

Vertical ZOI for Electrical Enclosure Fires (ft.)				
HRR	Free-Burn Plume		Corner Plume	
(kW)	Thermoset	Thermoplastic	Thermoset	Thermoplastic
15	1.3	2.1	2.9	4.2
45	2.6	3.8	5.0	7.1
130	4.5	6.3	8.1	11.4
170	5.1	7.1	9.2	12.8
200	5.5	7.7	9.9	13.7
325	6.9	9.6	12.2	16.9
400	7.6	10.5	13.3	18.4
700	9.7	13.4	16.9	23.3
1000	11.4	15.6	19.7	27.0

Vertical ZOI for Motor, Pump, and Transient Fires (ft.)				
HRR	Free-Burn Plume		Corner Plume	
(kW)	Thermoset	Thermoplastic	Thermoset	Thermoplastic
69	4.2	5.7	7.1	9.6
211	6.6	8.9	11.1	15.0
317	7.8	10.5	13.1	17.7

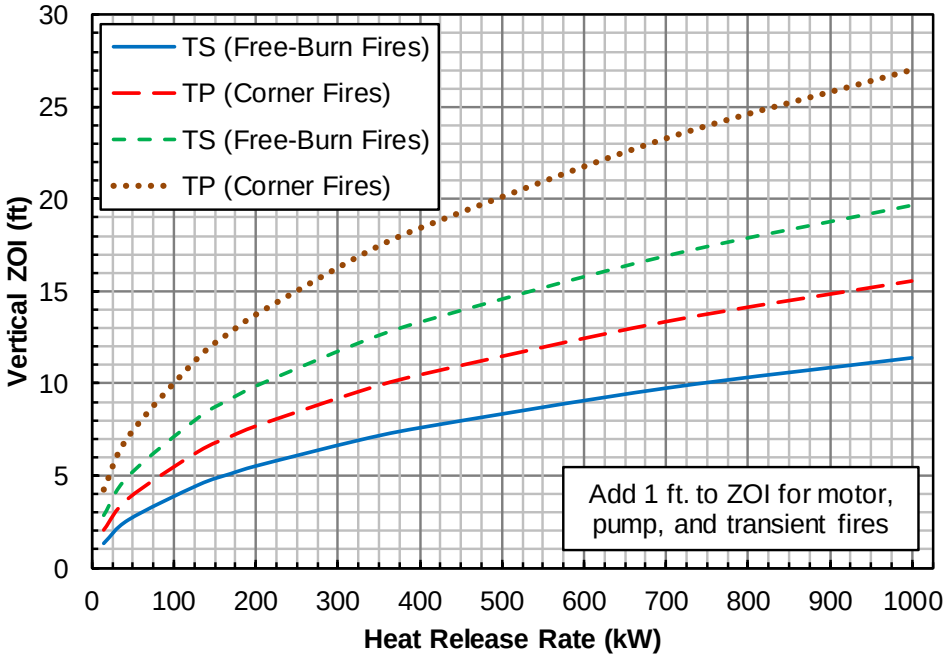

Figure A.01: Vertical ZOI vs. Fixed or Transient Ignition Source HRR
(Free-Burn & Corner Configurations, Thermoset & Thermoplastic Targets)

HRR (kW)	Radial ZOI (ft)		
	Thermoset	Thermoplastic	Electronics
15	0.6	0.8	1.2
45	1.0	1.4	2.0
130	1.7	2.4	3.5
170	2.0	2.8	3.9
200	2.1	3.0	4.3
325	2.7	3.8	5.5
400	3.0	4.2	6.1
700	4.0	5.6	8.0
1000	4.7	6.7	9.6
69	1.2	1.8	2.5
211	2.2	3.1	4.4
317	2.7	3.8	5.4

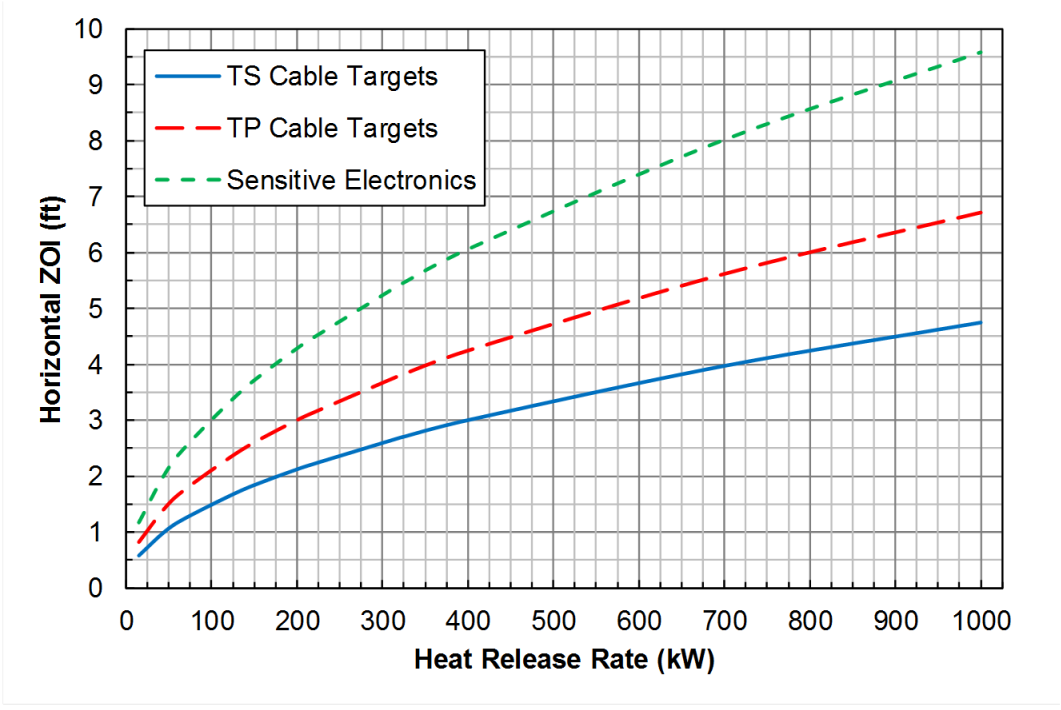

Figure A.02: Radial ZOI vs. Fixed or Transient Ignition Source HRR

D (ft.)	V_{limit} (gal)
3	0.3
4	0.6
5	1.0
6	1.4
7	1.9
8	2.5
9	3.1
10	3.9
11	4.7
12	5.6
13	6.5
14	7.6
15	8.7
16	9.9
17	11.2
18	12.5

D (ft.)	V_{limit} (gal)
19	13.9
20	15.4
21	17.0
22	18.7
23	20.4
24	22.2
25	24.1
26	26.1
27	28.1
28	30.3
29	32.5
30	34.7
31	37.1
32	39.5
33	42.0
34	44.6

D (ft.)	V_{limit} (gal)
35	47.3
36	50.0
37	52.9
38	55.7
39	58.7
40	61.8
41	64.9
42	68.1
43	71.4
44	74.7
45	78.2
46	81.7
47	85.3
48	88.9
49	92.7
50	96.5

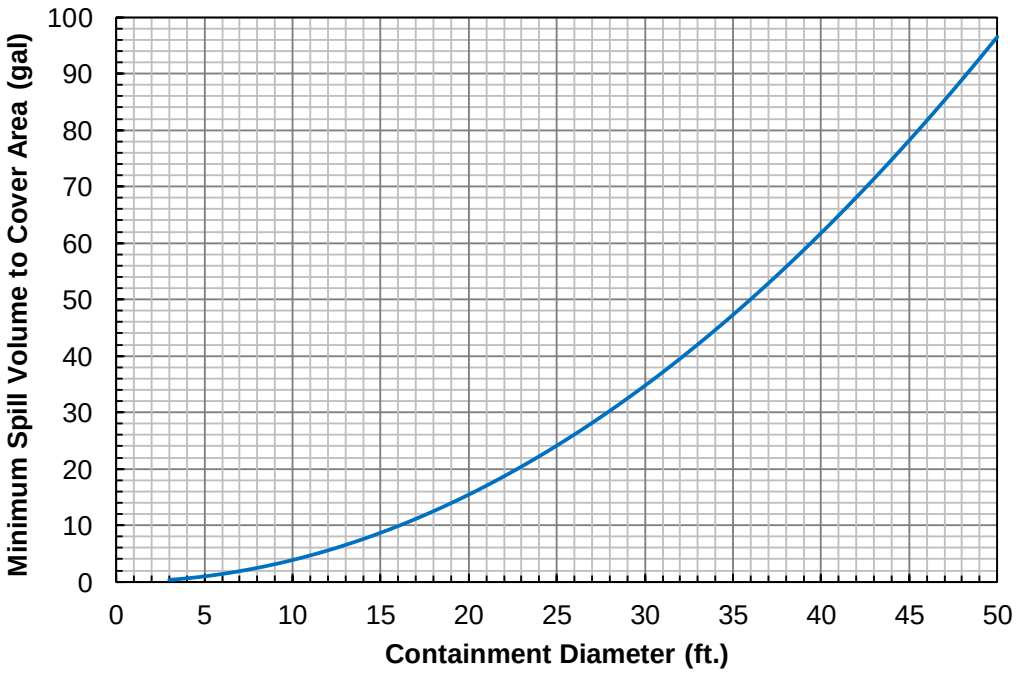

Figure A.03**:** Minimum Volume of a Liquid Fuel Spill to Cover a Specified Area

D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
		TS Target	TP Target
3.0	720	10.6	14.3
3.5	1039	12.2	16.5
4.0	1418	13.8	18.6
4.5	1854	15.3	20.7
5.0	2345	16.8	22.7
5.5	2890	18.2	24.6
6.0	3487	19.5	26.4
6.5	4136	20.8	28.2
7.0	4836	22.1	30.0
7.5	5586	23.3	31.7
8.0	6386	24.5	33.3
8.5	7236	25.7	34.9
9.0	8135	26.8	36.5
9.5	9083	27.9	38.1
10.0	10082	29.0	39.6

D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
		TS Target	TP Target
11	12227	31.1	42.6
12	14570	33.2	45.5
13	17114	35.2	48.3
14	19858	37.2	51.0
15	22802	39.1	53.7
16	25948	40.9	56.4
17	29296	42.8	59.0
18	32846	44.5	61.5
19	36598	46.3	64.0
20	40553	48.0	66.5
21	44710	49.7	68.9
22	49070	51.4	71.3
23	53633	53.1	73.7
24	58398	54.7	76.1
25	63366	56.3	78.4

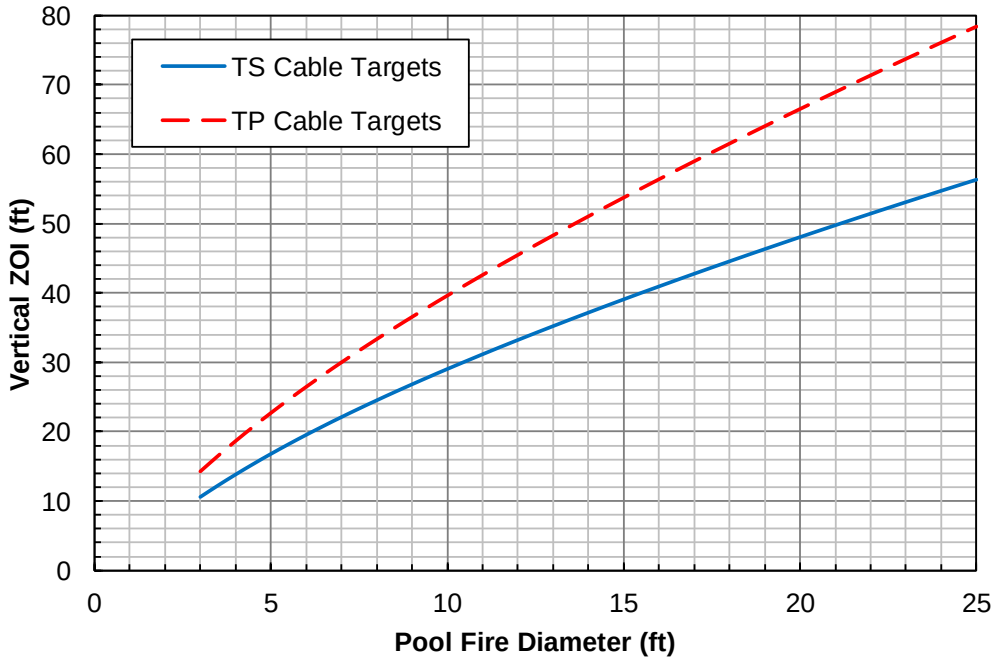

Figure A.04: Vertical ZOI of Confined Diesel Fuel and Fuel Oil Pool Fires

D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
		TS Target	TP Target
3.0	562	9.3	12.6
3.5	851	11.0	15.0
4.0	1213	12.7	17.3
4.5	1650	14.4	19.6
5.0	2165	16.1	21.8
5.5	2759	17.7	24.0
6.0	3432	19.4	26.2
6.5	4185	21.0	28.4
7.0	5017	22.5	30.5
7.5	5928	24.1	32.6
8.0	6917	25.6	34.7
8.5	7984	27.1	36.7
9.0	9128	28.5	38.7
9.5	10347	29.9	40.6
10.0	11640	31.3	42.5

D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
		TS Target	TP Target
11	14448	34.1	46.3
12	17544	36.7	49.9
13	20921	39.3	53.4
14	24574	41.7	56.8
15	28498	44.1	60.2
16	32689	46.5	63.4
17	37145	48.7	66.6
18	41862	51.0	69.6
19	46839	53.1	72.7
20	52075	55.2	75.6
21	57570	57.3	78.6
22	63322	59.4	81.4
23	69332	61.4	84.2
24	75600	63.3	87.0
25	82126	65.3	89.7

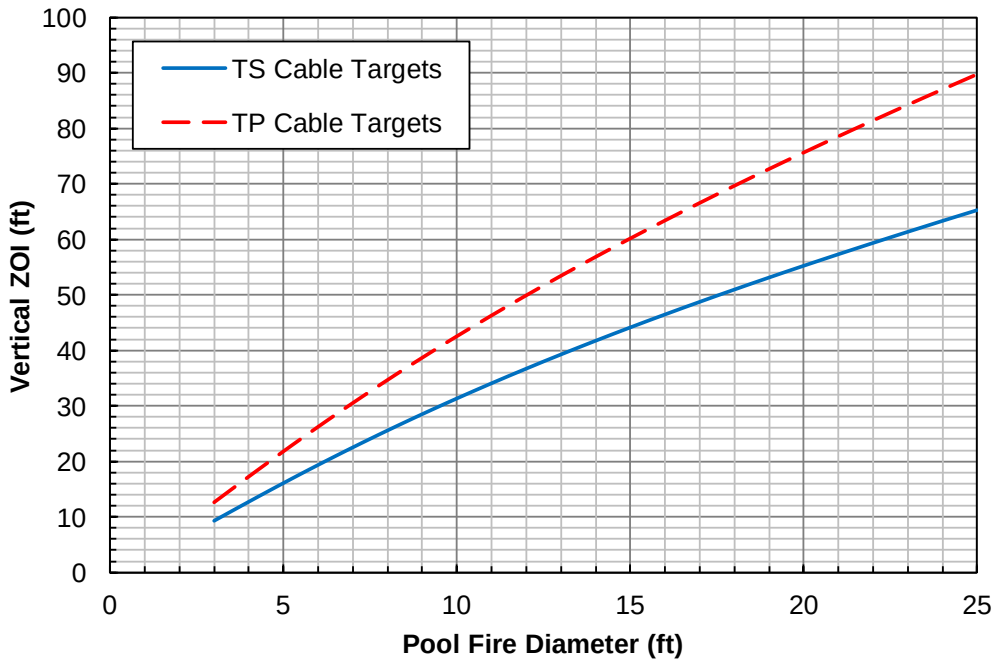

Figure A.05: Vertical ZOI of Confined Lube and Mineral Oil Pool Fires

D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
		TS Target	TP Target
3.0	55.3	1.8	3.1
3.5	82.4	2.2	3.7
4.0	116	2.5	4.3
4.5	155	2.8	4.8
5.0	200	3.1	5.3
5.5	252	3.4	5.8
6.0	310	3.6	6.2
6.5	373	3.9	6.7
7.0	443	4.1	7.1
7.5	518	4.3	7.5
8.0	599	4.5	7.9
8.5	685	4.7	8.3
9.0	777	4.9	8.7
9.5	874	5.1	9.0
10.0	977	5.2	9.4

D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
		TS Target	TP Target
11	1197	5.5	10.0
12	1438	5.8	10.6
13	1700	6.0	11.2
14	1981	6.2	11.7
15	2283	6.4	12.2
16	2604	6.5	12.7
17	2946	6.6	13.1
18	3308	6.8	13.5
19	3690	6.9	13.9
20	4091	6.9	14.3
21	4513	7.0	14.7
22	4956	7.1	15.0
23	5418	7.1	15.4
24	5901	7.2	15.7
25	6404	7.2	16.0

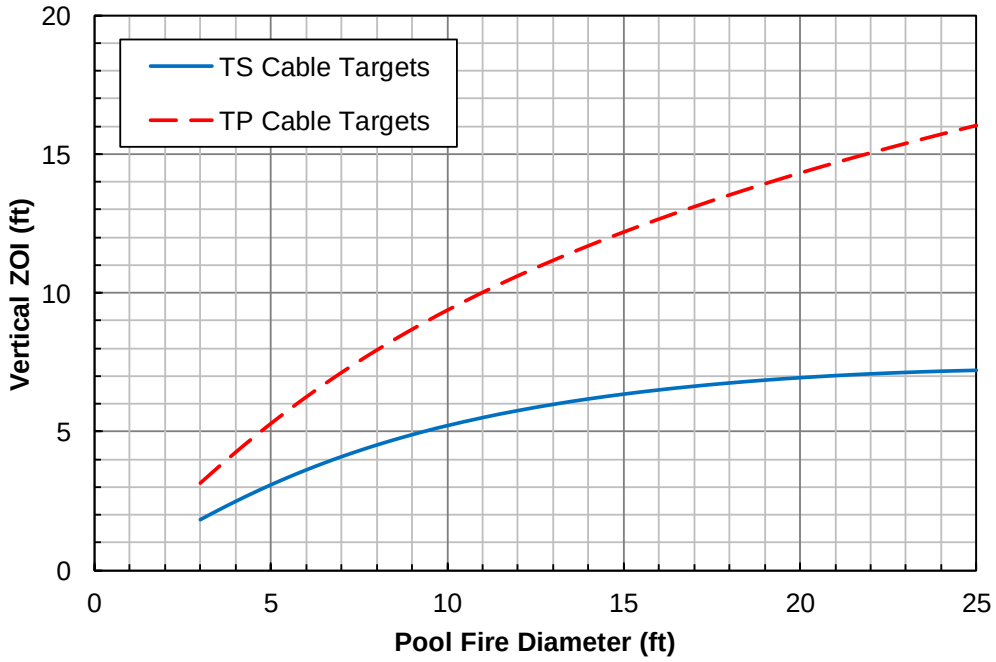

Figure A.06: Vertical ZOI of Confined Silicone Liquid Pool Fires

D (ft.)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
3.0	4.0	5.7	8.1
3.5	4.8	6.8	9.8
4.0	5.7	8.0	11.4
4.5	6.5	9.1	13.0
5.0	7.3	10.3	14.7
5.5	8.1	11.4	16.3
6.0	8.9	12.5	17.9
6.5	9.7	13.7	19.5
7.0	10.4	14.8	21.1
7.5	11.2	15.9	22.6
8.0	12.0	17.0	24.2
8.5	12.8	18.1	25.8
9.0	13.5	19.2	27.3
9.5	14.3	20.2	28.9
10.0	15.1	21.3	30.4

D (ft.)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
11	16.6	23.5	33.5
12	18.1	25.6	36.6
13	19.6	27.8	39.6
14	21.2	29.9	42.7
15	22.7	32.1	45.7
16	24.2	34.2	48.8
17	25.7	36.3	51.9
18	27.2	38.5	54.9
19	28.7	40.6	58.0
20	30.2	42.8	61.0
21	31.7	44.9	64.1
22	33.3	47.0	67.1
23	34.8	49.2	70.2
24	36.3	51.3	73.2
25	37.8	53.4	76.3

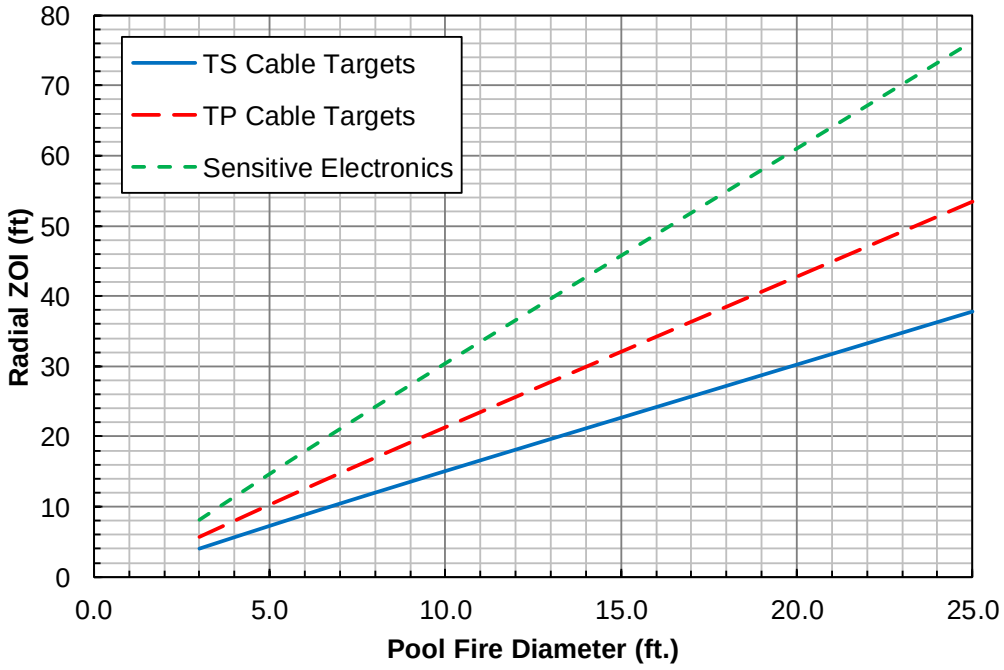

Figure A.07: Radial ZOI of Confined Diesel Fuel and Fuel Oil Pool Fires

D (ft.)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
3.0	3.6	5.0	7.2
3.5	4.4	6.2	8.8
4.0	5.2	7.4	10.5
4.5	6.1	8.6	12.3
5.0	7.0	9.9	14.1
5.5	7.9	11.2	15.9
6.0	8.8	12.4	17.7
6.5	9.7	13.7	19.6
7.0	10.6	15.0	21.5
7.5	11.6	16.3	23.3
8.0	12.5	17.7	25.2
8.5	13.4	19.0	27.1
9.0	14.3	20.3	28.9
9.5	15.3	21.6	30.8
10.0	16.2	22.9	32.7

D (ft.)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
11	18.0	25.5	36.4
12	19.9	28.1	40.1
13	21.7	30.7	43.8
14	23.5	33.3	47.5
15	25.3	35.8	51.1
16	27.1	38.4	54.8
17	28.9	40.9	58.4
18	30.7	43.4	62.0
19	32.5	46.0	65.6
20	34.3	48.5	69.1
21	36.0	50.9	72.7
22	37.8	53.4	76.2
23	39.5	55.9	79.8
24	41.3	58.4	83.3
25	43.0	60.8	86.8

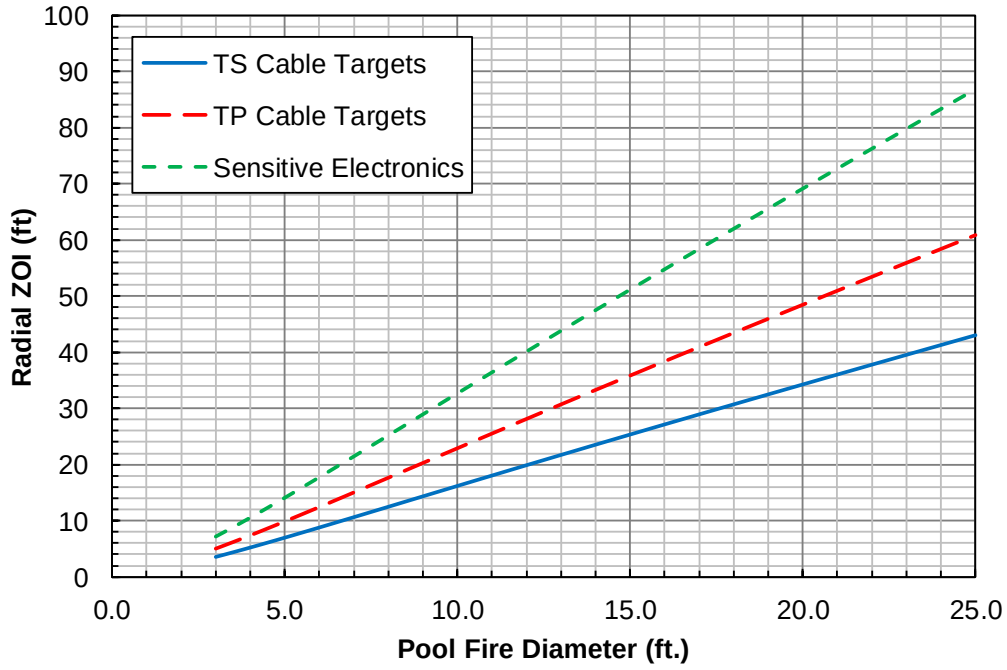

Figure A.08: Radial ZOI of Confined Lube and Mineral Oil Pool Fires

D (ft.)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
3.0	2.5	2.5	2.5
3.5	2.8	2.8	2.8
4.0	3.0	3.0	3.3
4.5	3.3	3.3	3.8
5.0	3.5	3.5	4.3
5.5	3.8	3.8	4.8
6.0	4.0	4.0	5.3
6.5	4.3	4.3	5.9
7.0	4.5	4.5	6.4
7.5	4.8	4.8	6.9
8.0	5.0	5.2	7.4
8.5	5.3	5.6	7.9
9.0	5.5	5.9	8.4
9.5	5.8	6.3	9.0
10.0	6.0	6.6	9.5

D (ft.)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
11	6.5	7.3	10.5
12	7.0	8.1	11.5
13	7.5	8.8	12.5
14	8.0	9.5	13.5
15	8.5	10.1	14.5
16	9.0	10.8	15.5
17	9.5	11.5	16.4
18	10.0	12.2	17.4
19	10.5	12.9	18.4
20	11.0	13.6	19.4
21	11.5	14.3	20.4
22	12.0	14.9	21.3
23	12.5	15.6	22.3
24	13.0	16.3	23.3
25	13.5	17.0	24.2

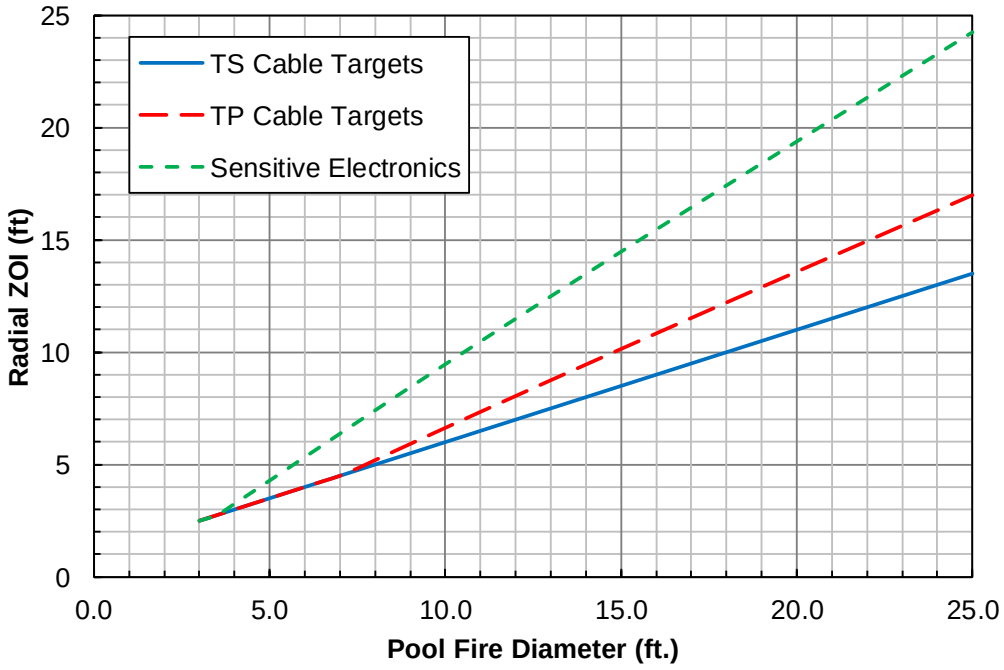

Figure A.09: Radial ZOI of Confined Silicone Liquid Pool Fires

V (gal)	D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
			TS Target	TP Target
1	5.1	2438	17.0	23.0
2	7.2	5126	22.6	30.7
3	8.8	7797	26.4	35.9
4	10.2	10451	29.4	40.1
5	11.4	13095	31.9	43.7
6	12.5	15732	34.1	46.8
7	13.5	18366	36.1	49.6
8	14.4	20997	37.9	52.1
9	15.3	23627	39.6	54.4
10	16.1	26255	41.1	56.6
11	16.9	28883	42.5	58.7
12	17.5	31143	43.7	60.3
13	18.1	33059	44.6	61.7
14	18.6	34950	45.5	62.9
15	19.1	36820	46.4	64.2

V (gal)	D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
			TS Target	TP Target
16	19.5	38668	47.2	65.3
17	20.0	40498	48.0	66.5
18	20.4	42310	48.8	67.5
19	20.9	44106	49.5	68.6
20	21.3	45886	50.2	69.6
21	21.7	47653	50.9	70.6
22	22.1	49406	51.5	71.5
23	22.5	51146	52.2	72.4
24	22.8	52874	52.8	73.3
25	23.2	54591	53.4	74.2
26	23.6	56298	54.0	75.0
27	23.9	57994	54.6	75.9
28	24.3	59680	55.1	76.7
29	24.6	61357	55.7	77.5
30	24.9	63026	56.2	78.2

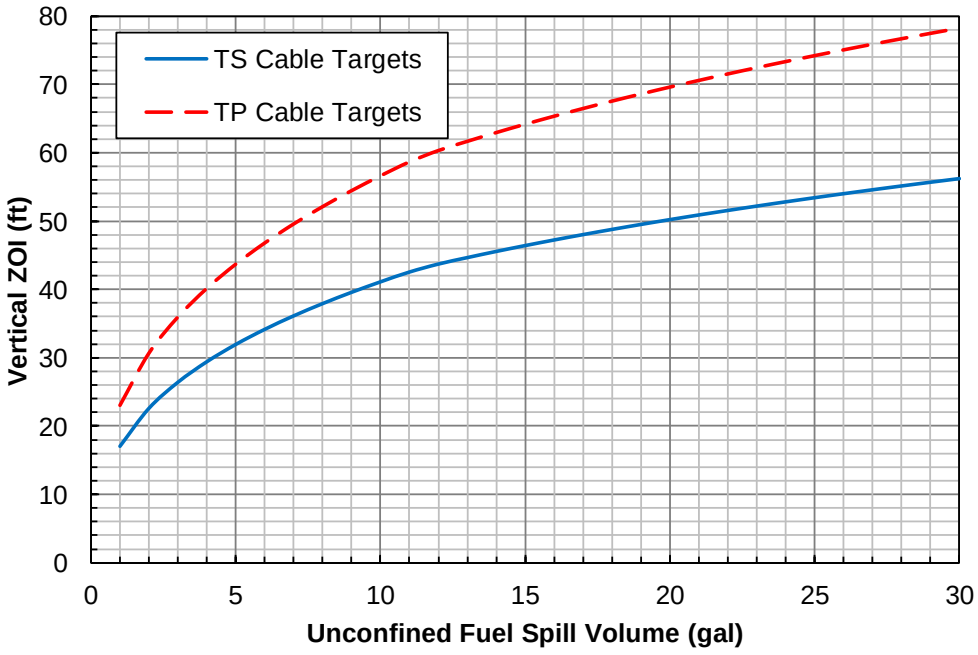

Figure A.10: Vertical ZOI of Unconfined Diesel Fuel and Fuel Oil Spill Fires

V (gal)	D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
			TS Target	TP Target
1	5.1	2265	16.4	22.2
2	7.2	5368	23.1	31.4
3	8.8	8696	28.0	37.9
4	10.2	12121	31.8	43.2
5	11.4	15592	35.1	47.7
6	12.5	19085	37.9	51.6
7	13.5	22588	40.4	55.0
8	14.4	26093	42.7	58.2
9	15.3	29597	44.8	61.0
10	16.1	33098	46.7	63.7
11	16.9	36595	48.5	66.2
12	17.5	39599	49.9	68.2
13	18.1	42144	51.1	69.8
14	18.6	44654	52.2	71.4
15	19.1	47132	53.2	72.8

V (gal)	D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
			TS Target	TP Target
16	19.5	49580	54.2	74.3
17	20.0	52002	55.2	75.6
18	20.4	54398	56.1	76.9
19	20.9	56771	57.0	78.1
20	21.3	59122	57.9	79.3
21	21.7	61453	58.7	80.5
22	22.1	63764	59.5	81.6
23	22.5	66057	60.3	82.7
24	22.8	68334	61.0	83.8
25	23.2	70594	61.8	84.8
26	23.6	72838	62.5	85.8
27	23.9	75069	63.2	86.8
28	24.3	77285	63.8	87.7
29	24.6	79488	64.5	88.6
30	24.9	81679	65.1	89.6

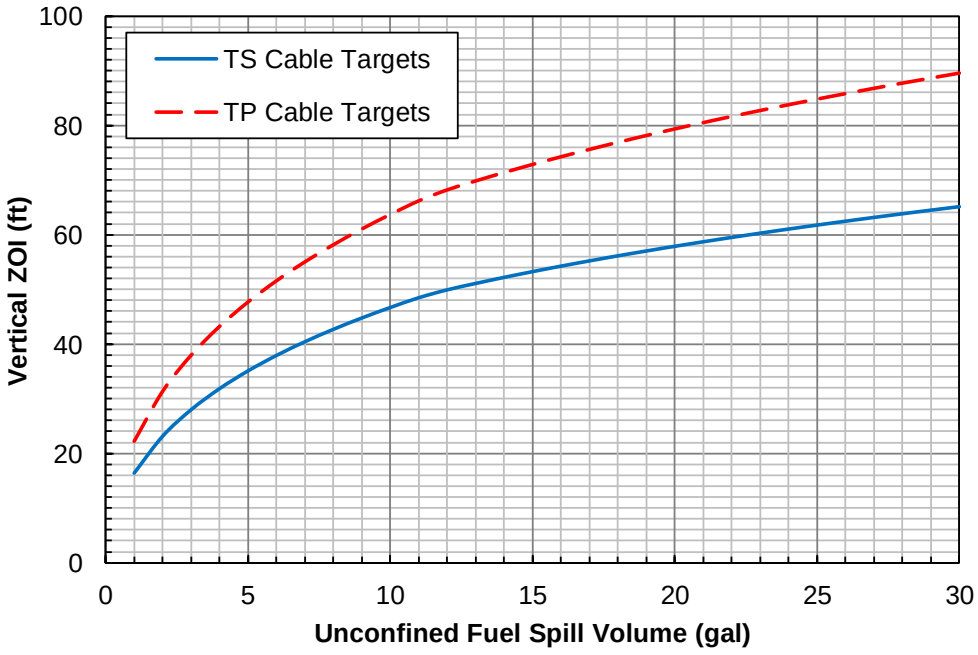

Figure A.11: Vertical ZOI of Unconfined Lube and Mineral Oil Spill Fires

V (gal)	D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
			TS Target	TP Target
1	5.1	209	3.1	5.4
2	7.2	472	4.2	7.3
3	8.8	742	4.8	8.5
4	10.2	1014	5.3	9.5
5	11.4	1286	5.6	10.2
6	12.5	1558	5.9	10.9
7	13.5	1828	6.1	11.4
8	14.4	2098	6.2	11.9
9	15.3	2367	6.4	12.3
10	16.1	2636	6.5	12.7
11	16.9	2904	6.6	13.1
12	17.5	3134	6.7	13.3
13	18.1	3329	6.8	13.6
14	18.6	3522	6.8	13.8
15	19.1	3712	6.9	14.0

V (gal)	D (ft.)	HRR (kW)	Vertical ZOI (ft.)	
			TS Target	TP Target
16	19.5	3900	6.9	14.1
17	20.0	4086	6.9	14.3
18	20.4	4270	7.0	14.5
19	20.9	4452	7.0	14.6
20	21.3	4633	7.0	14.8
21	21.7	4812	7.1	14.9
22	22.1	4990	7.1	15.1
23	22.5	5166	7.1	15.2
24	22.8	5341	7.1	15.3
25	23.2	5515	7.1	15.5
26	23.6	5688	7.2	15.6
27	23.9	5860	7.2	15.7
28	24.3	6031	7.2	15.8
29	24.6	6201	7.2	15.9
30	24.9	6370	7.2	16.0

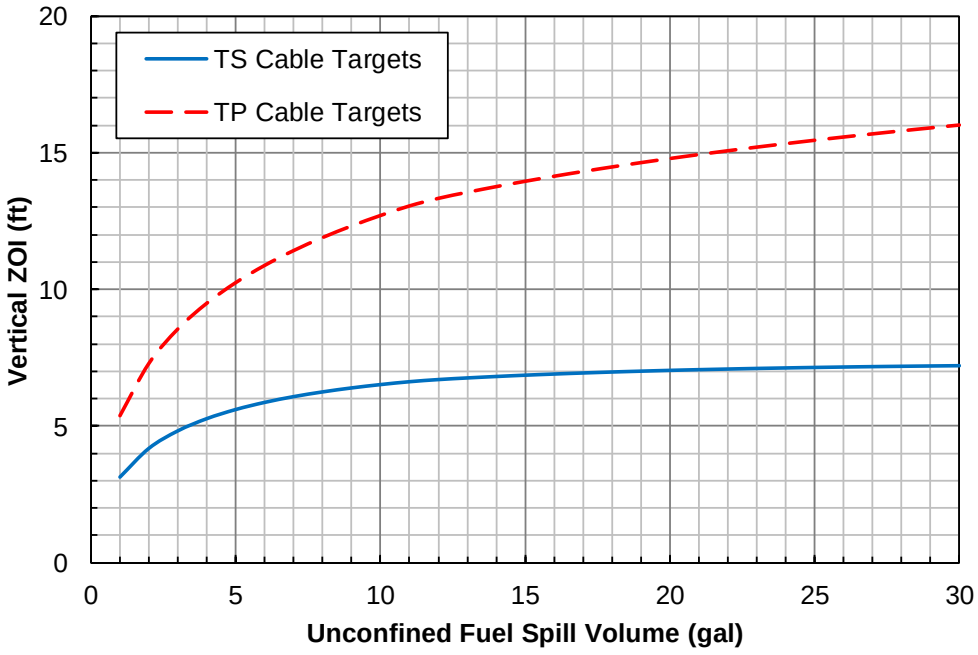

Figure A.12: Vertical ZOI of Unconfined Silicone Liquid Spill Fires

V (gal)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
1	7.4	10.5	15.0
2	10.7	15.2	21.7
3	13.3	18.7	26.7
4	15.3	21.7	31.0
5	17.2	24.3	34.7
6	18.8	26.6	38.0
7	20.3	28.8	41.1
8	21.8	30.8	43.9
9	23.1	32.6	46.6
10	24.3	34.4	49.1
11	25.5	36.1	51.5
12	26.5	37.5	53.5
13	27.3	38.6	55.1
14	28.1	39.7	56.6
15	28.8	40.7	58.1

V (gal)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
16	29.5	41.8	59.6
17	30.2	42.7	61.0
18	30.9	43.7	62.3
19	31.5	44.6	63.6
20	32.2	45.5	64.9
21	32.8	46.3	66.1
22	33.4	47.2	67.3
23	34.0	48.0	68.5
24	34.5	48.8	69.7
25	35.1	49.6	70.8
26	35.6	50.4	71.9
27	36.2	51.1	73.0
28	36.7	51.9	74.0
29	37.2	52.6	75.0
30	37.7	53.3	76.1

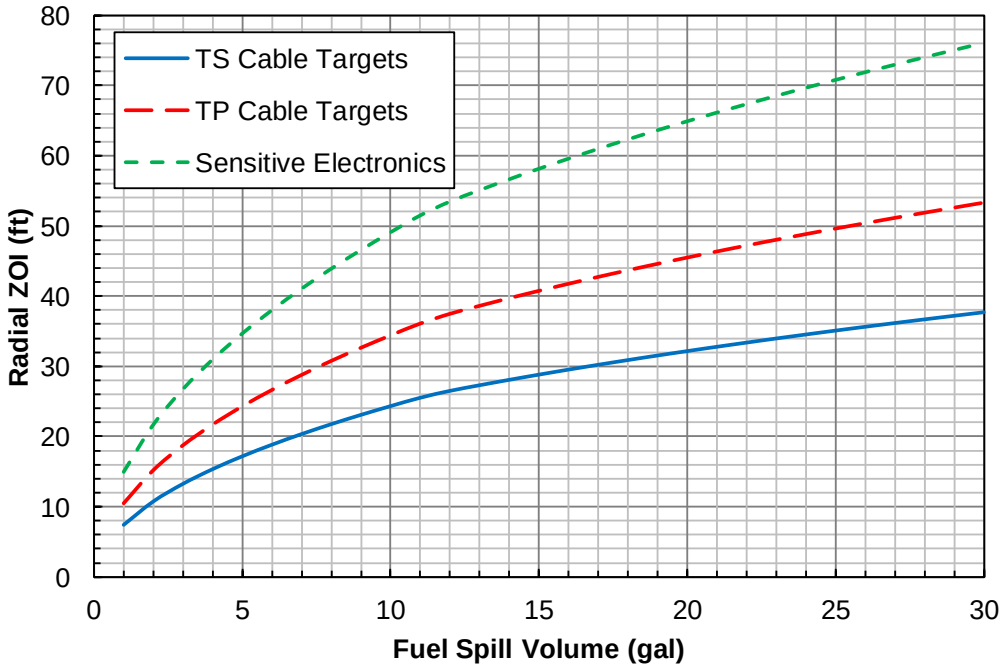

Figure A.13: Radial ZOI of Unconfined Diesel Fuel and Fuel Oil Spill Fires

V (gal)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
1	7.1	10.1	14.4
2	11.0	15.6	22.2
3	14.0	19.8	28.3
4	16.5	23.4	33.4
5	18.7	26.5	37.8
6	20.7	29.3	41.9
7	22.6	31.9	45.5
8	24.3	34.3	48.9
9	25.8	36.5	52.1
10	27.3	38.6	55.1
11	28.7	40.6	58.0
12	29.9	42.3	60.3
13	30.8	43.6	62.2
14	31.7	44.9	64.0
15	32.6	46.1	65.8

V (gal)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
16	33.4	47.3	67.5
17	34.2	48.4	69.1
18	35.0	49.5	70.7
19	35.8	50.6	72.2
20	36.5	51.6	73.7
21	37.2	52.6	75.1
22	37.9	53.6	76.5
23	38.6	54.6	77.9
24	39.2	55.5	79.2
25	39.9	56.4	80.5
26	40.5	57.3	81.8
27	41.1	58.2	83.0
28	41.7	59.0	84.2
29	42.3	59.9	85.4
30	42.9	60.7	86.6

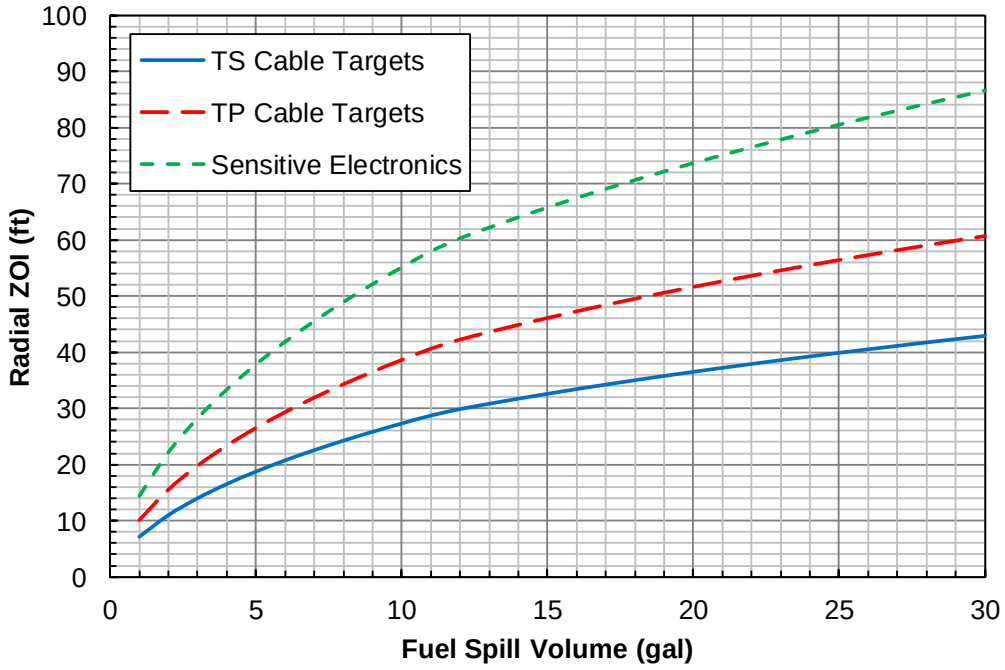

Figure A.14: Radial ZOI of Unconfined Lube and Mineral Oil Spill Fires

V (gal)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
1	3.5	3.5	4.4
2	4.6	4.6	6.6
3	5.4	5.8	8.3
4	6.1	6.8	9.6
5	6.7	7.6	10.9
6	7.2	8.4	12.0
7	7.7	9.1	13.0
8	8.2	9.7	13.9
9	8.6	10.3	14.7
10	9.0	10.9	15.6
11	9.4	11.4	16.3
12	9.8	11.9	17.0
13	10.0	12.3	17.5
14	10.3	12.6	18.0
15	10.5	12.9	18.5

V (gal)	Radial ZOI (ft.)		
	TS Target	TP Target	SE Target
16	10.8	13.3	18.9
17	11.0	13.6	19.4
18	11.2	13.9	19.8
19	11.4	14.2	20.2
20	11.6	14.5	20.6
21	11.8	14.7	21.0
22	12.0	15.0	21.4
23	12.2	15.3	21.8
24	12.4	15.5	22.1
25	12.6	15.8	22.5
26	12.8	16.0	22.8
27	13.0	16.3	23.2
28	13.1	16.5	23.5
29	13.3	16.7	23.9
30	13.5	16.9	24.2

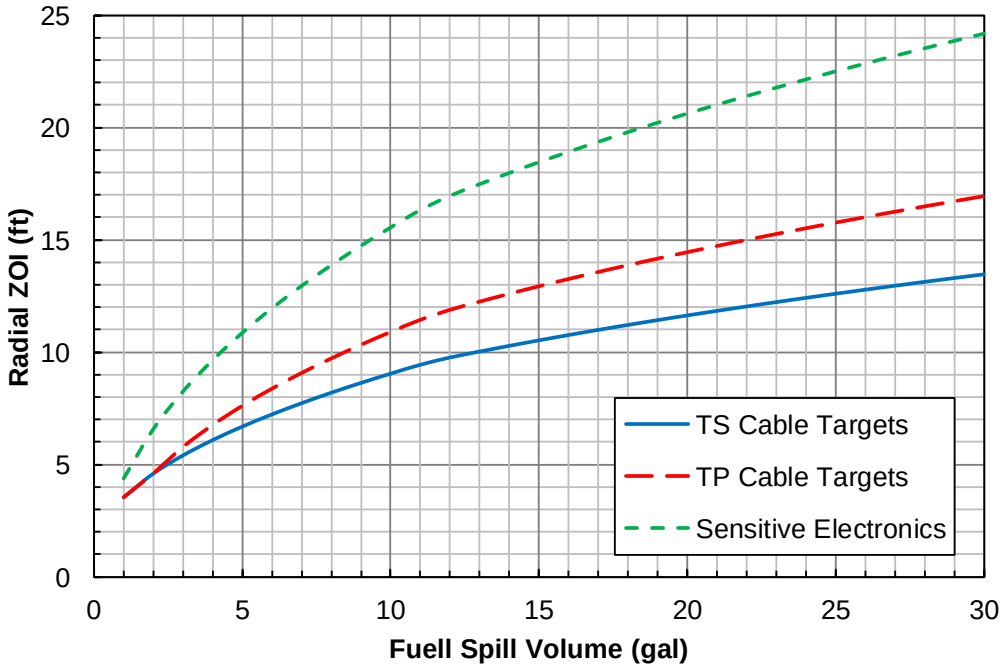

Figure A.15: Radial ZOI of Unconfined Silicone Liquid Spill Fires

Appendix B. HOT GAS LAYER TABLES AND GRAPHS

TABLE OF CONTENTS

Set B: Overview and Assumptions

Table/plot set B provides the minimum HRR that is needed to create damaging HGL conditions for a range of compartment sizes and different target types. It is used to screen ignition sources that are not capable of generating a damaging HGL (Step 2.3.3), and to identify scenarios involving secondary combustibles that can cause development of a damaging HGL in the fire area (Step 2.5.2).

The assumptions and background for the calculations performed to develop the tables and plots in set B are discussed in Section 06.03.02 of IMC 0308, Attachment 3, Appendix F. The principal assumptions are as follows:

a. An important assumption is that the compartment has openings that are large enough to allow sufficient ventilation to support the fire, which justifies the use of the method of McCaffrey, Quintiere, and Harkleroad to calculate the HGL temperature over the methods for closed and mechanically-vented compartments that are described in Chapter 2 of NUREG-1805. In addition, the opening is assumed to be a standard 3 ft. wide, 7 ft. high open doorway. Several plants transitioning to NFPA 805 made the same assumptions, and the NRC review of the LAR submitted by these plants concluded that these assumptions and the exclusive use of the MQH method are acceptable.
b. The ambient air temperature, T_a, is assumed to be 77°F.
c. The minimum HRR to create damaging HGL conditions was calculated for floor areas ranging from 100 to 4900 ft^2, and ceiling heights between 10 and 30 ft. It is unlikely that a HGL can develop in a compartment with a floor area and ceiling height outside the upper limit of those ranges.
d. The compartment boundaries (floor, walls, and ceiling) are assumed to be constructed of concrete with thermal properties taken from Table 2-3 in NUREG-1805, and a thickness of 1 ft.
e. The heat transfer coefficient, h_T, (see Equation 14 in Section 06.03.02 of IMC 0308, Attachment 3, Appendix F) is calculated at t = 1800 s. This is conservative because, for 1 ft.-thick concrete boundaries, h_T decreases as a function of time, and the minimum HRR to cause a damaging HGL is usually reached before 30 minutes have elapsed.

Floor Area (ft^2)	Minimum HRR to Create Damaging Hot Gas Layer Conditions (kW)				
	H = 10 ft.	H = 15 ft.	H = 20 ft.	H = 25 ft.	H = 30 ft.
100	734	851	954	1047	1132
400	1212	1356	1487	1607	1719
700	1505	1661	1803	1934	2058
1000	1737	1898	2047	2186	2317
1300	1934	2100	2254	2398	2534
1600	2108	2277	2435	2583	2724
1900	2266	2438	2599	2751	2894
2200	2412	2586	2750	2904	3050
2500	2547	2724	2889	3046	3195
2800	2675	2853	3020	3179	3330
3100	2796	2975	3144	3305	3458
3400	2910	3091	3262	3424	3579
3700	3020	3202	3374	3538	3694
4000	3126	3308	3482	3647	3804
4300	3227	3411	3585	3751	3910
4600	3325	3510	3685	3852	4013
4900	3420	3605	3781	3950	4111

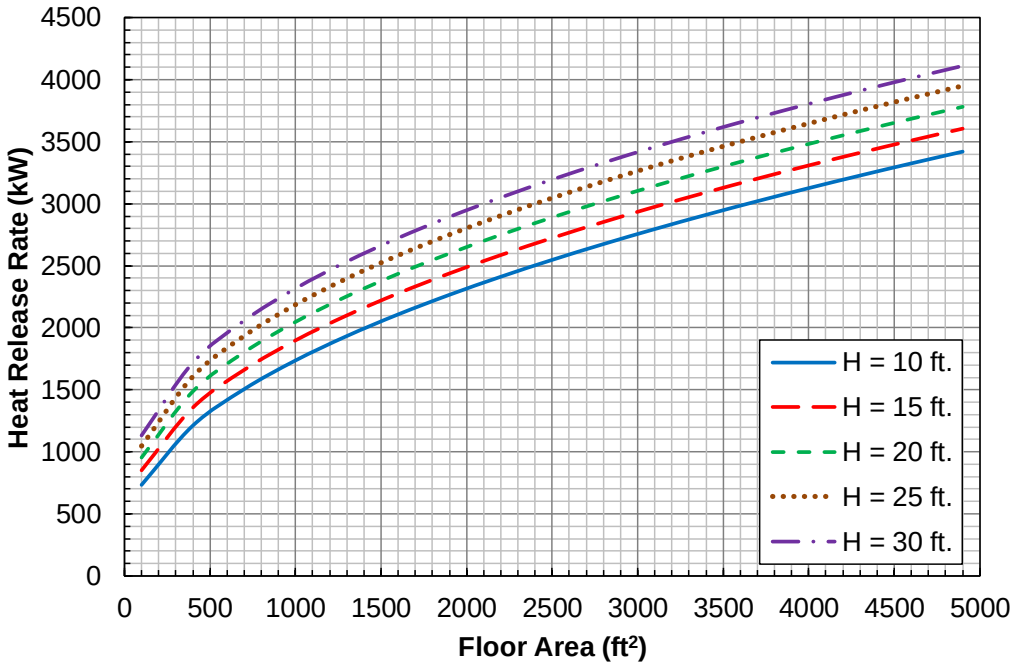

Figure B.01: Minimum HRR to Create a Damaging HGL (TS Targets)

Floor Area (ft^2)	Minimum HRR to Create Damaging Hot Gas Layer Conditions (kW)				
	H = 10 ft.	H = 15 ft.	H = 20 ft.	H = 25 ft.	H = 30 ft.
100	332	385	432	474	512
400	548	614	673	727	778
700	681	751	816	875	931
1000	786	859	926	989	1048
1300	875	950	1020	1085	1147
1600	954	1031	1102	1169	1232
1900	1025	1103	1176	1245	1310
2200	1091	1170	1244	1314	1380
2500	1153	1232	1307	1378	1446
2800	1210	1291	1367	1439	1507
3100	1265	1346	1423	1495	1565
3400	1317	1399	1476	1549	1619
3700	1367	1449	1527	1601	1672
4000	1414	1497	1576	1650	1722
4300	1460	1543	1622	1698	1770
4600	1505	1588	1667	1743	1816
4900	1547	1631	1711	1787	1860

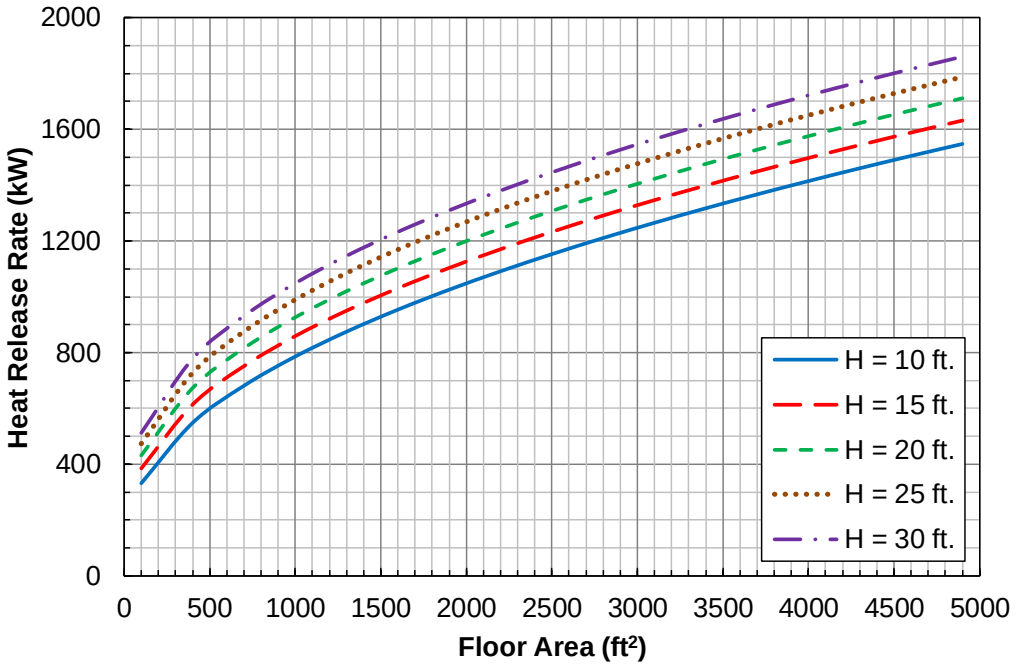

Figure B.02: Minimum HRR to Create a Damaging HGL (TP Targets)

Floor Area (ft^2)	Minimum HRR to Create Damaging Hot Gas Layer Conditions (kW)				
	H = 10 ft.	H = 15 ft.	H = 20 ft.	H = 25 ft.	H = 30 ft.
100	36	41	46	51	55
400	59	66	72	78	84
700	73	81	88	94	100
1000	84	92	100	106	113
1300	94	102	110	117	123
1600	102	111	118	126	132
1900	110	119	126	134	141
2200	117	126	134	141	148
2500	124	132	140	148	155
2800	130	139	147	155	162
3100	136	145	153	161	168
3400	142	150	159	166	174
3700	147	156	164	172	180
4000	152	161	169	177	185
4300	157	166	174	182	190
4600	162	171	179	187	195
4900	166	175	184	192	200

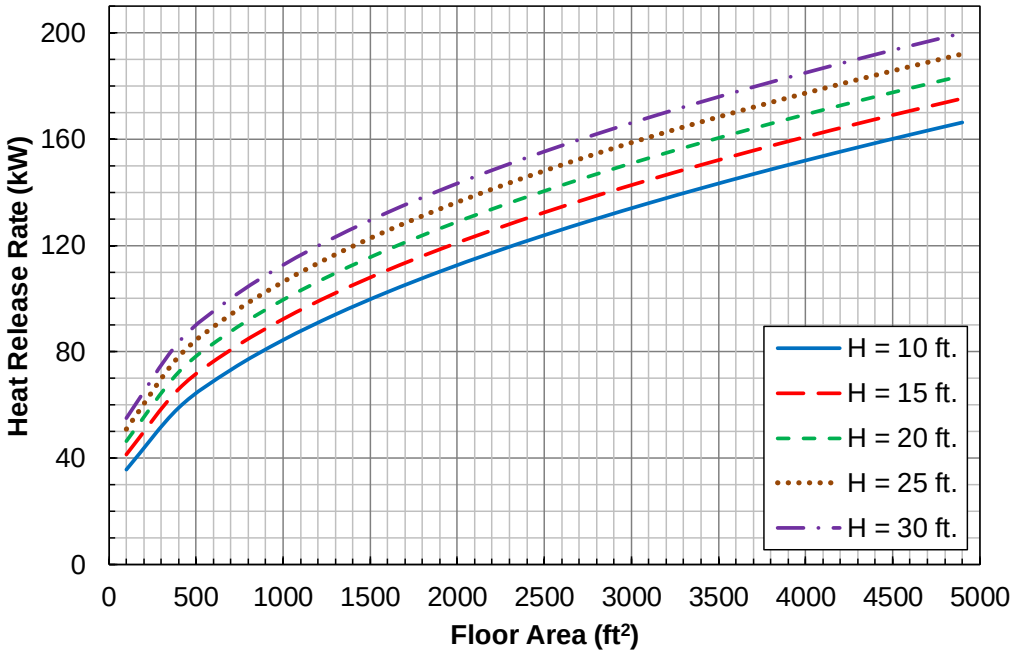

Figure B.03: Minimum HRR to Create a Damaging HGL (SE Targets)

Appendix C. HEAT RELEASE RATE PROFILES OF FIRES INVOLVING HORIZONTAL CABLE TRAYS

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Set C: Overview and Assumptions

Table/plot set C provides the combined HRR of an ignition source and a vertical stack of between one and seven horizontal cable trays as a function of time for various ignition source-cable tray configurations. This set is used in conjunction with table/plot set B to determine if and when a fire scenario involving secondary combustibles will cause a damaging HGL in the fire area (Step 2.5.2).

The assumptions and background for the calculations performed to develop the tables and plots in set C are discussed in Section 06.03.03 of IMC 0308, Attachment 3, Appendix F. The principal assumptions are as follows:

a. The FLASH-CAT model was used to calculate the HRR of vertical stacks of horizontal cable trays. The model is described in Chapter 9 of NUREG/CR-7010, Vol. 1, and in Section 06.03.03 of IMC 0308, Attachment 3, Appendix F.
b. The HRR as a function of time for an ignition source in combination with a vertical stack of cable trays was calculated at 1 minute intervals for the following ignition source-cable tray configurations:
    1. Ignition source-cable tray HRR tables and plots were developed for all fixed and transient ignition sources listed in Table A5.1 of Attachment 5.
    2. In addition, HRR tables and plots were developed for cable tray fires without an ignition source. These tables and plots can be used to determine the HRR of cable trays fires that are ignited by a confined liquid fuel pool fire or an unconfined liquid fuel spill fire by adding the HRR of the confined liquid fuel pool fire or unconfined liquid fuel spill fire. The HRRs of confined liquid fuel pool fires and unconfined liquid fuel spill fires are tabulated in table/plot set A.
    3. HRR tables and plots were developed for cable trays widths of 1.5 and 3 ft. The calculated HRR values for 1.5 ft. wide trays can be used for 1 ft. and 2 ft. wide trays. The calculated HRR values for 3.0 ft. wide trays can be used for single trays and multiple trays side-by-side with a total width greater than 2 ft.
    4. The trays were assumed to be 24 ft. long and ignited at the center to ensure that it would take at least one hour for the flame to spread to the end of the trays.
    5. The assumed spacing between trays was 1 ft.
    6. HRR tables and plots were developed for stacks of one through seven trays filled with TS and TP cables. The HRR tables and plots for TS cables can also be used for Kerite cables.
c. The table/plot set C HRRs for TS cables were calculated assuming 75% of the trays are filled with cables that have the characteristics of cable #16 in NUREG/CR-7010, Vol. 1. This cable was chosen because, of all the TS cables that were tested, it results in the highest amount of active polymer in the trays. The tables and plots for TP cables were developed in the assumption that 75% of the trays are filled with cables that have the characteristics of cable #701 in NUREG/CR-7010, Vol. 1, which was the only true TP cable that was tested. The input parameters for the cable tray fire propagation model calculations are given in Section 06.03.03 of IMC 0308, Attachment 3, Appendix F (see Table 6.2.10).

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3	3	3	3	3	3	3	13	13	13	13	13	13	13
3	6	6	6	6	6	6	6	29	29	29	29	29	29	29
4	9	9	9	9	9	9	9	48	48	48	48	48	48	48
5	13	13	13	13	13	13	13	69	69	69	69	69	69	69
6	16	22	22	22	22	22	22	90	114	114	114	114	114	114
7	20	31	31	31	31	31	31	102	152	152	152	152	152	152
8	24	41	41	41	41	41	41	115	194	194	194	194	194	194
9	29	51	58	58	58	58	58	127	238	272	272	272	272	272
10	33	61	77	77	77	77	77	139	278	349	349	349	349	349
11	38	72	96	106	106	106	106	152	303	413	457	457	457	457
12	43	84	115	135	148	148	148	164	327	479	571	625	625	625
13	48	95	135	166	191	205	205	176	352	540	681	793	858	858
14	51	106	154	195	233	263	280	189	377	577	770	942	1074	1149
15	54	115	173	224	275	320	354	201	402	614	850	1084	1287	1440
16	56	125	191	254	318	378	429	213	426	651	899	1185	1460	1694
17	59	135	210	284	361	437	506	226	451	688	949	1246	1580	1897
18	61	142	227	312	403	494	581	238	476	725	998	1308	1654	2037
19	64	147	241	338	442	549	655	250	500	762	1048	1370	1728	2123
20	66	152	256	365	483	606	729	263	525	799	1097	1431	1802	2210
21	69	157	266	387	519	659	801	275	550	836	1146	1493	1876	2296
22	71	162	274	407	553	709	870	287	574	873	1196	1555	1951	2383
23	74	166	281	420	581	754	933	300	599	910	1245	1617	2025	2469
24	76	171	289	430	599	788	987	312	624	947	1294	1678	2099	2555
25	78	176	296	440	611	809	1026	320	644	980	1340	1736	2169	2638
26	81	181	303	450	623	823	1050	318	655	1003	1375	1783	2228	2710
27	83	186	311	460	636	838	1068	314	662	1023	1407	1828	2286	2779
28	86	191	318	470	648	853	1085	307	668	1040	1437	1870	2340	2846
29	88	196	326	480	660	868	1102	297	663	1048	1457	1902	2384	2903
30	91	201	333	489	673	883	1120	292	646	1043	1465	1923	2417	2948
31	93	206	340	499	685	898	1137	292	631	1041	1474	1945	2451	2995
32	96	211	348	509	697	912	1154	292	613	1024	1471	1953	2472	3028
33	98	216	355	519	710	927	1171	292	593	982	1440	1935	2467	3035
34	101	221	363	529	722	942	1189	292	584	948	1404	1912	2455	3036
35	103	226	370	539	734	957	1206	292	584	920	1344	1846	2402	2994
36	106	231	378	549	747	972	1223	292	584	890	1278	1736	2284	2889
37	108	236	385	559	759	986	1241	292	584	877	1227	1640	2133	2726
38	111	241	392	569	771	1001	1258	292	584	877	1186	1550	1988	2517
39	113	245	400	578	784	1016	1275	292	584	877	1169	1482	1861	2324
40	115	250	407	588	796	1031	1292	292	584	877	1169	1461	1779	2172

Figure C.01.a: Table of HRRs of 1.5 ft. Cable Tray Fires

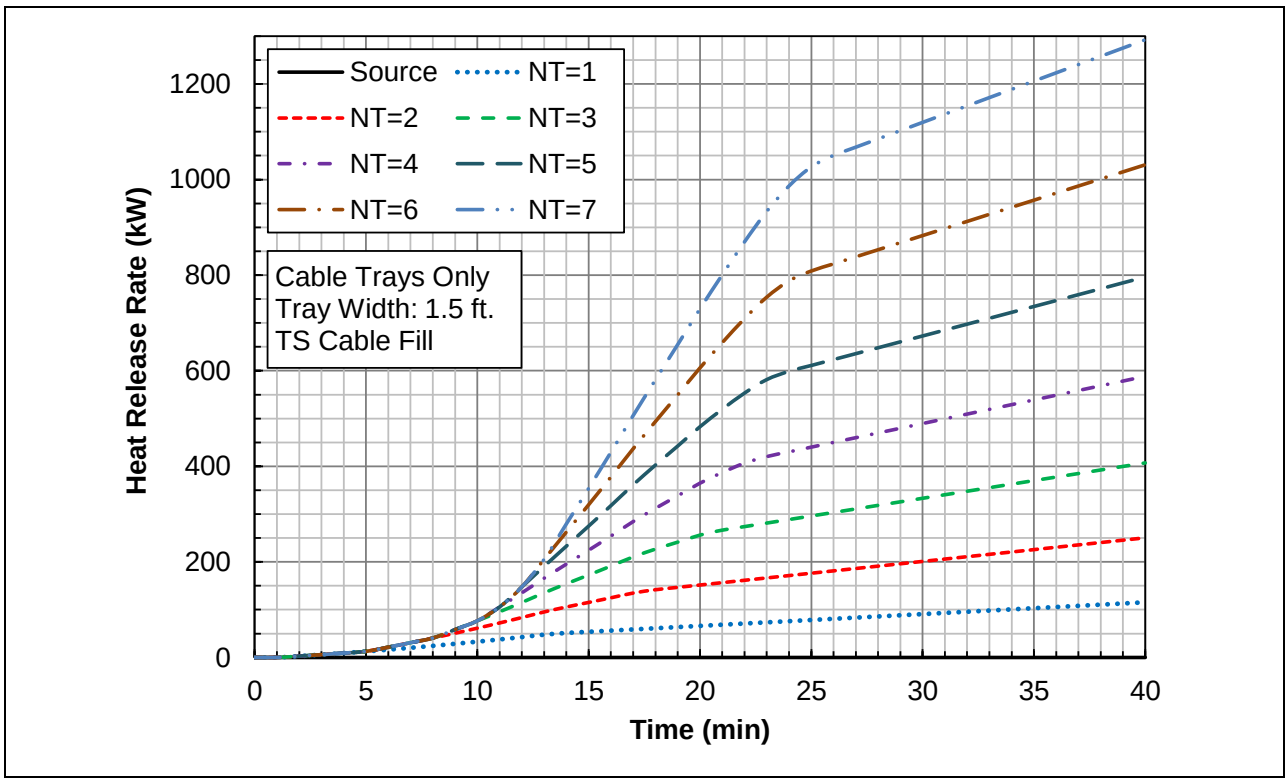

Figure C.01.b: HRR Plots of 1.5 ft. TS Cable Tray Fires

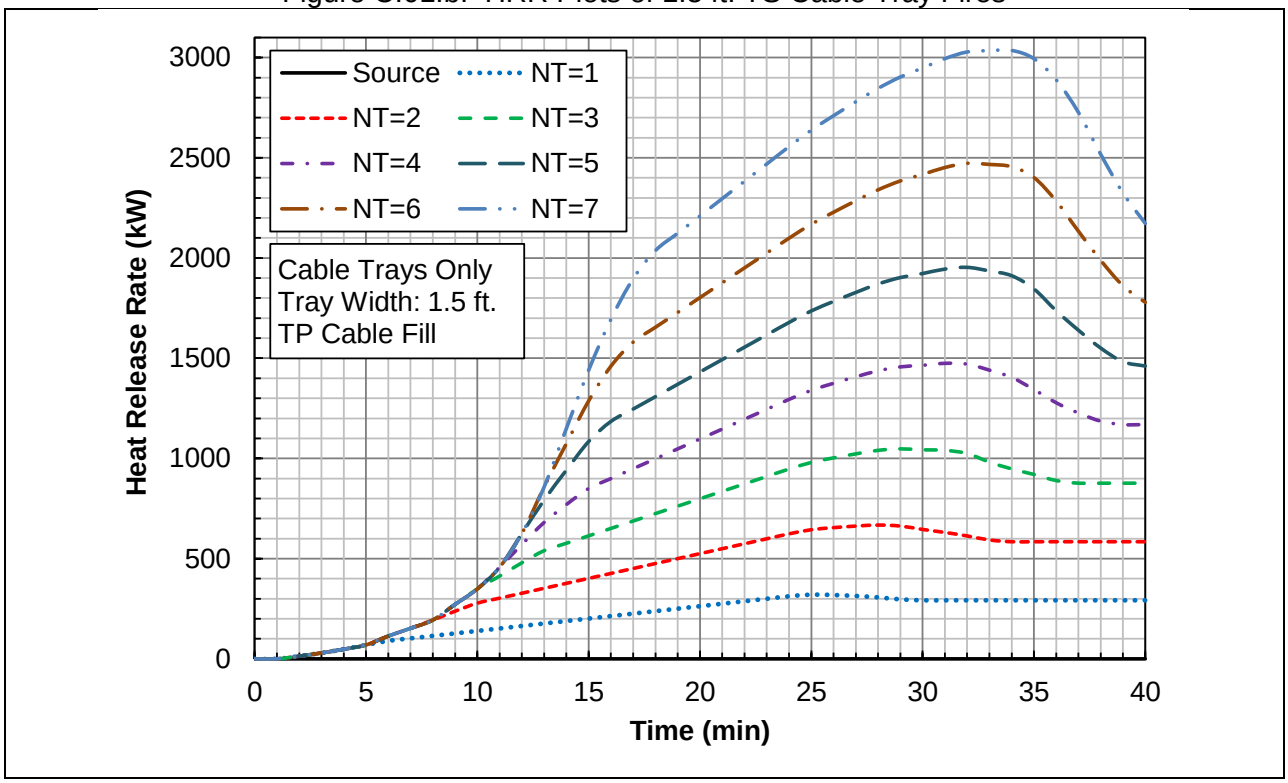

Figure C.01.c: HRR Plots of 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	6	6	6	6	6	6	6	27	27	27	27	27	27	27
3	12	12	12	12	12	12	12	59	59	59	59	59	59	59
4	18	18	18	18	18	18	18	96	96	96	96	96	96	96
5	25	25	25	25	25	25	25	139	139	139	139	139	139	139
6	33	43	43	43	43	43	43	180	227	227	227	227	227	227
7	41	62	62	62	62	62	62	205	305	305	305	305	305	305
8	49	81	81	81	81	81	81	229	387	387	387	387	387	387
9	57	102	117	117	117	117	117	254	475	543	543	543	543	543
10	66	123	153	153	153	153	153	279	556	698	698	698	698	698
11	76	145	191	211	211	211	211	303	606	826	914	914	914	914
12	85	167	230	271	295	295	295	328	655	959	1141	1251	1251	1251
13	95	191	271	332	381	411	411	353	704	1079	1361	1585	1715	1715
14	103	211	309	391	466	525	559	377	754	1153	1540	1883	2148	2299
15	108	230	345	449	550	639	708	402	803	1228	1700	2169	2574	2881
16	112	250	383	508	635	755	859	427	852	1302	1799	2369	2920	3388
17	117	270	421	569	723	873	1012	451	902	1376	1898	2493	3160	3794
18	122	284	454	624	805	987	1162	476	951	1450	1996	2616	3309	4074
19	127	293	483	676	885	1099	1309	501	1001	1524	2095	2740	3457	4247
20	132	303	512	729	966	1212	1459	526	1050	1598	2194	2863	3605	4420
21	137	313	533	774	1039	1317	1601	550	1099	1672	2293	2986	3753	4592
22	142	323	548	813	1106	1418	1739	575	1149	1746	2391	3110	3901	4765
23	147	333	562	841	1163	1508	1867	600	1198	1820	2490	3233	4049	4938
24	152	343	577	860	1197	1576	1973	624	1247	1894	2589	3357	4197	5111
25	157	353	592	880	1222	1617	2053	641	1289	1960	2679	3472	4337	5275
26	162	363	607	900	1247	1647	2101	637	1309	2005	2750	3567	4457	5420
27	167	372	622	920	1271	1677	2135	628	1325	2046	2815	3656	4571	5559
28	172	382	637	939	1296	1706	2170	613	1335	2081	2874	3741	4680	5692
29	177	392	651	959	1321	1736	2205	594	1325	2095	2914	3805	4769	5806
30	182	402	666	979	1345	1765	2239	584	1291	2086	2929	3845	4834	5896
31	187	412	681	999	1370	1795	2274	584	1262	2081	2949	3889	4903	5989
32	191	422	696	1018	1395	1825	2308	584	1227	2049	2941	3907	4945	6056
33	196	432	711	1038	1420	1854	2343	584	1186	1964	2881	3871	4934	6069
34	201	442	725	1058	1444	1884	2377	584	1169	1896	2809	3823	4911	6071
35	206	451	740	1078	1469	1914	2412	584	1169	1840	2687	3691	4803	5989
36	211	461	755	1098	1494	1943	2447	584	1169	1779	2556	3473	4568	5777
37	216	471	770	1117	1518	1973	2481	584	1169	1753	2453	3279	4267	5452
38	221	481	785	1137	1543	2003	2516	584	1169	1753	2372	3101	3976	5034
39	226	491	799	1157	1568	2032	2550	584	1169	1753	2338	2965	3723	4648
40	231	501	814	1177	1592	2062	2585	584	1169	1753	2338	2922	3557	4344

Figure C.02.a: Table of HRRs of 3.0 ft. Cable Tray Fires

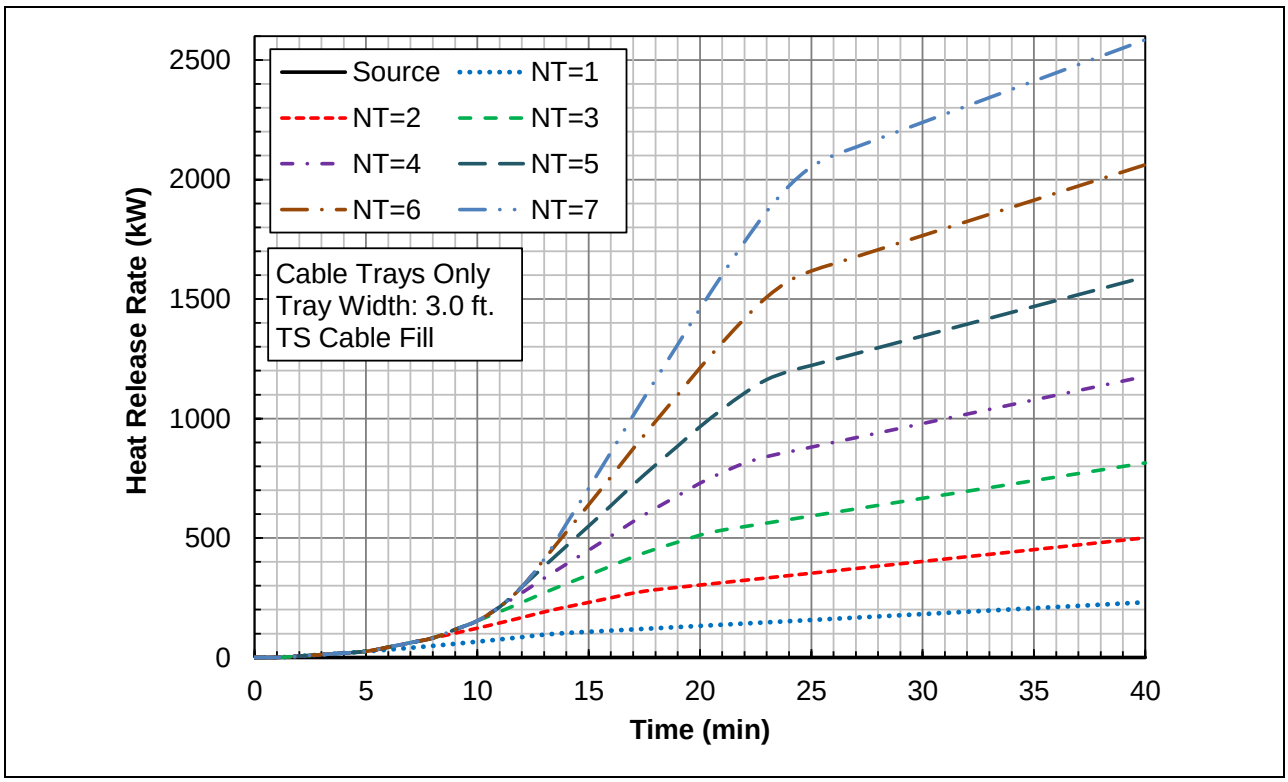

Figure C.02.b: HRR Plots of 3.0 ft. TS Cable Tray Fires

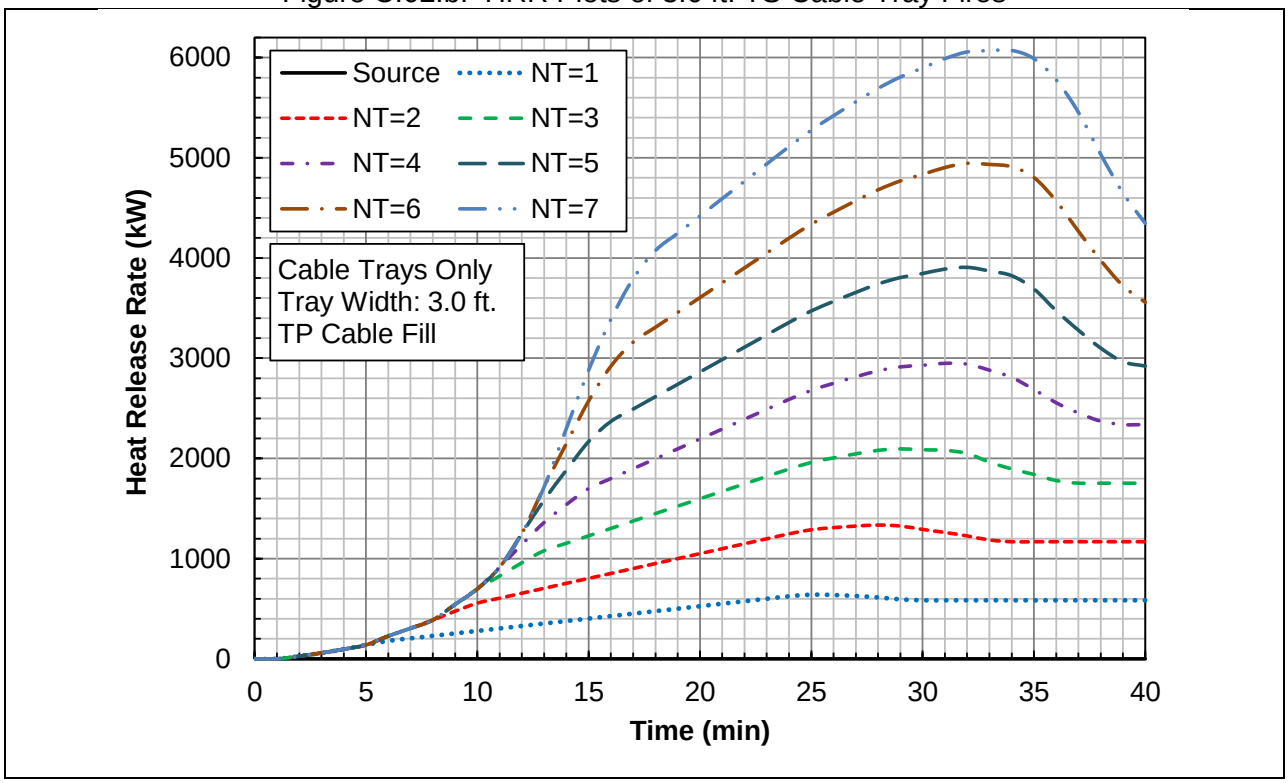

Figure C.02.c: HRR Plots of 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	4	4	4	4	4	4	4	11	11	11	11	11	11	11
3	8	8	8	8	8	8	8	25	25	25	25	25	25	25
4	14	14	14	14	14	14	14	43	43	43	43	43	43	43
5	21	21	21	21	21	21	21	65	65	65	65	65	65	65
6	29	33	33	33	33	33	33	87	107	107	107	107	107	107
7	38	47	47	47	47	47	47	106	148	148	148	148	148	148
8	48	62	62	62	62	62	62	125	192	192	192	192	192	192
9	60	78	85	85	85	85	85	146	240	269	269	269	269	269
10	72	96	109	109	109	109	109	167	286	348	348	348	348	348
11	86	115	135	144	144	144	144	190	321	418	458	458	458	458
12	101	135	163	181	192	192	192	213	357	492	574	625	625	625
13	105	145	180	208	231	244	244	225	381	549	677	781	841	841
14	108	154	197	234	269	296	312	238	406	586	762	921	1045	1116
15	111	163	213	260	307	349	381	250	431	623	839	1057	1247	1392
16	113	171	230	287	346	402	451	262	455	660	889	1154	1412	1633
17	116	180	247	314	386	456	522	275	480	697	938	1216	1529	1829
18	118	187	262	340	423	509	591	287	505	734	987	1277	1604	1966
19	121	192	276	364	460	561	660	299	529	771	1037	1339	1678	2053
20	123	197	290	388	498	613	730	312	554	808	1086	1401	1752	2139
21	122	198	296	406	529	659	794	321	575	842	1132	1459	1822	2222
22	121	200	300	421	557	703	855	330	597	875	1178	1517	1893	2305
23	120	201	304	431	581	743	912	339	618	909	1224	1576	1964	2388
24	119	203	308	438	594	772	960	347	639	942	1270	1634	2034	2471
25	118	204	312	444	603	789	995	354	658	973	1313	1689	2102	2551
26	117	206	316	450	612	800	1015	352	669	997	1349	1737	2163	2624
27	116	207	320	457	621	811	1029	349	677	1018	1382	1783	2220	2694
28	115	209	324	463	630	823	1043	342	683	1036	1413	1826	2276	2762
29	114	210	328	470	638	834	1056	333	680	1045	1435	1860	2322	2821
30	113	212	332	476	647	845	1070	327	666	1043	1445	1883	2357	2868
31	112	213	336	483	656	857	1084	323	652	1041	1455	1906	2393	2916
32	111	215	340	489	665	868	1098	320	635	1028	1454	1916	2416	2951
33	110	216	344	495	674	879	1112	316	616	990	1428	1903	2415	2963
34	109	218	347	502	683	891	1126	313	605	958	1396	1884	2407	2968
35	108	219	351	508	692	902	1139	309	602	931	1341	1824	2360	2933
36	107	220	355	515	701	914	1153	306	598	902	1280	1724	2253	2838
37	106	222	359	521	710	925	1167	303	595	887	1231	1634	2113	2687
38	105	223	363	528	719	936	1181	299	591	883	1191	1550	1977	2492
39	105	225	367	534	727	948	1195	296	588	880	1172	1484	1857	2310
40	104	226	371	540	736	959	1209	292	584	877	1169	1461	1777	2165

Figure C.03.a: Table of HRRs of Motor & 1.5 ft. Cable Tray Fires

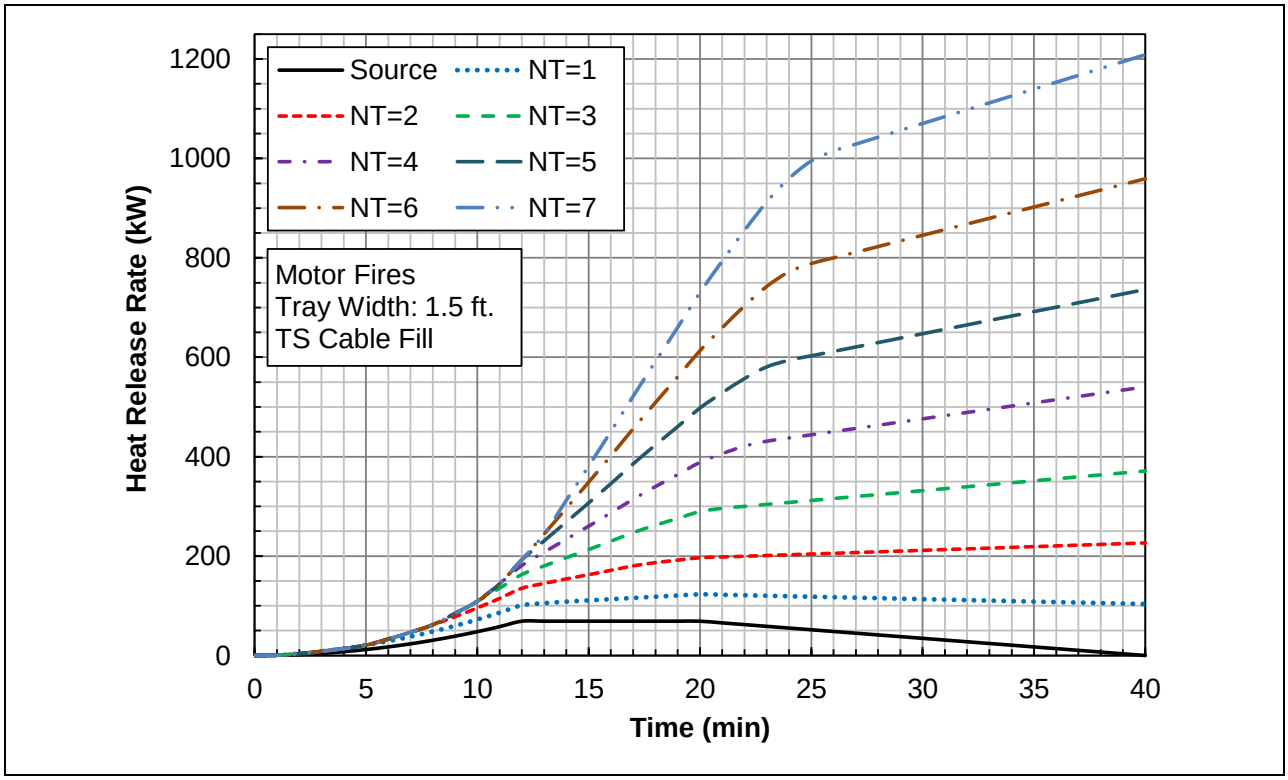

Figure C.03.b: HRR Plots of Motor & 1.5 ft. TS Cable Tray Fires

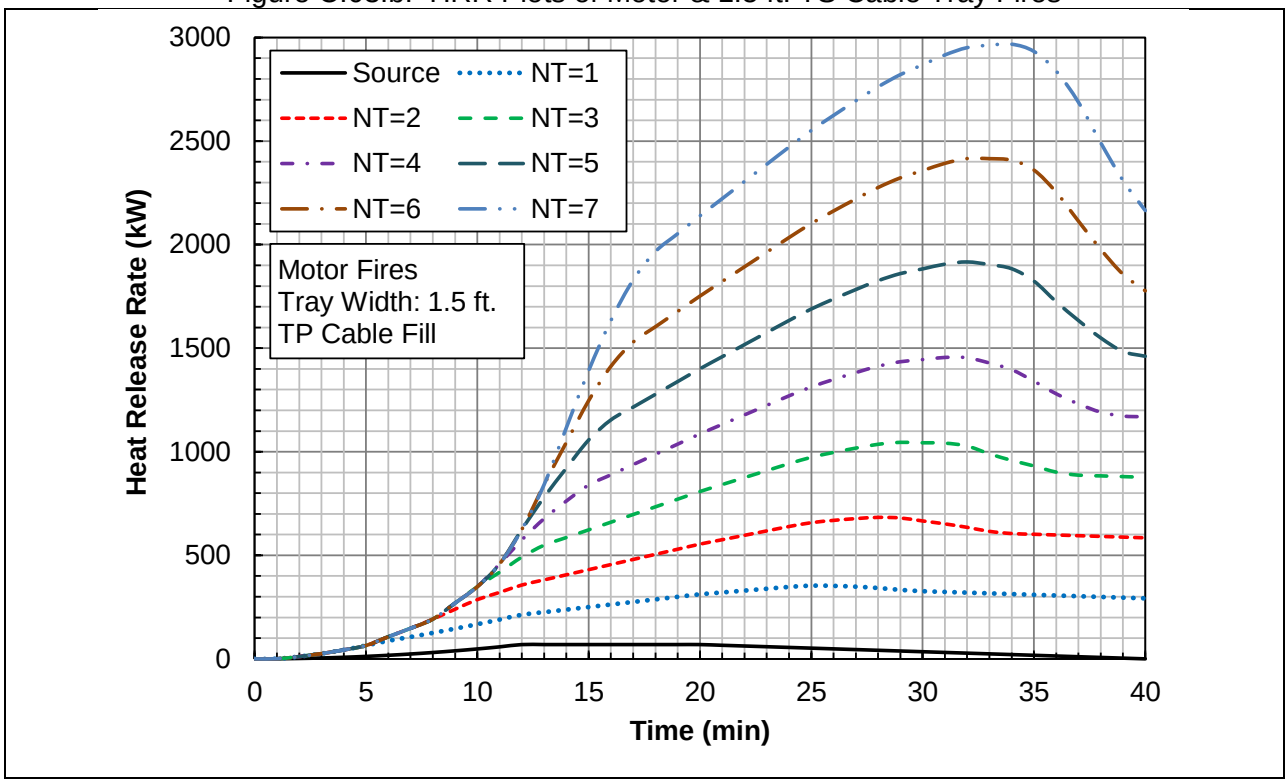

Figure C.03.c: HRR Plots of Motor & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	6	6	6	6	6	6	6	20	20	20	20	20	20	20
3	12	12	12	12	12	12	12	46	46	46	46	46	46	46
4	20	20	20	20	20	20	20	79	79	79	79	79	79	79
5	30	30	30	30	30	30	30	117	117	117	117	117	117	117
6	40	49	49	49	49	49	49	157	196	196	196	196	196	196
7	52	70	70	70	70	70	70	188	272	272	272	272	272	272
8	66	93	93	93	93	93	93	220	353	353	353	353	353	353
9	81	117	131	131	131	131	131	253	440	500	500	500	500	500
10	97	144	171	171	171	171	171	287	524	649	649	649	649	649
11	114	172	213	231	231	231	231	321	584	778	859	859	859	859
12	133	201	257	293	316	316	316	357	644	914	1080	1181	1181	1181
13	141	221	291	347	392	420	420	382	693	1029	1285	1492	1614	1614
14	148	239	325	399	468	524	556	407	743	1103	1455	1774	2022	2164
15	153	256	357	451	545	628	693	431	792	1177	1610	2044	2425	2714
16	158	274	391	505	623	735	832	456	842	1251	1708	2239	2756	3198
17	162	291	425	560	702	843	974	481	891	1325	1807	2362	2990	3590
18	167	305	455	611	778	949	1113	505	940	1399	1906	2486	3138	3864
19	172	315	482	659	852	1052	1251	530	990	1473	2005	2609	3286	4036
20	177	324	510	708	927	1158	1391	555	1039	1547	2103	2732	3434	4209
21	179	331	527	746	992	1253	1522	576	1085	1618	2199	2852	3579	4379
22	180	337	538	780	1052	1344	1648	597	1131	1688	2294	2972	3724	4548
23	182	344	549	804	1103	1426	1766	618	1177	1759	2389	3092	3868	4717
24	183	350	561	820	1133	1488	1864	640	1223	1830	2485	3212	4013	4887
25	185	357	572	836	1154	1525	1938	655	1263	1895	2574	3327	4152	5051
26	186	363	583	853	1175	1552	1982	656	1289	1945	2649	3427	4277	5200
27	188	369	595	869	1196	1578	2013	652	1310	1990	2719	3521	4396	5344
28	189	376	606	885	1218	1604	2044	643	1325	2030	2784	3611	4510	5483
29	191	382	617	901	1239	1630	2075	628	1323	2053	2831	3683	4607	5604
30	192	389	629	918	1260	1656	2106	619	1297	2052	2855	3731	4680	5702
31	194	395	640	934	1281	1682	2137	615	1272	2052	2880	3780	4754	5800
32	195	401	652	950	1303	1709	2168	612	1242	2028	2880	3805	4804	5875
33	197	408	663	967	1324	1735	2199	609	1207	1956	2833	3783	4806	5902
34	198	414	674	983	1345	1761	2230	605	1189	1896	2772	3747	4794	5915
35	200	421	686	999	1366	1787	2262	602	1186	1845	2664	3631	4703	5848
36	201	427	697	1016	1388	1813	2293	598	1183	1790	2546	3434	4492	5662
37	203	434	708	1032	1409	1840	2324	595	1179	1764	2452	3257	4216	5365
38	204	440	720	1048	1430	1866	2355	591	1176	1760	2375	3093	3948	4977
39	206	446	731	1064	1451	1892	2386	588	1172	1757	2341	2965	3711	4616
40	207	453	742	1081	1473	1918	2417	584	1169	1753	2338	2922	3554	4329

Figure C.04.a: Table of HRRs of Motor & 3.0 ft. Cable Tray Fires

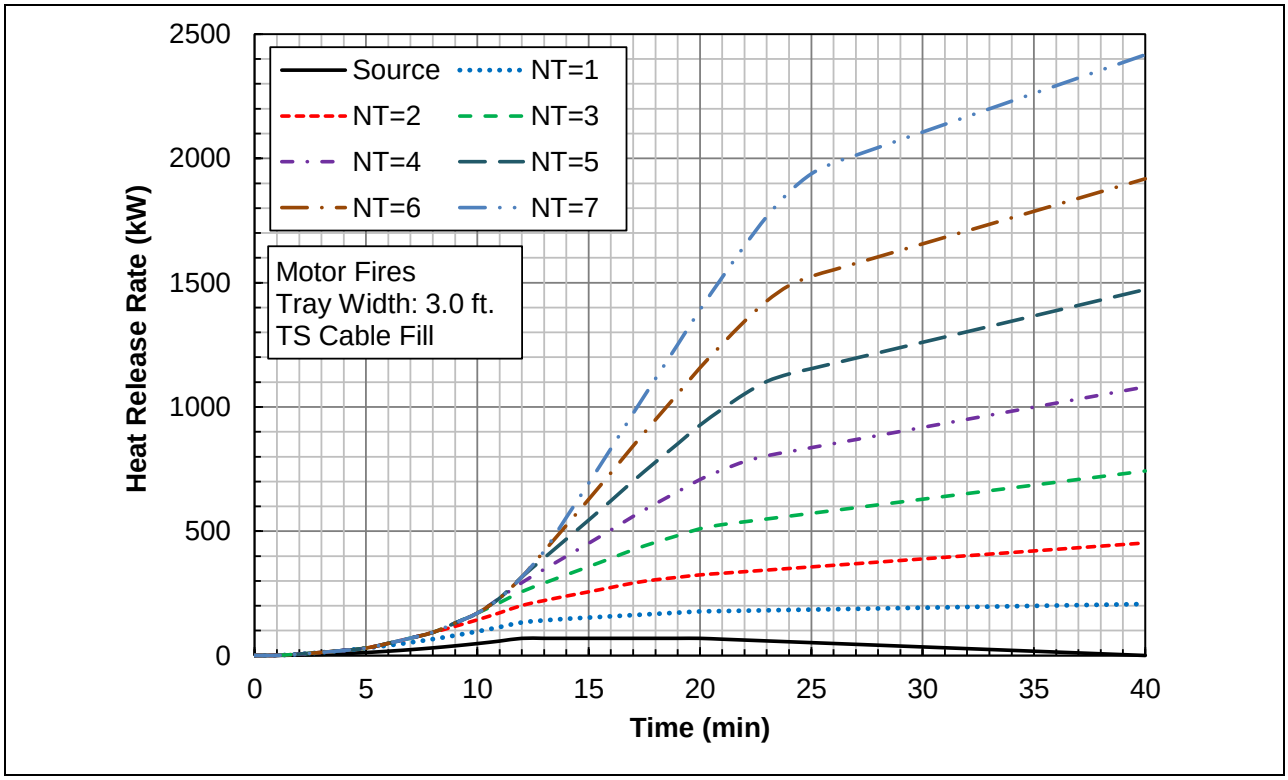

Figure C.04.b: HRR Plots of Motor & 3.0 ft. TS Cable Tray Fires

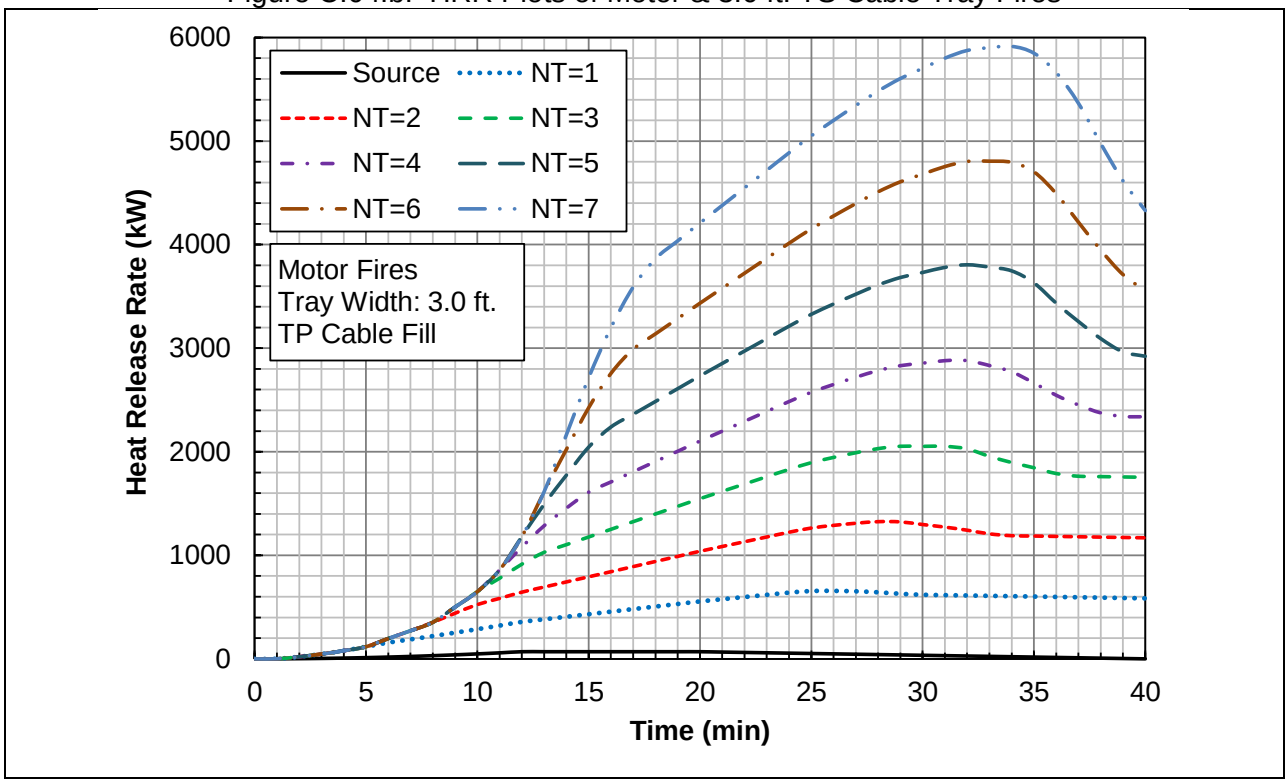

Figure C.04.c: HRR Plots of Motor & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	9	9	9	9	9	9	9	20	20	20	20	20	20	20
3	19	19	19	19	19	19	19	43	43	43	43	43	43	43
4	33	33	33	33	33	33	33	72	72	72	72	72	72	72
5	50	50	50	50	50	50	50	107	107	107	107	107	107	107
6	69	75	75	75	75	75	75	144	168	168	168	168	168	168
7	92	103	103	103	103	103	103	175	226	226	226	226	226	226
8	119	135	135	135	135	135	135	210	290	290	290	290	290	290
9	148	170	178	178	178	178	178	247	359	393	393	393	393	393
10	180	209	224	224	224	224	224	287	427	498	498	498	498	498
11	216	251	274	284	284	284	284	330	483	593	638	638	638	638
12	254	296	328	348	360	360	360	376	541	694	786	841	841	841
13	259	307	348	378	403	418	418	389	566	754	896	1009	1074	1074
14	263	318	367	408	446	476	493	401	590	791	986	1158	1291	1367
15	266	328	385	438	488	533	568	413	615	829	1066	1301	1505	1659
16	268	337	404	467	531	591	643	426	640	866	1115	1402	1678	1913
17	270	347	423	498	575	651	720	438	664	903	1165	1464	1799	2117
18	273	354	440	526	617	708	796	450	689	940	1214	1525	1873	2257
19	275	359	454	552	657	764	870	463	714	977	1264	1587	1947	2343
20	278	364	469	578	697	821	945	475	738	1014	1313	1649	2021	2430
21	270	359	469	590	723	863	1006	477	753	1040	1352	1700	2084	2505
22	262	353	466	599	747	903	1064	479	767	1067	1391	1751	2148	2581
23	254	347	463	603	765	938	1118	480	781	1093	1429	1802	2211	2657
24	246	342	460	602	771	961	1160	482	795	1120	1468	1853	2275	2733
25	237	336	457	601	773	971	1190	480	805	1142	1503	1900	2334	2805
26	229	330	453	601	775	976	1203	467	805	1154	1527	1937	2383	2866
27	221	325	450	600	777	980	1210	452	801	1163	1549	1971	2430	2925
28	213	319	447	599	778	984	1217	434	796	1170	1568	2002	2473	2981
29	205	314	444	599	780	988	1224	413	780	1166	1577	2023	2507	3027
30	197	308	441	598	782	993	1230	398	752	1151	1573	2033	2528	3060
31	189	302	438	597	784	997	1237	387	726	1137	1572	2044	2552	3096
32	181	297	435	597	786	1001	1244	377	698	1110	1558	2042	2562	3119
33	173	291	431	596	787	1006	1250	366	667	1057	1516	2013	2545	3114
34	165	286	428	595	789	1010	1257	355	648	1012	1469	1978	2523	3104
35	157	280	425	595	791	1014	1264	345	637	973	1398	1901	2458	3052
36	149	274	422	594	793	1018	1271	334	627	932	1321	1780	2329	2935
37	140	269	419	593	795	1023	1277	324	616	908	1259	1672	2167	2761
38	132	263	416	593	796	1027	1284	313	605	898	1207	1572	2010	2540
39	124	257	413	592	798	1031	1291	303	595	887	1179	1493	1872	2335
40	116	252	409	591	800	1035	1298	292	584	877	1169	1461	1779	2173

Figure C.05.a: Table of HRRs of Pump & 1.5 ft. Cable Tray Fires

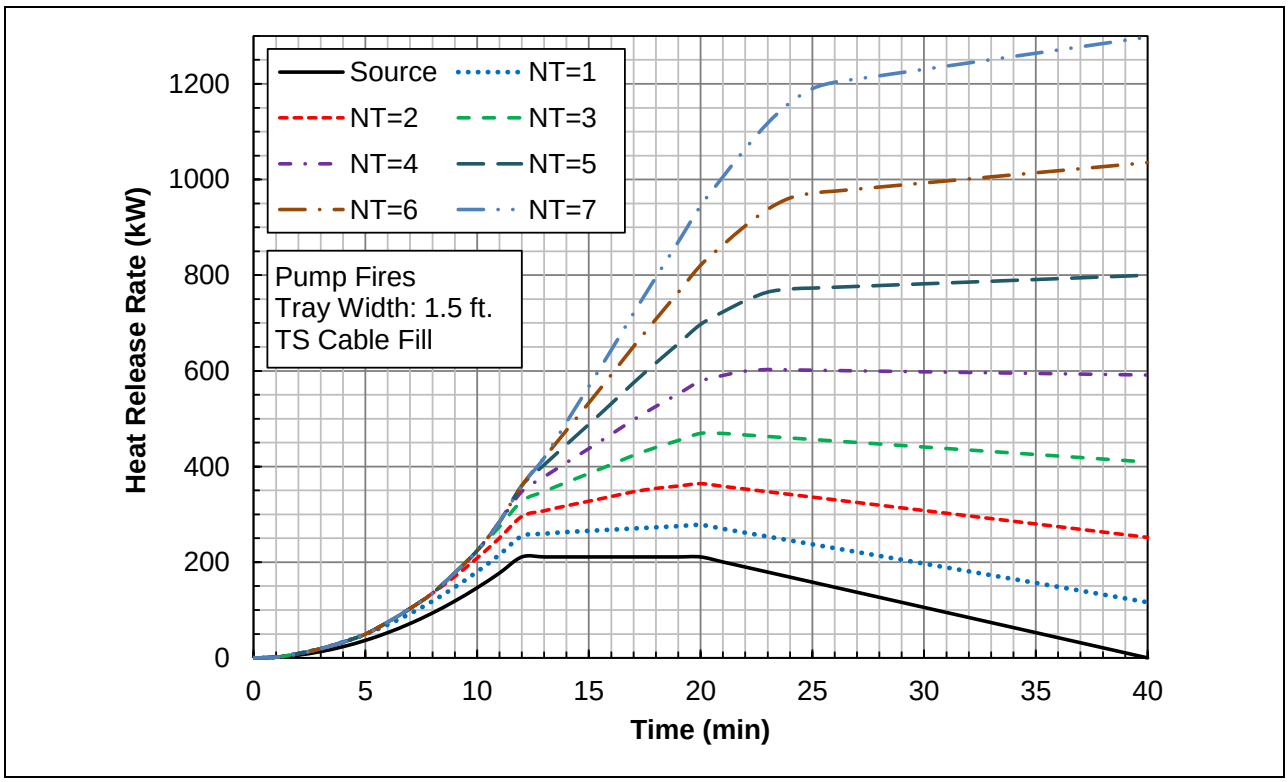

Figure C.05.b: HRR Plots of Pump & 1.5 ft. TS Cable Tray Fires

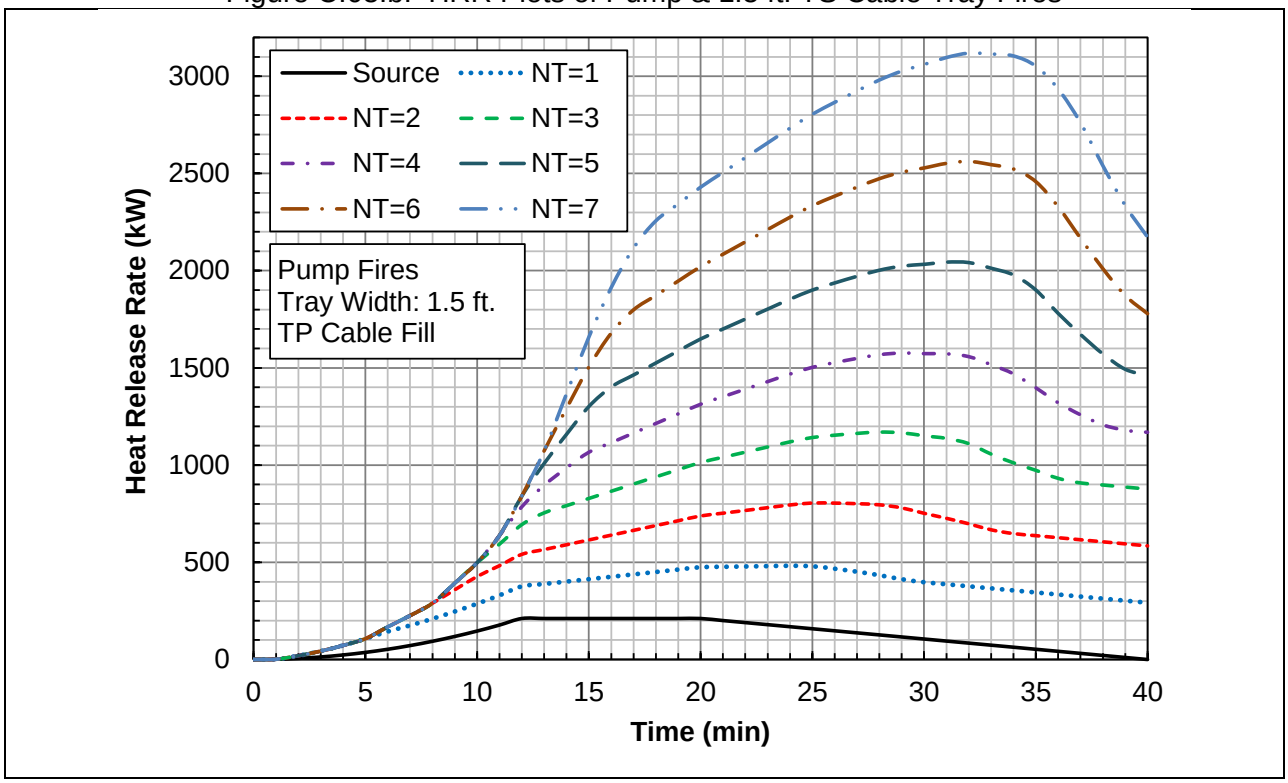

Figure C.05.c: HRR Plots of Pump & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	12	12	12	12	12	12	12	33	33	33	33	33	33	33
3	25	25	25	25	25	25	25	73	73	73	73	73	73	73
4	42	42	42	42	42	42	42	121	121	121	121	121	121	121
5	63	63	63	63	63	63	63	178	178	178	178	178	178	178
6	86	97	97	97	97	97	97	235	283	283	283	283	283	283
7	113	135	135	135	135	135	135	279	380	380	380	380	380	380
8	143	176	176	176	176	176	176	326	485	485	485	485	485	485
9	177	222	237	237	237	237	237	375	599	667	667	667	667	667
10	214	271	302	302	302	302	302	428	708	850	850	850	850	850
11	254	324	371	391	391	391	391	483	788	1009	1099	1099	1099	1099
12	298	380	444	485	509	509	509	542	871	1177	1360	1470	1470	1470
13	308	404	485	546	596	625	625	566	920	1298	1581	1806	1937	1937
14	315	425	523	606	681	740	775	591	970	1372	1760	2105	2372	2523
15	320	444	560	664	766	855	924	616	1019	1446	1921	2392	2799	3106
16	325	464	597	724	852	972	1076	640	1068	1520	2020	2593	3146	3615
17	330	484	636	785	939	1091	1230	665	1118	1594	2119	2716	3386	4022
18	335	498	669	840	1022	1205	1380	690	1167	1668	2217	2840	3535	4302
19	340	507	698	893	1102	1317	1528	714	1217	1742	2316	2963	3683	4475
20	345	517	728	946	1183	1430	1678	739	1266	1816	2415	3086	3831	4648
21	339	517	738	980	1246	1526	1811	753	1305	1880	2503	3199	3968	4810
22	334	516	742	1009	1303	1616	1939	767	1344	1943	2591	3312	4106	4973
23	328	515	746	1026	1350	1696	2056	781	1382	2007	2680	3425	4244	5135
24	322	515	751	1035	1374	1754	2152	796	1421	2070	2768	3538	4381	5297
25	317	514	755	1044	1388	1785	2221	801	1452	2125	2848	3642	4510	5451
26	311	513	759	1054	1402	1804	2259	786	1461	2160	2907	3726	4619	5584
27	305	513	763	1063	1416	1823	2283	766	1466	2189	2960	3805	4722	5712
28	300	512	768	1072	1430	1842	2307	741	1465	2213	3009	3878	4820	5835
29	294	511	772	1081	1444	1861	2331	710	1444	2216	3037	3931	4898	5937
30	289	511	776	1090	1458	1880	2355	690	1399	2196	3041	3960	4951	6015
31	283	510	780	1100	1473	1899	2379	679	1358	2180	3050	3993	5009	6098
32	277	509	785	1109	1487	1918	2403	669	1312	2136	3031	3999	5040	6153
33	272	508	789	1118	1501	1937	2427	658	1261	2039	2959	3951	5017	6155
34	266	508	793	1127	1515	1956	2451	648	1232	1960	2875	3893	4983	6146
35	261	507	797	1136	1529	1975	2475	637	1222	1893	2743	3749	4863	6051
36	255	506	802	1146	1543	1994	2499	627	1211	1822	2599	3518	4615	5828
37	249	506	806	1155	1557	2013	2523	616	1200	1785	2486	3313	4302	5490
38	244	505	810	1164	1572	2033	2547	605	1190	1774	2393	3123	4000	5059
39	238	504	815	1173	1586	2052	2571	595	1179	1764	2348	2975	3734	4660
40	232	504	819	1182	1600	2071	2595	584	1169	1753	2338	2922	3558	4345

Figure C.06.a: Table of HRRs of Pump & 3.0 ft. Cable Tray Fires

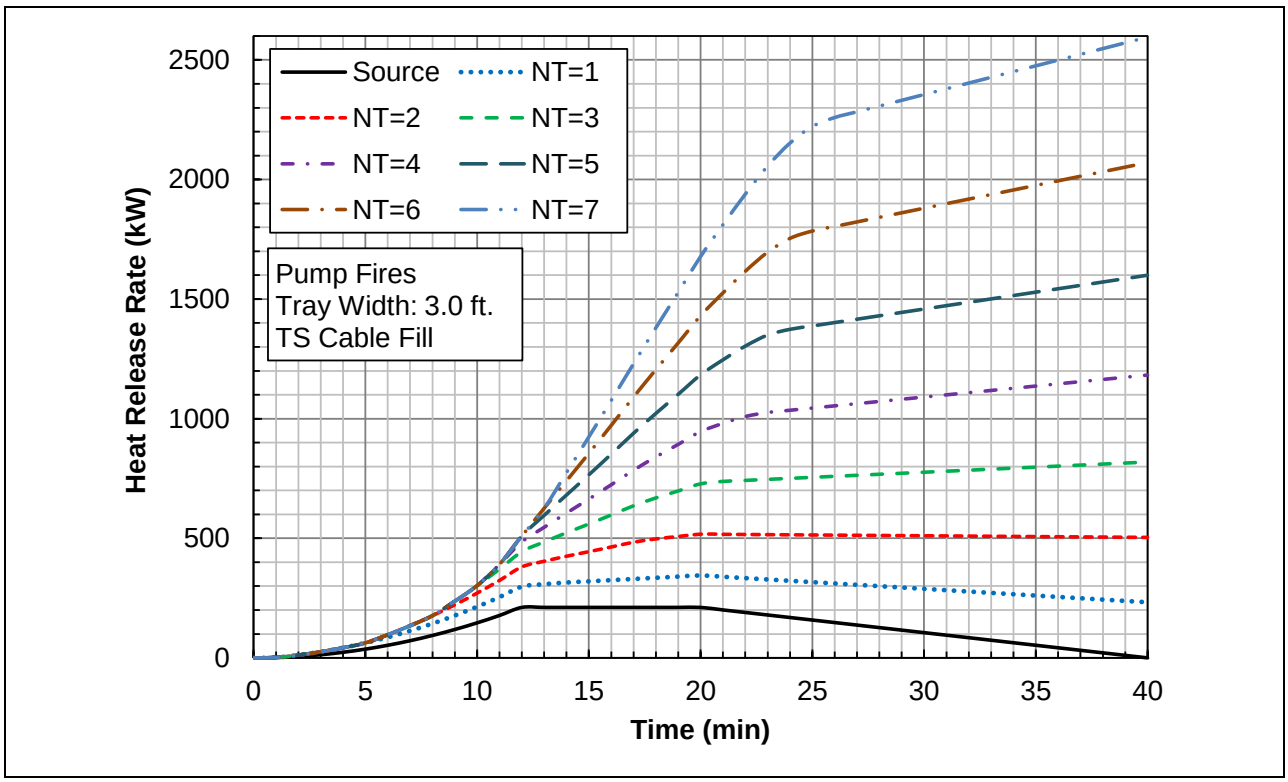

Figure C.06.b: HRR Plots of Pump & 3.0 ft. TS Cable Tray Fires

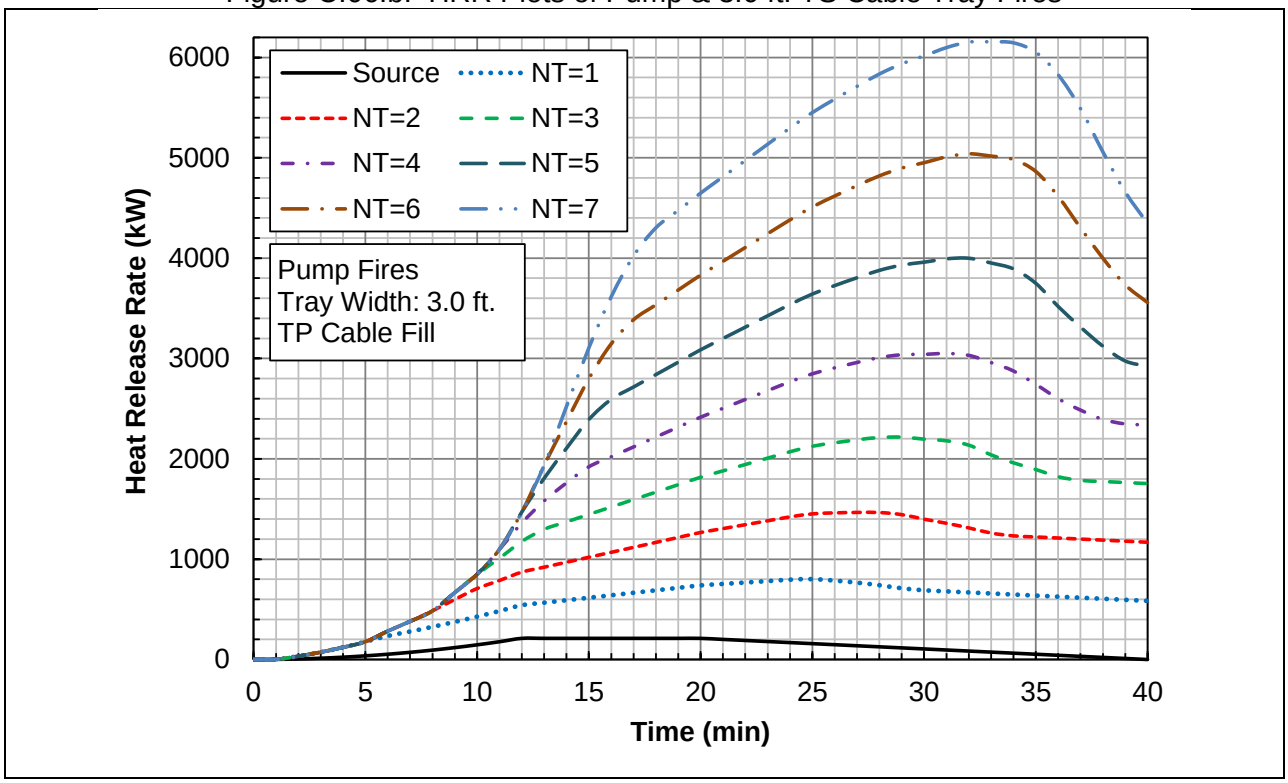

Figure C.06.c: HRR Plots of Pump & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	79	79	79	79	79	79	79	79	79	79	79	79	79	79
2	320	320	320	320	320	320	320	333	333	333	333	333	333	333
3	324	324	324	324	324	324	324	351	351	351	351	351	351	351
4	328	328	328	328	328	328	328	373	373	373	373	373	373	373
5	292	292	292	292	292	292	292	357	357	357	357	357	357	357
6	257	263	263	263	263	263	263	339	366	366	366	366	366	366
7	222	234	234	234	234	234	234	312	367	367	367	367	367	367
8	187	205	205	205	205	205	205	285	371	371	371	371	371	371
9	152	176	185	185	185	185	185	258	378	415	415	415	415	415
10	117	148	165	165	165	165	165	230	381	456	456	456	456	456
11	83	121	146	157	157	157	157	203	366	483	530	530	530	530
12	49	94	128	149	162	162	162	176	351	512	609	666	666	666
13	55	107	149	182	208	223	223	188	375	575	723	840	907	907
14	58	118	170	213	252	283	301	200	400	612	815	994	1131	1209
15	61	128	189	244	297	343	378	213	425	649	897	1141	1351	1509
16	63	138	209	275	342	404	457	225	450	686	946	1243	1528	1769
17	66	149	229	307	387	466	537	237	474	723	995	1305	1650	1977
18	68	156	246	336	431	525	615	250	499	760	1045	1366	1724	2119
19	71	161	261	363	472	583	692	262	524	797	1094	1428	1798	2205
20	73	166	277	391	514	642	769	274	548	834	1144	1490	1872	2291
21	76	171	287	414	552	696	843	287	573	871	1193	1551	1946	2378
22	78	175	295	434	587	749	914	299	598	908	1242	1613	2020	2464
23	81	180	302	448	616	795	980	311	622	945	1292	1675	2095	2551
24	83	185	310	458	634	830	1034	324	647	982	1341	1737	2169	2637
25	85	190	317	468	646	851	1075	331	667	1014	1385	1793	2238	2718
26	88	195	324	478	658	865	1099	327	675	1034	1418	1838	2295	2788
27	90	200	332	488	671	880	1117	320	680	1052	1448	1881	2350	2855
28	93	205	339	498	683	895	1134	310	683	1067	1476	1920	2402	2920
29	95	210	347	508	695	910	1151	298	674	1071	1492	1949	2443	2973
30	98	215	354	517	708	925	1168	292	654	1063	1496	1966	2472	3014
31	100	220	361	527	720	939	1186	292	637	1058	1504	1986	2504	3059
32	103	225	369	537	732	954	1203	292	617	1039	1497	1991	2522	3089
33	105	230	376	547	745	969	1220	292	594	991	1461	1968	2511	3091
34	108	235	384	557	757	984	1238	292	584	954	1421	1940	2495	3087
35	110	240	391	567	769	999	1255	292	584	923	1355	1868	2436	3040
36	113	245	398	577	782	1014	1272	292	584	891	1285	1752	2310	2926
37	115	250	406	587	794	1028	1289	292	584	877	1230	1649	2151	2755
38	118	254	413	596	806	1043	1307	292	584	877	1187	1555	1999	2536
39	120	259	421	606	819	1058	1324	292	584	877	1169	1483	1866	2334
40	122	264	428	616	831	1073	1341	292	584	877	1169	1461	1780	2177

Figure C.07.a: Table of HRRs of Loose Transient & 1.5 ft. Cable Tray Fires

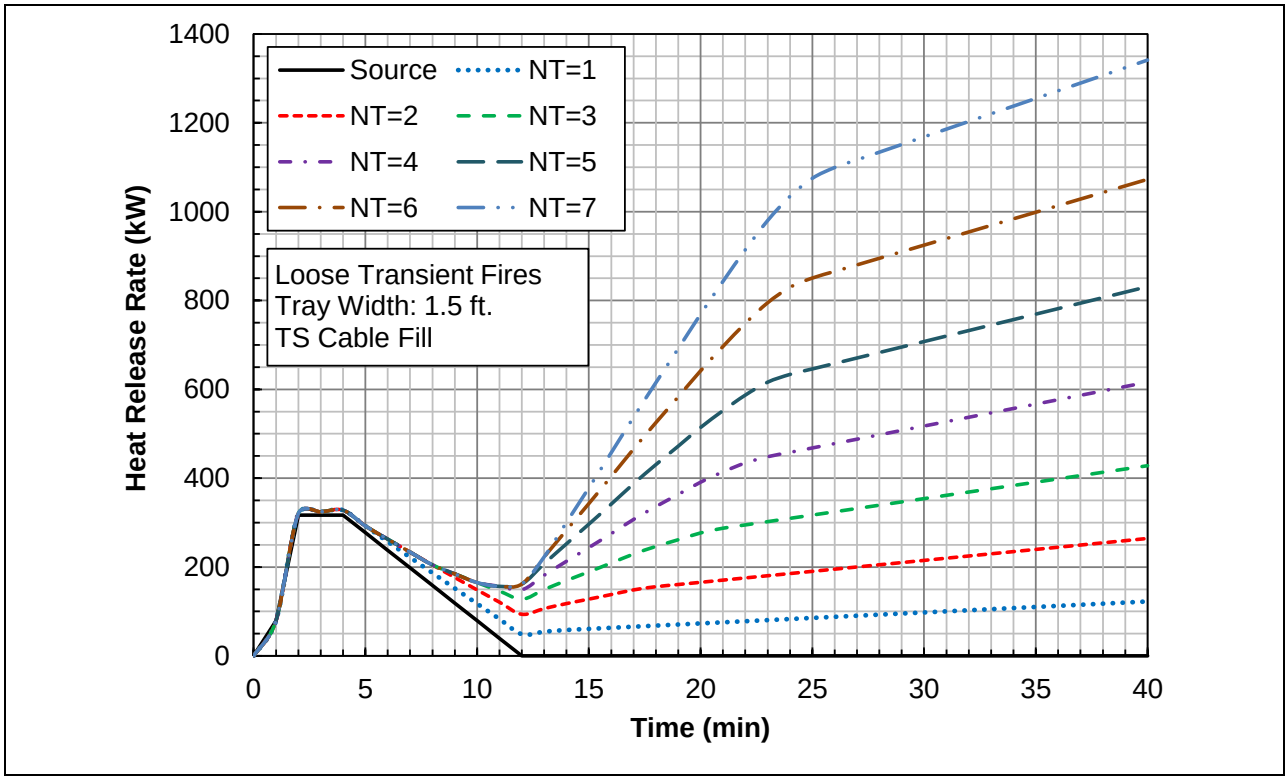

Figure C.07.b: HRR Plots of Loose Transient & 1.5 ft. TS Cable Tray Fires

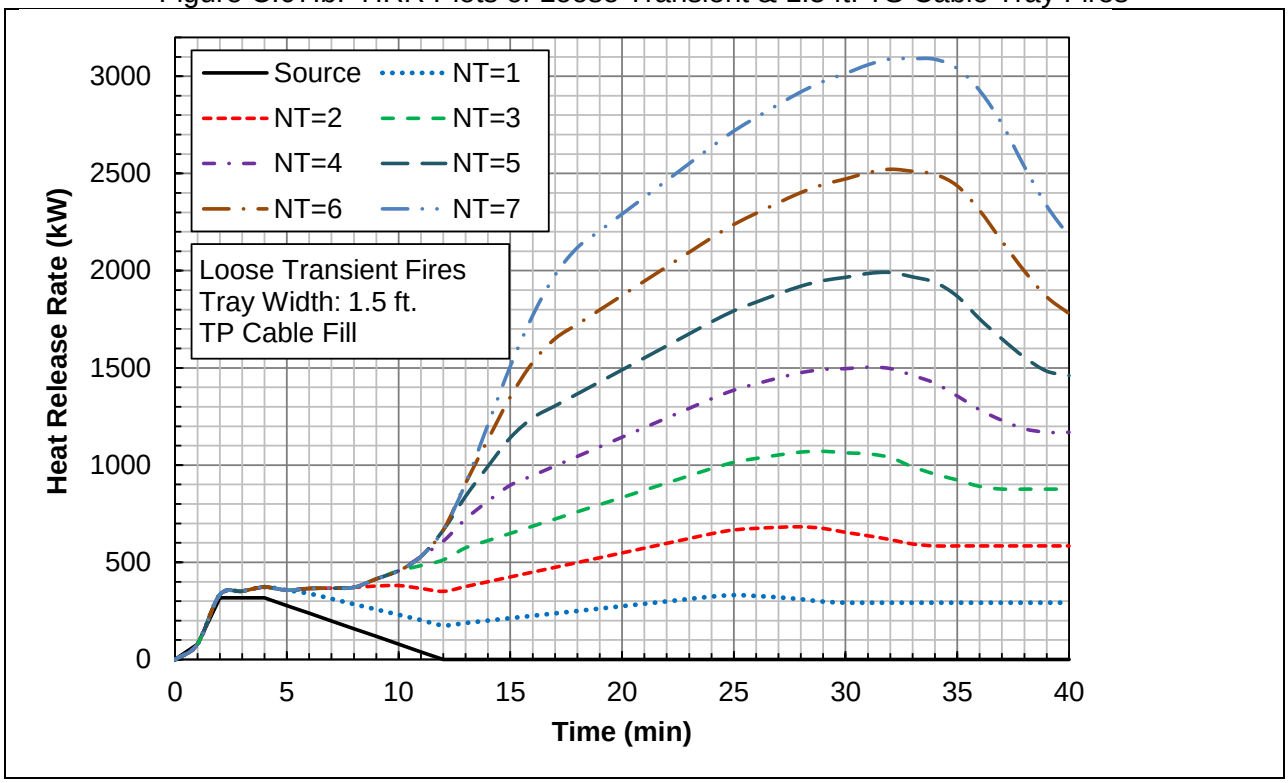

Figure C.07.c: HRR Plots of Loose Transient & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	79	79	79	79	79	79	79	79	79	79	79	79	79	79
2	324	324	324	324	324	324	324	349	349	349	349	349	349	349
3	331	331	331	331	331	331	331	386	386	386	386	386	386	386
4	339	339	339	339	339	339	339	428	428	428	428	428	428	428
5	307	307	307	307	307	307	307	436	436	436	436	436	436	436
6	276	288	288	288	288	288	288	441	493	493	493	493	493	493
7	245	269	269	269	269	269	269	426	536	536	536	536	536	536
8	215	251	251	251	251	251	251	411	584	584	584	584	584	584
9	185	234	250	250	250	250	250	396	637	710	710	710	710	710
10	156	218	251	251	251	251	251	381	682	833	833	833	833	833
11	126	202	252	273	273	273	273	366	692	926	1020	1020	1020	1020
12	98	187	255	298	323	323	323	351	702	1025	1217	1332	1332	1332
13	109	213	299	363	415	446	446	376	751	1149	1446	1680	1814	1814
14	117	235	339	426	505	566	601	401	800	1223	1629	1988	2263	2418
15	122	256	378	488	593	686	757	425	850	1297	1793	2282	2702	3018
16	126	276	418	550	683	808	915	450	899	1371	1892	2486	3056	3538
17	131	297	458	614	775	931	1075	475	948	1446	1991	2609	3300	3953
18	136	311	493	672	861	1050	1230	499	998	1520	2090	2733	3448	4237
19	141	321	523	727	944	1166	1384	524	1047	1594	2188	2856	3596	4410
20	146	331	554	782	1028	1284	1539	549	1097	1668	2287	2979	3745	4583
21	151	341	575	828	1104	1393	1686	574	1146	1742	2386	3103	3893	4755
22	156	351	590	869	1174	1497	1828	598	1195	1816	2485	3226	4041	4928
23	161	361	604	897	1232	1590	1960	623	1245	1890	2583	3350	4189	5101
24	166	371	619	916	1267	1660	2069	648	1294	1964	2682	3473	4337	5274
25	171	381	634	936	1292	1701	2150	662	1334	2028	2771	3587	4475	5437
26	176	390	649	956	1317	1731	2199	654	1349	2069	2836	3677	4590	5576
27	181	400	664	976	1341	1760	2233	639	1360	2104	2896	3761	4699	5710
28	186	410	678	995	1366	1790	2268	620	1365	2134	2951	3841	4804	5839
29	191	420	693	1015	1391	1820	2302	596	1349	2142	2984	3898	4886	5946
30	196	430	708	1035	1415	1849	2337	584	1308	2126	2992	3932	4944	6029
31	201	440	723	1055	1440	1879	2372	584	1273	2116	3007	3971	5008	6118
32	205	450	738	1074	1465	1909	2406	584	1234	2077	2993	3982	5043	6178
33	210	460	753	1094	1489	1938	2441	584	1188	1982	2923	3936	5022	6181
34	215	469	767	1114	1514	1968	2475	584	1169	1907	2842	3880	4991	6175
35	220	479	782	1134	1539	1997	2510	584	1169	1847	2711	3736	4872	6080
36	225	489	797	1153	1563	2027	2544	584	1169	1781	2569	3504	4620	5853
37	230	499	812	1173	1588	2057	2579	584	1169	1753	2460	3298	4302	5509
38	235	509	827	1193	1613	2086	2613	584	1169	1753	2374	3110	3997	5072
39	240	519	841	1213	1638	2116	2648	584	1169	1753	2338	2967	3732	4668
40	245	529	856	1232	1662	2146	2683	584	1169	1753	2338	2922	3559	4353

Figure C.08.a: Table of HRRs of Loose Transient & 3.0 ft. Cable Tray Fires

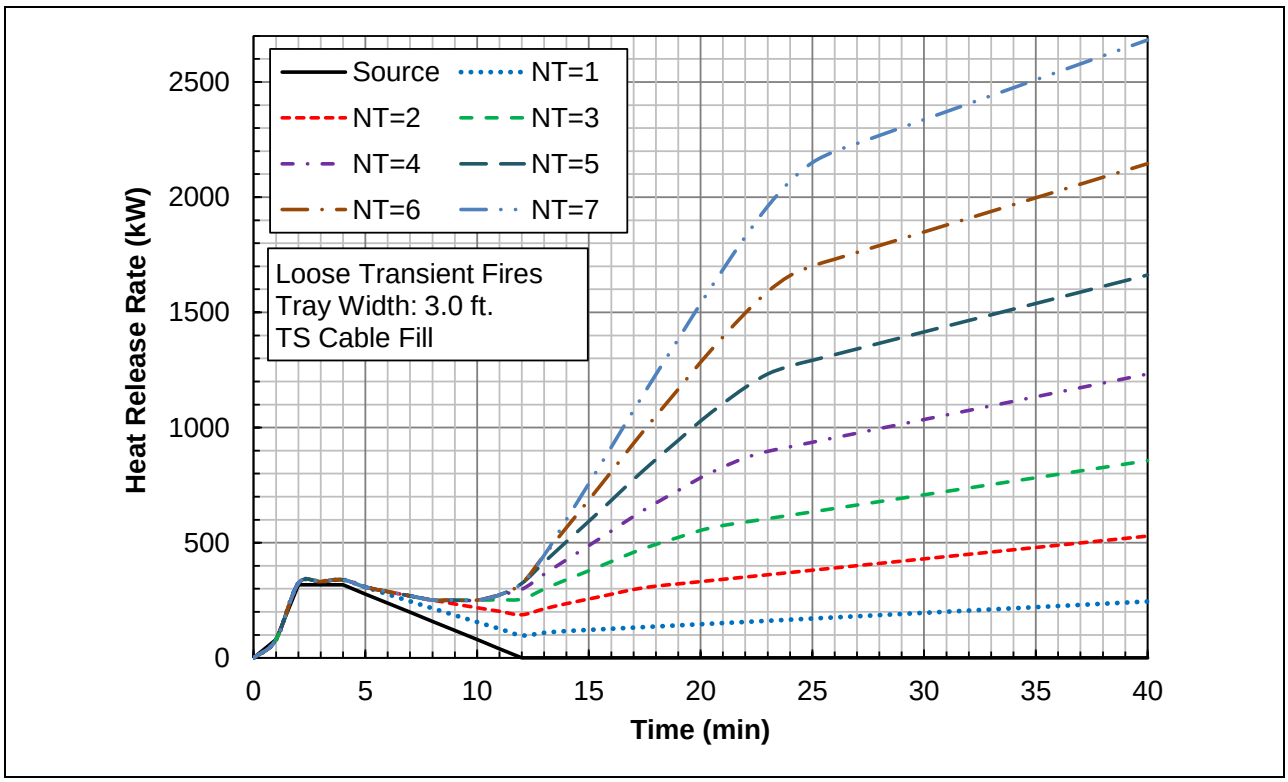

Figure C.08.b: HRR Plots of Loose Transient & 3.0 ft. TS Cable Tray Fires

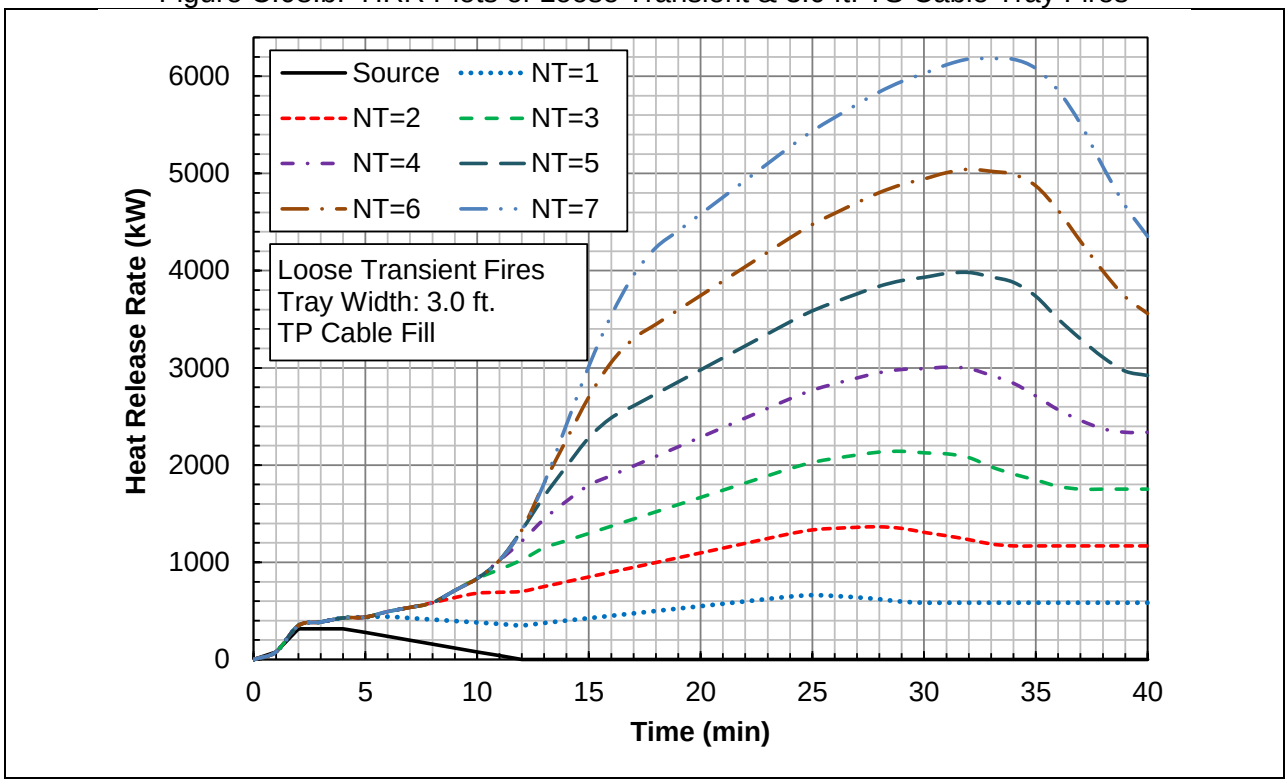

Figure C.08.c: HRR Plots of Loose Transient & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2	23	23	23	23	23	23	23	36	36	36	36	36	36	36
3	52	52	52	52	52	52	52	79	79	79	79	79	79	79
4	90	90	90	90	90	90	90	135	135	135	135	135	135	135
5	139	139	139	139	139	139	139	203	203	203	203	203	203	203
6	198	203	203	203	203	203	203	280	306	306	306	306	306	306
7	266	278	278	278	278	278	278	357	412	412	412	412	412	412
8	345	363	363	363	363	363	363	443	530	530	530	530	530	530
9	350	375	383	383	383	383	383	456	576	613	613	613	613	613
10	355	386	403	403	403	403	403	468	618	694	694	694	694	694
11	360	398	423	434	434	434	434	480	643	760	807	807	807	807
12	326	371	405	426	439	439	439	453	628	790	886	943	943	943
13	292	344	387	419	445	461	461	426	613	812	961	1078	1145	1145
14	256	316	368	411	450	481	499	398	598	810	1013	1192	1329	1407
15	219	286	348	402	455	501	537	371	583	807	1055	1299	1509	1668
16	182	257	328	394	460	523	576	344	568	805	1065	1362	1647	1888
17	145	228	308	386	467	545	617	317	553	802	1075	1384	1729	2056
18	108	195	286	376	470	565	655	289	539	799	1084	1406	1764	2158
19	71	161	261	363	472	583	692	262	524	797	1094	1428	1798	2205
20	73	166	277	391	514	642	769	274	548	834	1144	1490	1872	2291
21	76	171	287	414	552	696	843	287	573	871	1193	1551	1946	2378
22	78	175	295	434	587	749	914	299	598	908	1242	1613	2020	2464
23	81	180	302	448	616	795	980	311	622	945	1292	1675	2095	2551
24	83	185	310	458	634	830	1034	324	647	982	1341	1737	2169	2637
25	85	190	317	468	646	851	1075	331	667	1014	1385	1793	2238	2718
26	88	195	324	478	658	865	1099	327	675	1034	1418	1838	2295	2788
27	90	200	332	488	671	880	1117	320	680	1052	1448	1881	2350	2855
28	93	205	339	498	683	895	1134	310	683	1067	1476	1920	2402	2920
29	95	210	347	508	695	910	1151	298	674	1071	1492	1949	2443	2973
30	98	215	354	517	708	925	1168	292	654	1063	1496	1966	2472	3014
31	100	220	361	527	720	939	1186	292	637	1058	1504	1986	2504	3059
32	103	225	369	537	732	954	1203	292	617	1039	1497	1991	2522	3089
33	105	230	376	547	745	969	1220	292	594	991	1461	1968	2511	3091
34	108	235	384	557	757	984	1238	292	584	954	1421	1940	2495	3087
35	110	240	391	567	769	999	1255	292	584	923	1355	1868	2436	3040
36	113	245	398	577	782	1014	1272	292	584	891	1285	1752	2310	2926
37	115	250	406	587	794	1028	1289	292	584	877	1230	1649	2151	2755
38	118	254	413	596	806	1043	1307	292	584	877	1187	1555	1999	2536
39	120	259	421	606	819	1058	1324	292	584	877	1169	1483	1866	2334
40	122	264	428	616	831	1073	1341	292	584	877	1169	1461	1780	2177

Figure C.09.a: Table of HRRs of Contained Transient & 1.5 ft. Cable Tray Fires

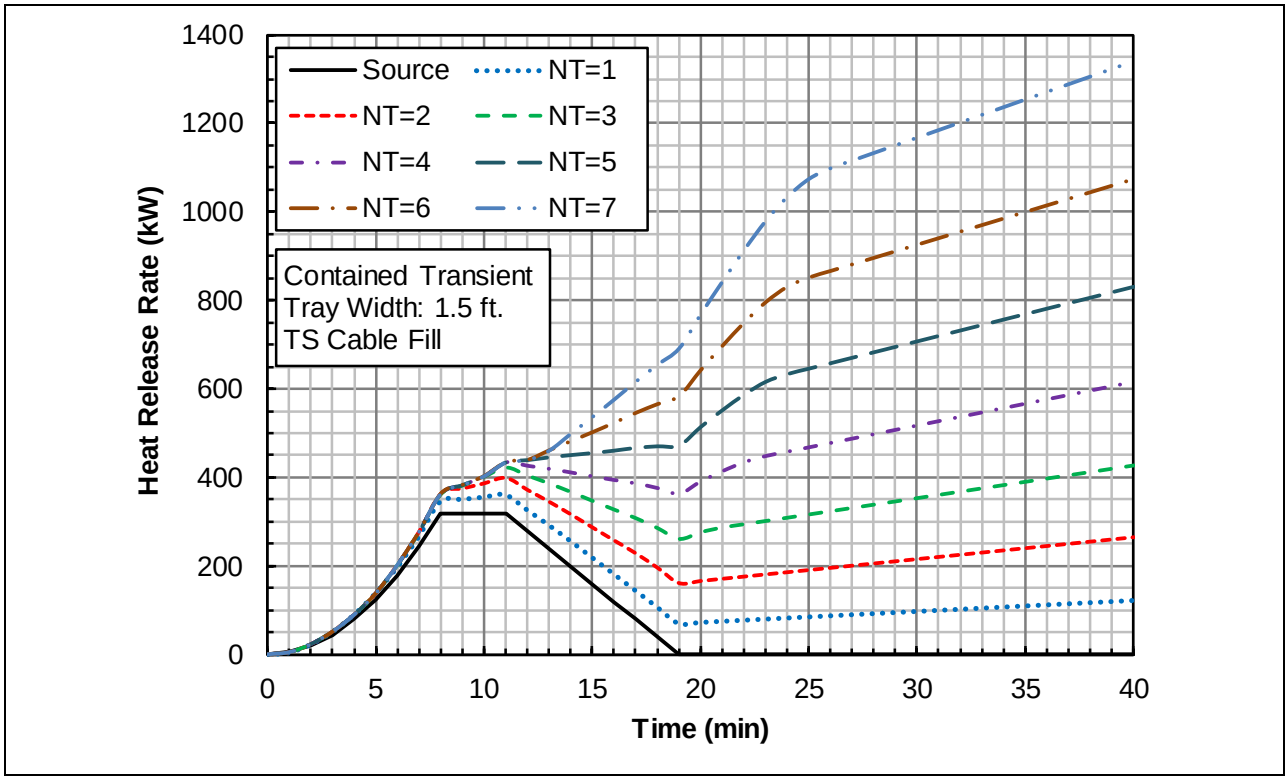

Figure C.09.b: HRR Plots of Contained Transient & 1.5 ft. TS Cable Tray Fires

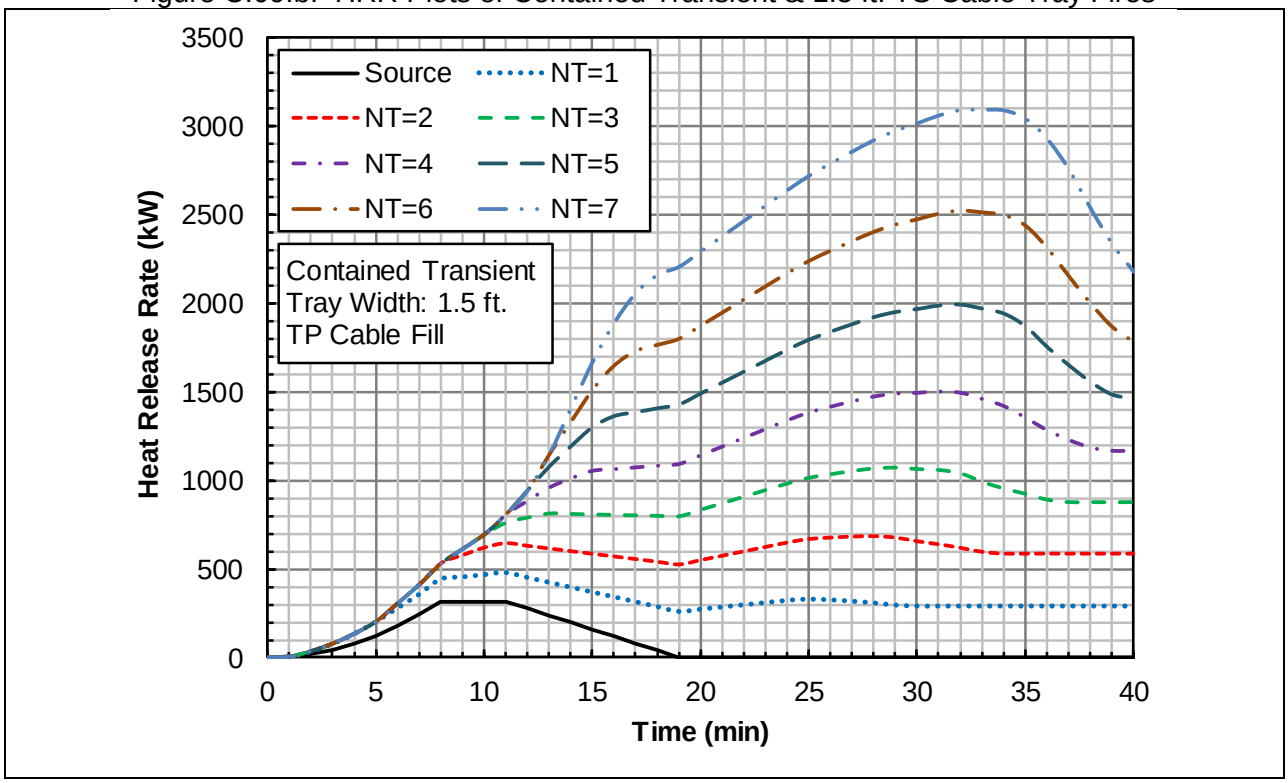

Figure C.09.c: HRR Plots of Contained Transient & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2	27	27	27	27	27	27	27	52	52	52	52	52	52	52
3	59	59	59	59	59	59	59	113	113	113	113	113	113	113
4	101	101	101	101	101	101	101	190	190	190	190	190	190	190
5	154	154	154	154	154	154	154	282	282	282	282	282	282	282
6	217	228	228	228	228	228	228	382	434	434	434	434	434	434
7	290	314	314	314	314	314	314	471	581	581	581	581	581	581
8	374	410	410	410	410	410	410	570	742	742	742	742	742	742
9	383	432	448	448	448	448	448	594	835	908	908	908	908	908
10	393	455	489	489	489	489	489	619	920	1071	1071	1071	1071	1071
11	404	480	530	551	551	551	551	644	969	1204	1298	1298	1298	1298
12	375	465	533	575	601	601	601	629	979	1302	1495	1609	1609	1609
13	347	451	537	601	653	683	683	614	989	1387	1684	1917	2052	2052
14	315	434	538	624	703	764	799	599	998	1421	1827	2186	2461	2616
15	280	414	537	646	752	844	915	584	1008	1456	1952	2440	2860	3177
16	245	395	537	669	802	927	1033	569	1018	1490	2011	2605	3175	3657
17	211	376	538	694	854	1011	1154	554	1028	1525	2070	2688	3379	4033
18	176	351	532	712	901	1090	1270	539	1037	1559	2129	2772	3488	4277
19	141	321	523	727	944	1166	1384	524	1047	1594	2188	2856	3596	4410
20	146	331	554	782	1028	1284	1539	549	1097	1668	2287	2979	3745	4583
21	151	341	575	828	1104	1393	1686	574	1146	1742	2386	3103	3893	4755
22	156	351	590	869	1174	1497	1828	598	1195	1816	2485	3226	4041	4928
23	161	361	604	897	1232	1590	1960	623	1245	1890	2583	3350	4189	5101
24	166	371	619	916	1267	1660	2069	648	1294	1964	2682	3473	4337	5274
25	171	381	634	936	1292	1701	2150	662	1334	2028	2771	3587	4475	5437
26	176	390	649	956	1317	1731	2199	654	1349	2069	2836	3677	4590	5576
27	181	400	664	976	1341	1760	2233	639	1360	2104	2896	3761	4699	5710
28	186	410	678	995	1366	1790	2268	620	1365	2134	2951	3841	4804	5839
29	191	420	693	1015	1391	1820	2302	596	1349	2142	2984	3898	4886	5946
30	196	430	708	1035	1415	1849	2337	584	1308	2126	2992	3932	4944	6029
31	201	440	723	1055	1440	1879	2372	584	1273	2116	3007	3971	5008	6118
32	205	450	738	1074	1465	1909	2406	584	1234	2077	2993	3982	5043	6178
33	210	460	753	1094	1489	1938	2441	584	1188	1982	2923	3936	5022	6181
34	215	469	767	1114	1514	1968	2475	584	1169	1907	2842	3880	4991	6175
35	220	479	782	1134	1539	1997	2510	584	1169	1847	2711	3736	4872	6080
36	225	489	797	1153	1563	2027	2544	584	1169	1781	2569	3504	4620	5853
37	230	499	812	1173	1588	2057	2579	584	1169	1753	2460	3298	4302	5509
38	235	509	827	1193	1613	2086	2613	584	1169	1753	2374	3110	3997	5072
39	240	519	841	1213	1638	2116	2648	584	1169	1753	2338	2967	3732	4668
40	245	529	856	1232	1662	2146	2683	584	1169	1753	2338	2922	3559	4353

Figure C.10.a: Table of HRRs of Contained Transient & 3.0 ft. Cable Tray Fires

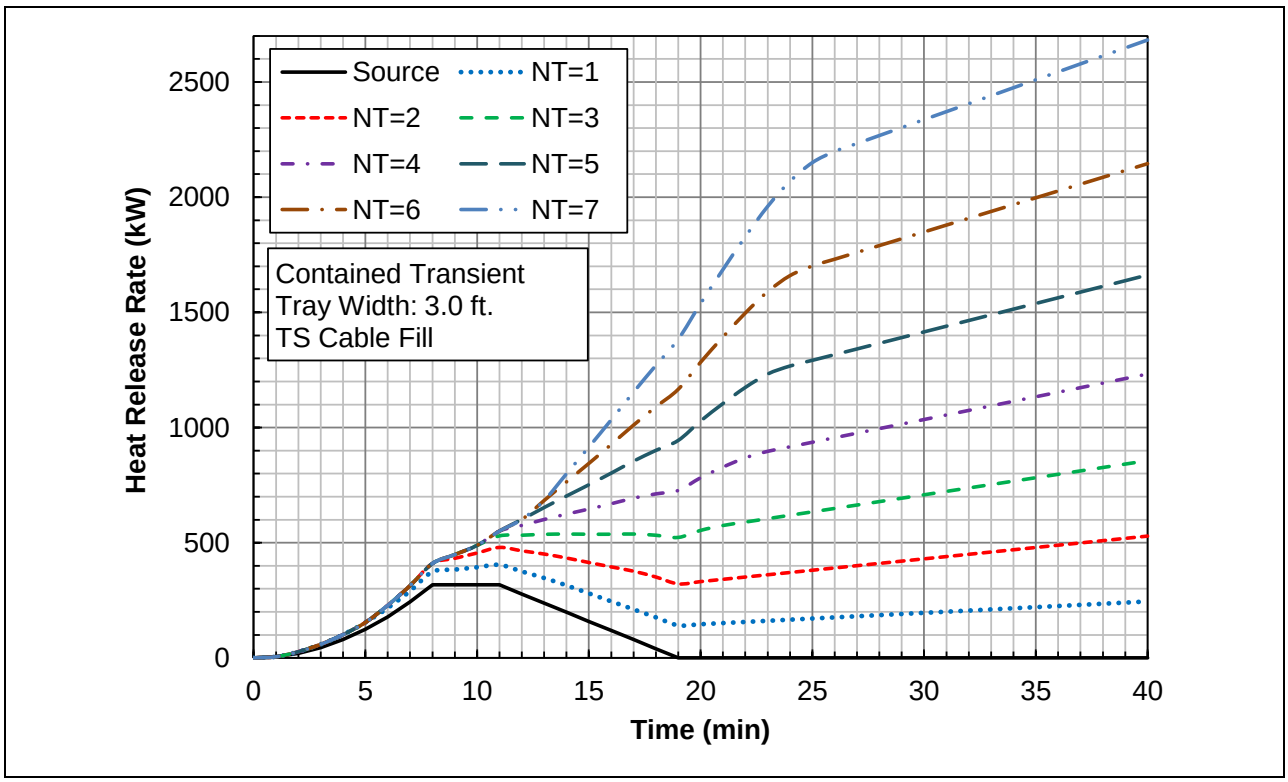

Figure C.10.b: HRR Plots of Contained Transient & 3.0 ft. TS Cable Tray Fires

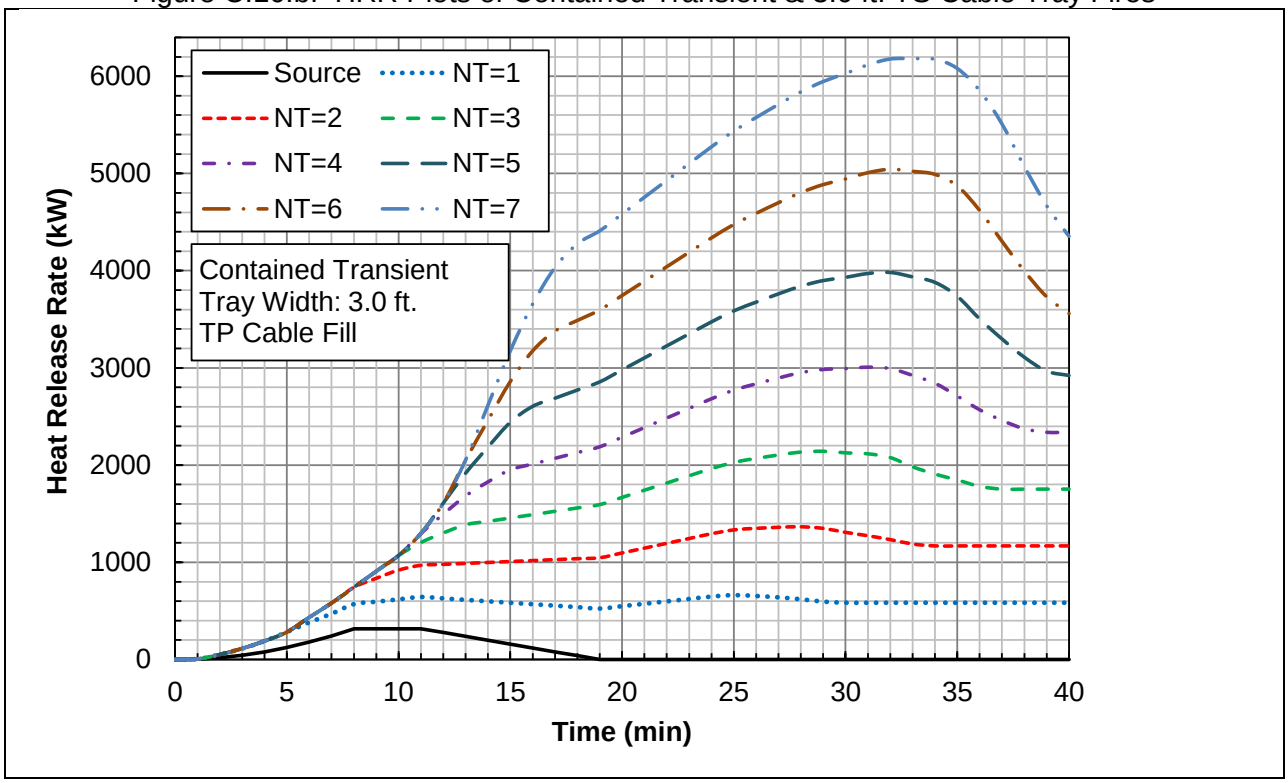

Figure C.10.c: HRR Plots of Contained Transient & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3	3	3	3	3	3	3	9	9	9	9	9	9	9
3	6	6	6	6	6	6	6	21	21	21	21	21	21	21
4	10	10	10	10	10	10	10	37	37	37	37	37	37	37
5	16	16	16	16	16	16	16	55	55	55	55	55	55	55
6	21	25	25	25	25	25	25	75	94	94	94	94	94	94
7	28	36	36	36	36	36	36	92	131	131	131	131	131	131
8	36	48	48	48	48	48	48	109	171	171	171	171	171	171
9	44	61	67	67	67	67	67	126	215	244	244	244	244	244
10	53	75	88	88	88	88	88	145	258	317	317	317	317	317
11	63	90	110	118	118	118	118	164	289	382	421	421	421	421
12	74	106	133	150	161	161	161	183	321	451	531	580	580	580
13	78	115	149	176	198	212	212	196	345	507	632	733	792	792
14	81	124	165	201	235	262	278	208	370	544	715	871	992	1062
15	83	132	181	226	272	313	345	220	395	581	792	1004	1190	1333
16	86	141	197	252	310	365	413	233	419	618	841	1100	1354	1571
17	88	149	214	279	348	417	482	245	444	655	890	1162	1470	1765
18	91	156	228	304	385	469	550	257	469	692	940	1224	1544	1901
19	93	161	242	327	421	520	617	270	494	729	989	1285	1618	1987
20	96	166	255	351	458	571	686	282	518	766	1039	1347	1692	2074
21	96	168	263	369	489	617	749	292	541	801	1086	1407	1764	2158
22	96	171	268	385	518	662	811	302	563	836	1133	1466	1836	2242
23	96	174	273	397	543	701	868	312	586	871	1180	1526	1908	2326
24	96	176	278	404	557	731	916	322	608	905	1227	1585	1979	2410
25	97	179	283	412	567	749	952	330	628	938	1272	1642	2049	2492
26	97	182	288	419	577	762	973	331	642	964	1310	1693	2112	2568
27	97	184	294	427	587	774	988	330	653	987	1346	1741	2172	2640
28	97	187	299	435	597	787	1003	326	661	1008	1379	1786	2230	2710
29	98	190	304	442	608	800	1018	319	661	1020	1404	1823	2279	2772
30	98	192	309	450	618	812	1033	315	650	1021	1417	1849	2317	2822
31	98	195	314	458	628	825	1048	312	638	1022	1430	1874	2355	2872
32	98	198	319	465	638	837	1063	310	624	1011	1431	1888	2381	2911
33	98	201	324	473	648	850	1079	308	607	977	1409	1879	2384	2926
34	99	203	330	480	658	862	1094	306	598	948	1381	1862	2380	2934
35	99	206	335	488	668	875	1109	303	596	924	1329	1806	2337	2903
36	99	209	340	496	678	887	1124	301	593	896	1271	1712	2235	2814
37	99	211	345	503	688	900	1139	299	591	883	1226	1626	2101	2669
38	100	214	350	511	698	913	1154	297	589	881	1188	1545	1970	2480
39	100	217	355	519	708	925	1169	294	587	879	1171	1482	1854	2303
40	100	219	361	526	719	938	1184	292	584	877	1169	1461	1776	2162

Figure C.11.a: Table of HRRs of Small Enclosure & 1.5 ft. Cable Tray Fires

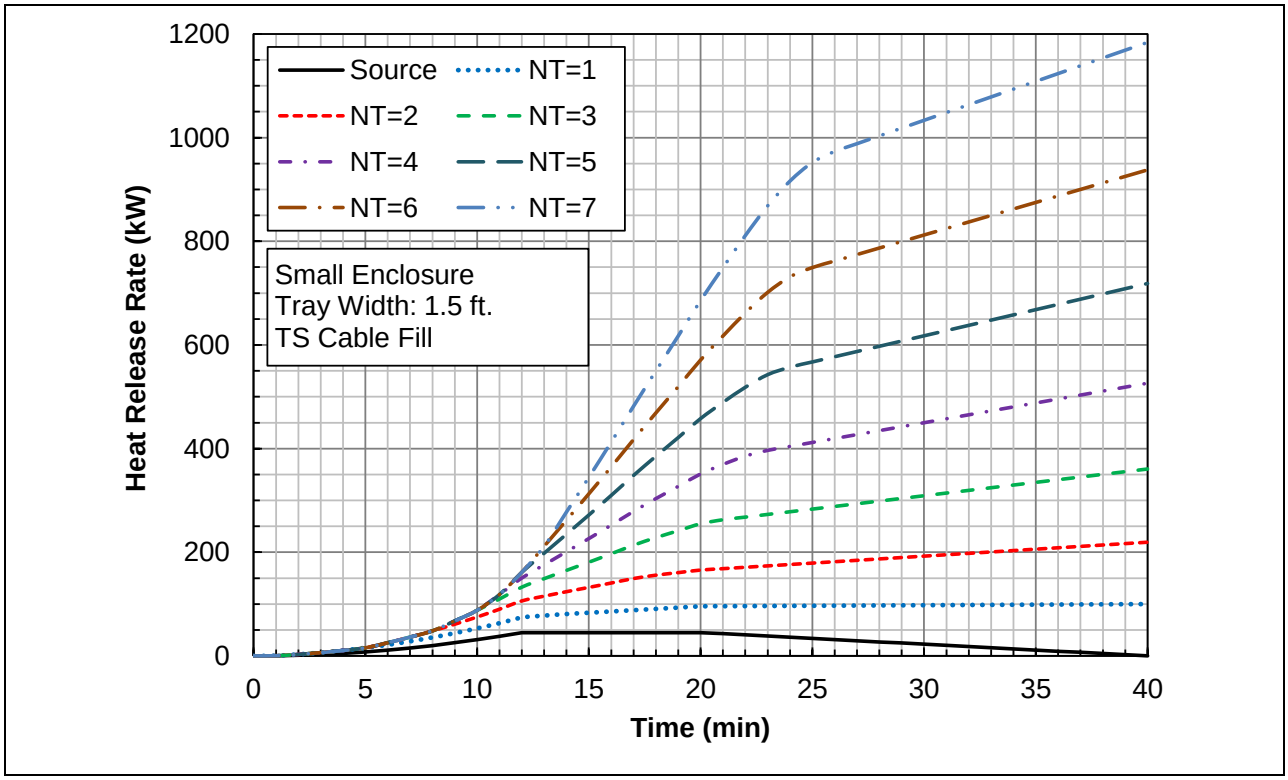

Figure C.11.b: HRR Plots of Small Enclosure & 1.5 ft. TS Cable Tray Fires

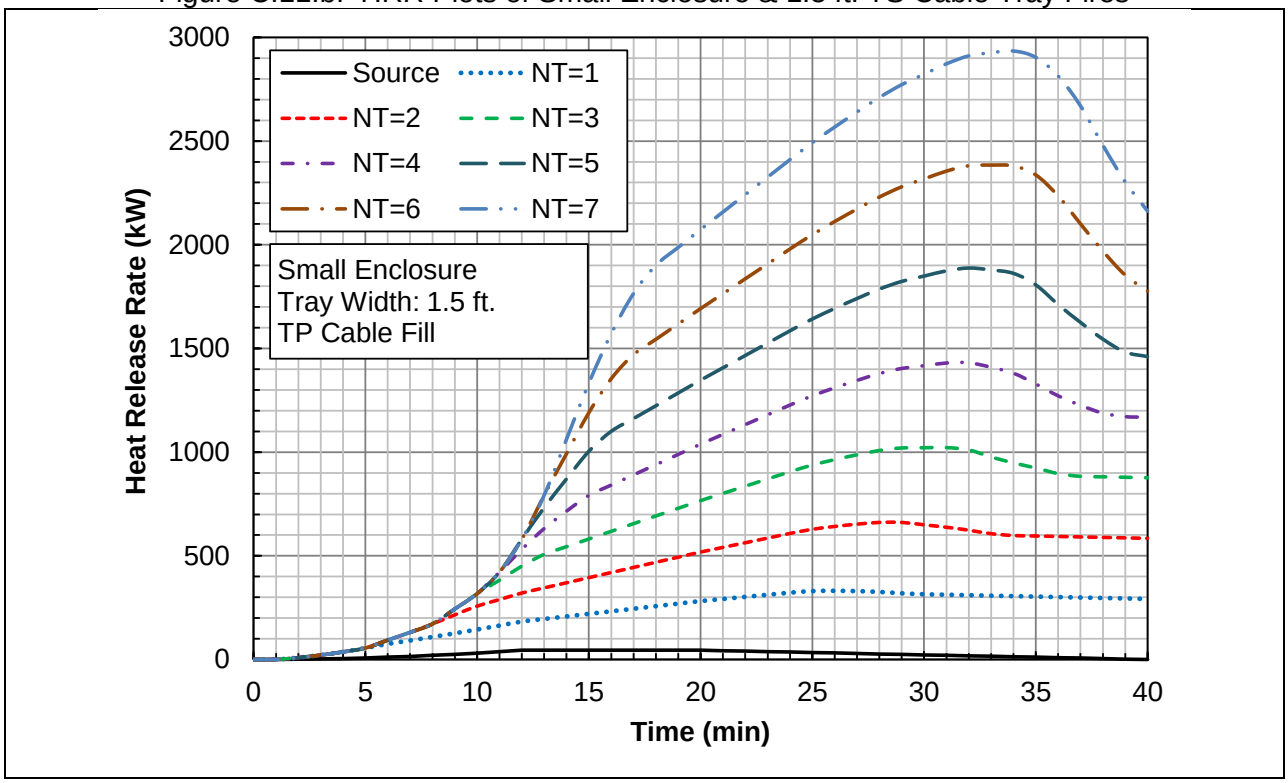

Figure C.11.c: HRR Plots of Small Enclosure & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	5	5	5	5	5	5	5	17	17	17	17	17	17	17
3	10	10	10	10	10	10	10	40	40	40	40	40	40	40
4	16	16	16	16	16	16	16	69	69	69	69	69	69	69
5	23	23	23	23	23	23	23	103	103	103	103	103	103	103
6	32	40	40	40	40	40	40	139	176	176	176	176	176	176
7	41	57	57	57	57	57	57	168	247	247	247	247	247	247
8	51	76	76	76	76	76	76	198	323	323	323	323	323	323
9	63	97	110	110	110	110	110	228	405	462	462	462	462	462
10	75	119	145	145	145	145	145	258	484	604	604	604	604	604
11	88	142	182	199	199	199	199	289	540	727	805	805	805	805
12	103	167	220	256	278	278	278	321	596	856	1017	1116	1116	1116
13	110	185	253	306	351	378	378	346	646	969	1218	1420	1539	1539
14	117	203	285	357	425	479	511	371	695	1043	1386	1697	1940	2079
15	122	219	317	408	499	581	644	395	745	1117	1538	1963	2336	2620
16	126	236	349	460	574	684	780	420	794	1191	1637	2156	2663	3097
17	131	254	382	513	651	790	919	445	843	1265	1736	2279	2895	3485
18	136	266	411	562	725	893	1055	469	893	1340	1835	2402	3043	3757
19	141	276	438	609	798	994	1190	494	942	1414	1933	2526	3191	3930
20	146	286	465	657	871	1097	1327	519	991	1488	2032	2649	3339	4102
21	149	294	482	696	936	1192	1456	541	1039	1559	2129	2770	3485	4273
22	152	301	495	730	996	1283	1581	564	1086	1631	2225	2892	3631	4444
23	154	309	508	755	1047	1364	1698	586	1133	1703	2322	3013	3777	4614
24	157	317	520	772	1078	1427	1796	609	1180	1775	2418	3134	3923	4785
25	160	324	533	790	1101	1465	1870	626	1222	1842	2510	3251	4064	4951
26	162	332	545	807	1123	1492	1915	631	1252	1896	2589	3354	4192	5104
27	165	340	558	825	1145	1520	1947	631	1276	1945	2662	3452	4315	5251
28	168	347	570	842	1168	1547	1980	625	1295	1989	2731	3545	4433	5394
29	170	355	583	860	1190	1574	2012	614	1297	2016	2782	3622	4534	5519
30	173	362	596	877	1213	1602	2044	607	1277	2020	2811	3675	4612	5622
31	176	370	608	895	1235	1629	2077	605	1256	2023	2839	3728	4690	5725
32	178	378	621	912	1258	1656	2109	602	1229	2003	2844	3758	4744	5803
33	181	385	633	930	1280	1684	2141	600	1198	1938	2803	3741	4752	5836
34	184	393	646	947	1302	1711	2174	598	1182	1883	2748	3711	4746	5855
35	187	401	658	965	1325	1739	2206	596	1180	1836	2646	3602	4662	5796
36	189	408	671	982	1347	1766	2238	593	1178	1784	2534	3414	4461	5619
37	192	416	683	1000	1370	1793	2271	591	1176	1760	2445	3244	4195	5332
38	195	423	696	1017	1392	1821	2303	589	1173	1758	2372	3086	3935	4955
39	197	431	709	1035	1415	1848	2335	587	1171	1755	2340	2962	3705	4604
40	200	439	721	1052	1437	1876	2368	584	1169	1753	2338	2922	3553	4325

Figure C.12.a: Table of HRRs of Small Enclosure & 3.0 ft. Cable Tray Fires

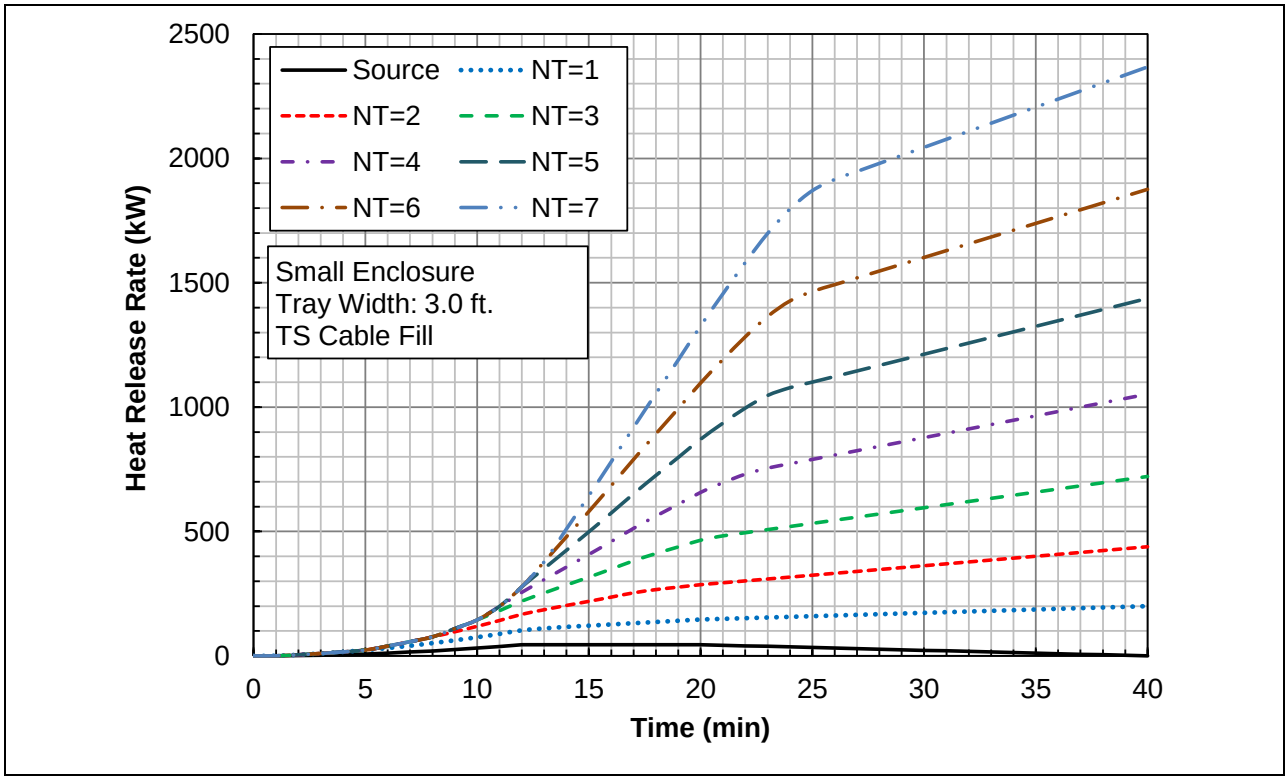

Figure C.12.b: HRR Plots of Small Enclosure & 3.0 ft. TS Cable Tray Fires

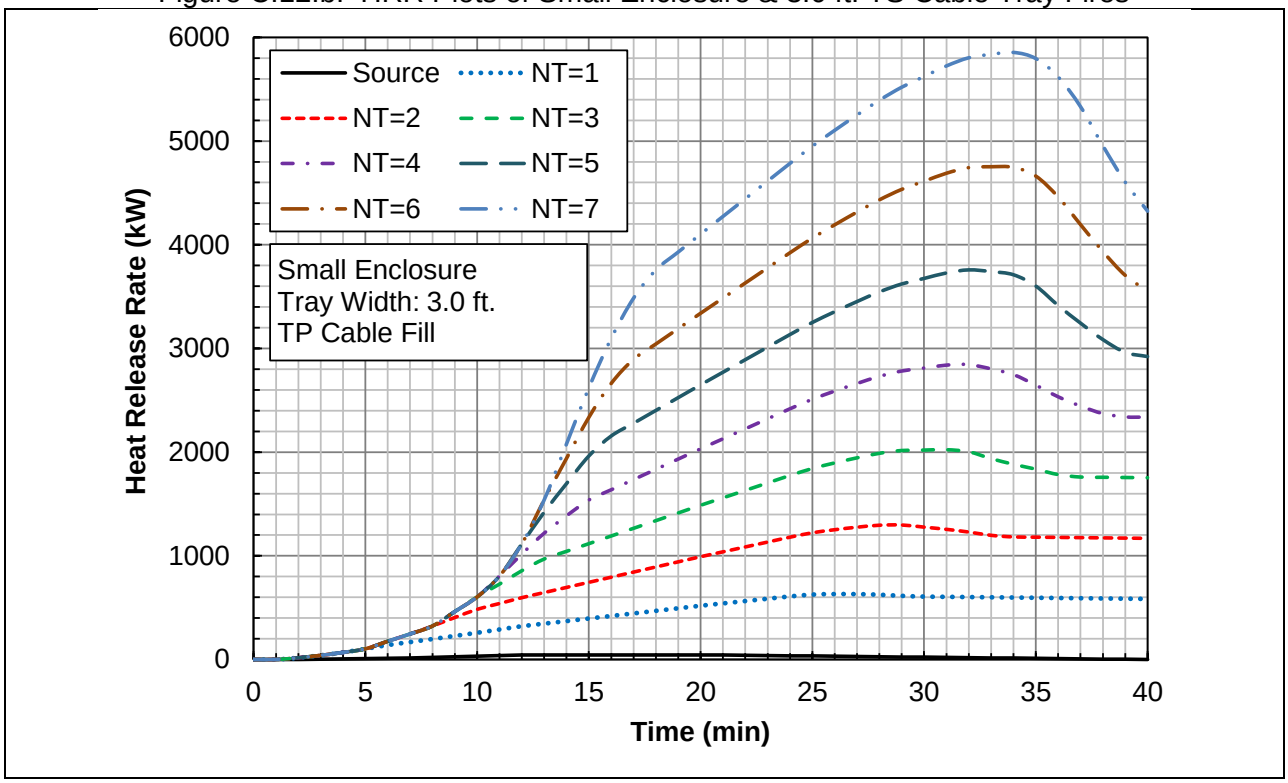

Figure C.12.c: HRR Plots of Small Enclosure & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	6	6	6	6	6	6	6	15	15	15	15	15	15	15
3	13	13	13	13	13	13	13	34	34	34	34	34	34	34
4	22	22	22	22	22	22	22	57	57	57	57	57	57	57
5	34	34	34	34	34	34	34	84	84	84	84	84	84	84
6	47	52	52	52	52	52	52	113	135	135	135	135	135	135
7	62	72	72	72	72	72	72	137	184	184	184	184	184	184
8	79	94	94	94	94	94	94	163	237	237	237	237	237	237
9	98	119	126	126	126	126	126	191	294	326	326	326	326	326
10	119	145	160	160	160	160	160	221	350	417	417	417	417	417
11	143	174	197	206	206	206	206	252	394	498	540	540	540	540
12	168	206	235	255	267	267	267	285	439	583	671	724	724	724
13	172	216	254	283	307	322	322	297	464	642	777	886	949	949
14	176	226	272	312	348	376	393	310	489	679	865	1031	1160	1233
15	178	235	290	339	388	431	465	322	513	716	944	1170	1367	1517
16	181	245	307	368	429	487	538	334	538	753	993	1269	1537	1765
17	183	254	326	397	471	544	612	347	563	790	1042	1331	1656	1965
18	186	261	341	423	511	599	684	359	587	828	1092	1392	1730	2103
19	188	266	356	448	549	653	756	371	612	865	1141	1454	1804	2190
20	191	271	370	474	588	708	828	384	637	902	1191	1516	1878	2276
21	187	269	374	489	617	752	891	390	655	932	1233	1571	1945	2356
22	183	268	374	502	644	795	952	395	673	963	1276	1626	2013	2436
23	179	266	375	509	665	832	1008	401	691	993	1319	1682	2080	2516
24	175	264	376	512	675	859	1053	407	710	1024	1362	1737	2148	2596
25	170	263	377	516	681	873	1086	409	724	1051	1401	1789	2212	2672
26	166	261	378	519	687	882	1103	403	730	1069	1432	1831	2267	2740
27	162	260	379	523	693	890	1114	394	733	1084	1460	1872	2320	2805
28	158	258	380	526	699	898	1125	382	734	1097	1485	1909	2370	2867
29	154	257	381	529	705	907	1136	368	725	1101	1501	1937	2410	2920
30	150	255	382	533	710	915	1146	357	704	1092	1505	1954	2439	2961
31	146	254	383	536	716	923	1157	351	685	1085	1510	1971	2469	3003
32	142	252	384	539	722	932	1168	344	663	1065	1502	1976	2486	3032
33	138	250	384	543	728	940	1179	338	638	1020	1469	1955	2478	3036
34	134	249	385	546	734	948	1189	331	623	982	1430	1928	2463	3034
35	130	247	386	550	740	957	1200	325	617	950	1367	1860	2407	2991
36	126	246	387	553	745	965	1211	318	610	915	1298	1751	2289	2885
37	122	244	388	556	751	973	1222	312	604	896	1243	1652	2139	2723
38	118	243	389	560	757	981	1233	305	597	890	1198	1560	1993	2515
39	114	241	390	563	763	990	1243	299	591	883	1175	1488	1864	2322
40	110	239	391	566	769	998	1254	292	584	877	1169	1461	1778	2169

Figure C.13.a: Table of HRRs of MCC/Battery Charger & 1.5 ft. Cable Tray Fires

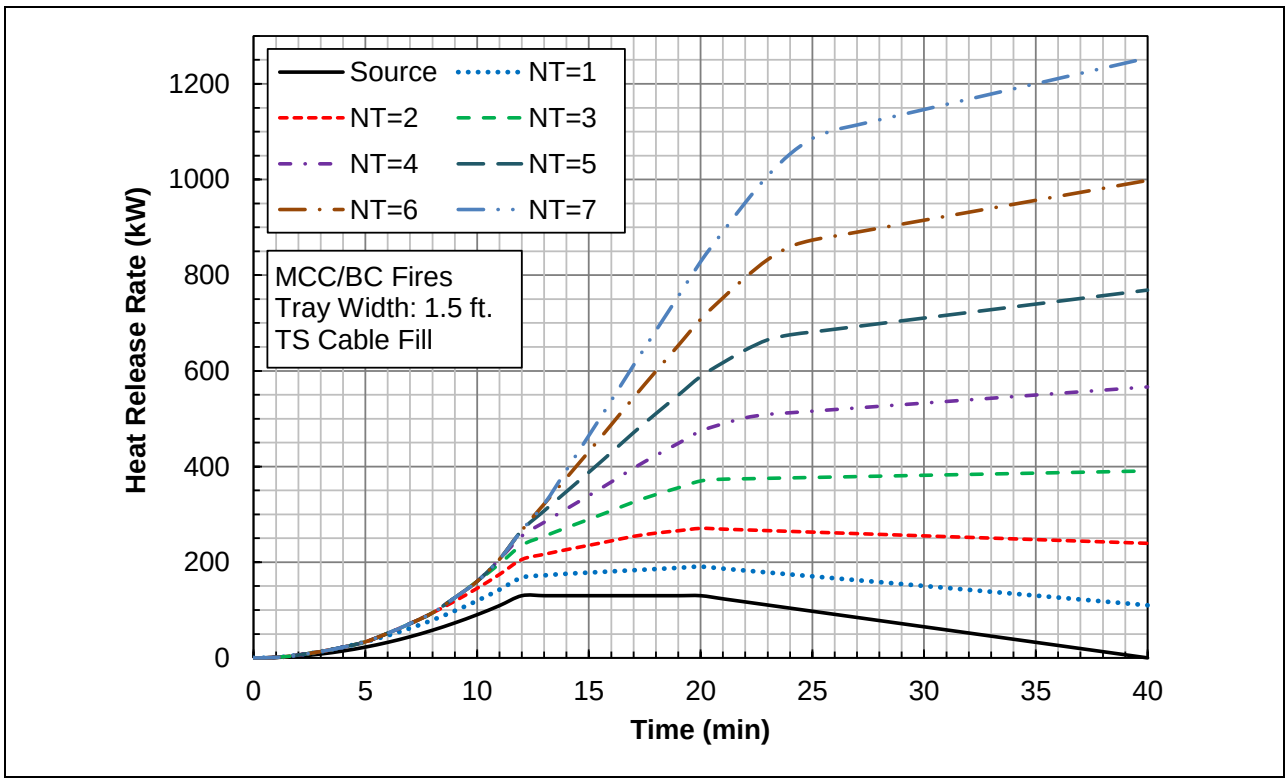

Figure C.13.b: HRR Plots of MCC/Battery Charger & 1.5 ft. TS Cable Tray Fires

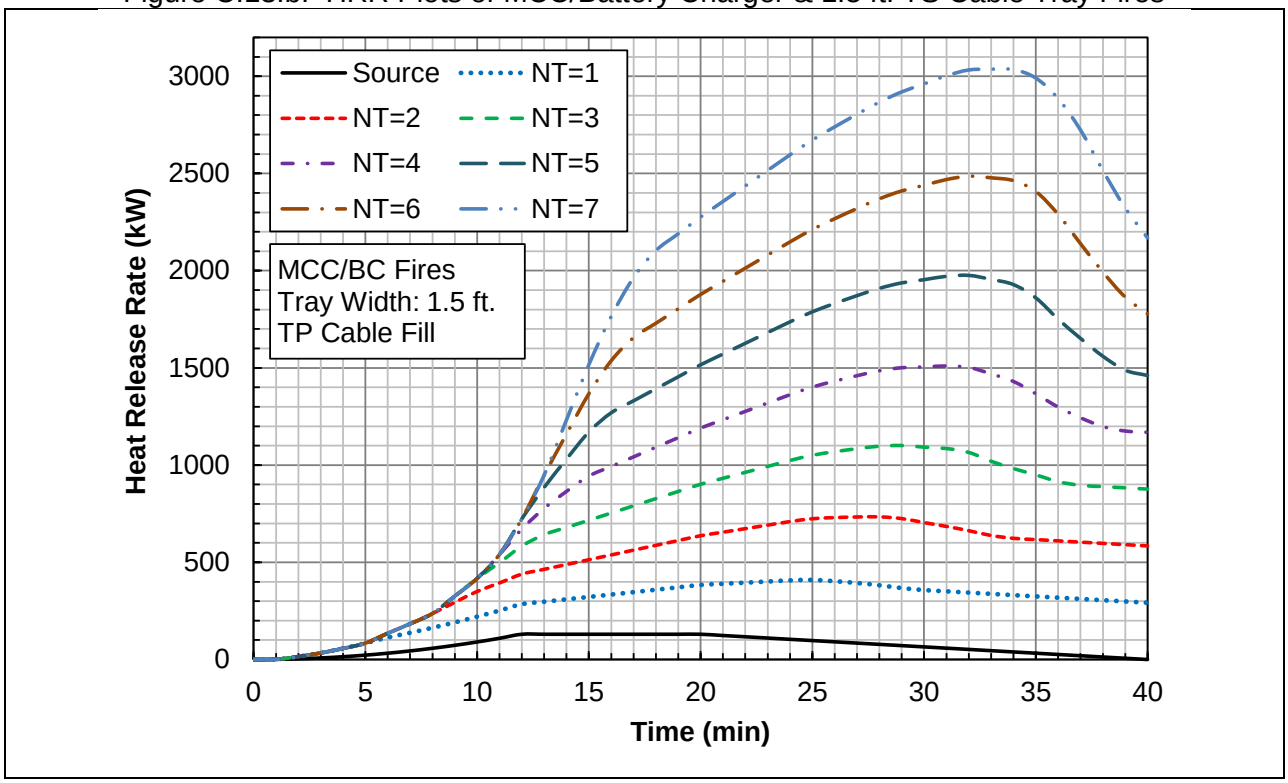

Figure C.13.c: HRR Plots of MCC/Battery Charger & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	8	8	8	8	8	8	8	27	27	27	27	27	27	27
3	18	18	18	18	18	18	18	59	59	59	59	59	59	59
4	30	30	30	30	30	30	30	99	99	99	99	99	99	99
5	45	45	45	45	45	45	45	146	146	146	146	146	146	146
6	61	71	71	71	71	71	71	194	238	238	238	238	238	238
7	80	99	99	99	99	99	99	231	323	323	323	323	323	323
8	100	130	130	130	130	130	130	269	415	415	415	415	415	415
9	123	164	179	179	179	179	179	309	515	579	579	579	579	579
10	149	201	230	230	230	230	230	351	610	744	744	744	744	744
11	176	240	284	303	303	303	303	394	678	887	972	972	972	972
12	206	281	341	379	403	403	403	440	748	1037	1212	1317	1317	1317
13	215	303	379	437	485	513	513	465	798	1155	1425	1641	1767	1767
14	222	322	414	493	566	623	656	489	847	1229	1600	1932	2189	2336
15	227	341	449	549	646	733	800	514	897	1303	1757	2211	2604	2903
16	232	359	485	605	728	844	945	539	946	1377	1856	2408	2944	3400
17	236	378	521	663	812	958	1093	563	995	1451	1955	2532	3181	3799
18	241	392	553	716	891	1068	1238	588	1045	1525	2054	2655	3329	4076
19	246	402	581	767	968	1176	1381	613	1094	1599	2152	2778	3477	4249
20	251	411	610	818	1046	1286	1526	637	1144	1673	2251	2902	3626	4422
21	250	415	624	855	1111	1381	1658	656	1186	1741	2343	3019	3767	4588
22	248	418	632	887	1170	1473	1786	674	1229	1808	2436	3136	3909	4755
23	247	422	640	908	1219	1554	1905	692	1272	1876	2528	3253	4050	4921
24	245	425	649	921	1247	1615	2002	710	1315	1943	2620	3370	4192	5087
25	243	428	657	934	1265	1649	2074	721	1351	2004	2705	3480	4327	5247
26	242	432	665	947	1283	1672	2115	715	1369	2047	2773	3572	4444	5388
27	240	435	673	961	1301	1695	2143	703	1382	2084	2835	3659	4555	5525
28	239	438	682	974	1319	1719	2171	686	1390	2117	2892	3740	4662	5656
29	237	442	690	987	1338	1742	2200	664	1378	2130	2930	3803	4749	5768
30	236	445	698	1000	1356	1765	2228	649	1343	2120	2945	3842	4813	5856
31	234	449	707	1014	1374	1788	2256	643	1311	2112	2962	3884	4879	5947
32	233	452	715	1027	1392	1811	2284	636	1273	2079	2953	3900	4920	6013
33	231	455	723	1040	1410	1834	2312	630	1230	1994	2893	3865	4910	6027
34	229	459	732	1053	1429	1857	2340	623	1208	1925	2821	3818	4887	6029
35	228	462	740	1067	1447	1881	2368	617	1201	1867	2701	3688	4782	5949
36	226	465	748	1080	1465	1904	2396	610	1195	1804	2571	3475	4553	5744
37	225	469	757	1093	1483	1927	2424	604	1188	1773	2467	3284	4259	5427
38	223	472	765	1106	1501	1950	2452	597	1182	1766	2383	3107	3973	5018
39	222	476	773	1120	1519	1973	2480	591	1175	1760	2344	2970	3722	4638
40	220	479	781	1133	1538	1996	2508	584	1169	1753	2338	2922	3556	4337

Figure C.14.a: Table of HRRs of MCC/Battery Charger & 3.0 ft. Cable Tray Fires

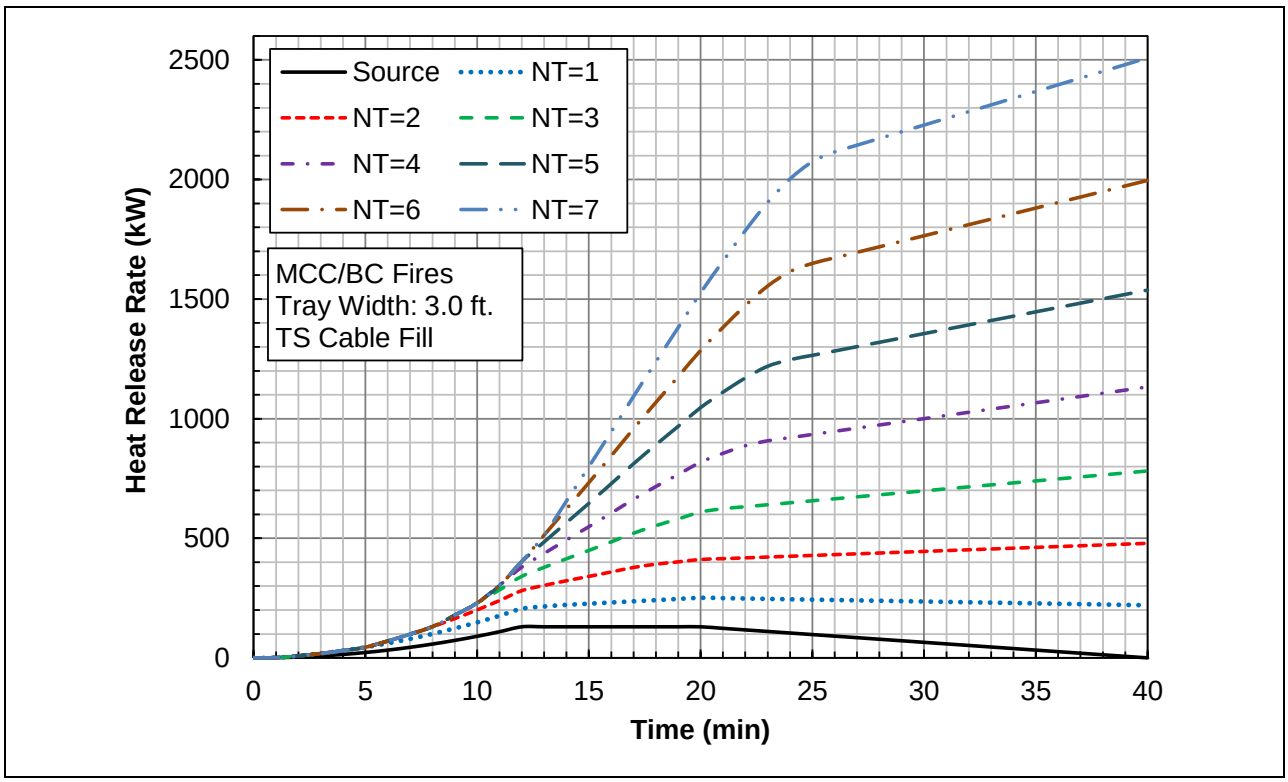

Figure C.14.b: HRR Plots of MCC/Battery Charger & 3.0 ft. TS Cable Tray Fires

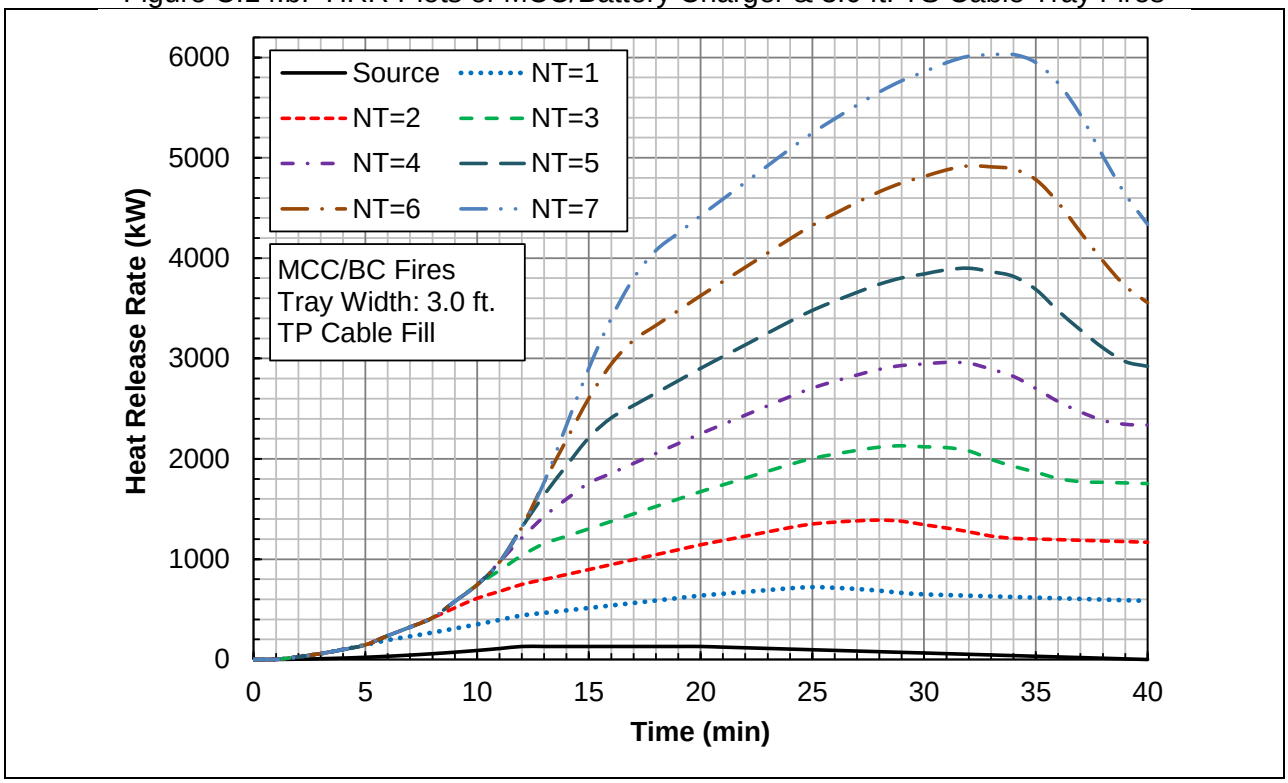

Figure C.14.c: HRR Plots of MCC/Battery Charger & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	7	7	7	7	7	7	7	17	17	17	17	17	17	17
3	16	16	16	16	16	16	16	39	39	39	39	39	39	39
4	28	28	28	28	28	28	28	65	65	65	65	65	65	65
5	42	42	42	42	42	42	42	96	96	96	96	96	96	96
6	58	63	63	63	63	63	63	129	152	152	152	152	152	152
7	77	87	87	87	87	87	87	157	205	205	205	205	205	205
8	99	115	115	115	115	115	115	187	263	263	263	263	263	263
9	123	144	152	152	152	152	152	219	327	360	360	360	360	360
10	150	177	192	192	192	192	192	254	389	458	458	458	458	458
11	179	212	235	245	245	245	245	291	438	546	590	590	590	590
12	211	250	281	301	313	313	313	330	490	639	729	783	783	783
13	216	262	301	331	355	370	370	343	515	699	837	948	1012	1012
14	219	272	319	360	397	426	443	355	540	736	926	1095	1226	1301
15	222	281	337	388	438	482	516	367	564	773	1006	1237	1437	1589
16	224	291	356	418	480	540	591	380	589	810	1055	1336	1609	1840
17	227	301	375	447	523	598	666	392	614	847	1104	1398	1728	2042
18	229	307	391	475	564	654	740	404	638	884	1154	1460	1803	2182
19	231	312	405	500	603	709	813	417	663	921	1203	1522	1877	2268
20	234	317	420	526	643	765	887	429	688	958	1252	1583	1951	2354
21	228	314	421	540	671	808	949	433	704	987	1293	1637	2016	2432
22	222	310	420	551	696	850	1009	437	720	1015	1334	1690	2082	2510
23	216	307	419	556	715	886	1063	441	736	1044	1375	1743	2147	2588
24	210	303	418	558	724	911	1108	445	752	1072	1416	1796	2213	2666
25	204	299	417	559	728	923	1139	444	765	1097	1453	1846	2275	2740
26	198	296	416	560	731	929	1154	435	767	1112	1480	1885	2327	2804
27	192	292	415	562	735	936	1163	422	767	1124	1505	1922	2376	2866
28	186	289	414	563	739	942	1172	408	765	1134	1527	1957	2423	2925
29	180	285	413	564	743	948	1181	390	752	1134	1539	1981	2460	2975
30	174	282	412	566	747	955	1189	377	728	1122	1540	1994	2485	3012
31	168	278	410	567	751	961	1198	369	705	1112	1542	2008	2512	3051
32	162	275	409	569	755	967	1207	360	680	1088	1531	2010	2525	3077
33	156	271	408	570	758	974	1216	352	652	1038	1493	1985	2512	3077
34	150	267	407	571	762	980	1224	343	635	997	1450	1954	2494	3071
35	143	264	406	573	766	986	1233	335	627	961	1382	1881	2434	3022
36	137	260	405	574	770	993	1242	326	618	923	1310	1766	2310	2911
37	131	257	404	575	774	999	1251	318	610	902	1251	1662	2153	2743
38	125	253	403	577	778	1005	1260	309	601	894	1203	1566	2002	2528
39	119	250	402	578	781	1012	1268	301	593	885	1177	1491	1868	2329
40	113	246	401	580	785	1018	1277	292	584	877	1169	1461	1778	2171

Figure C.15.a: Table of HRRs of Switchgear/Load Center & 1.5 ft. Cable Tray Fires

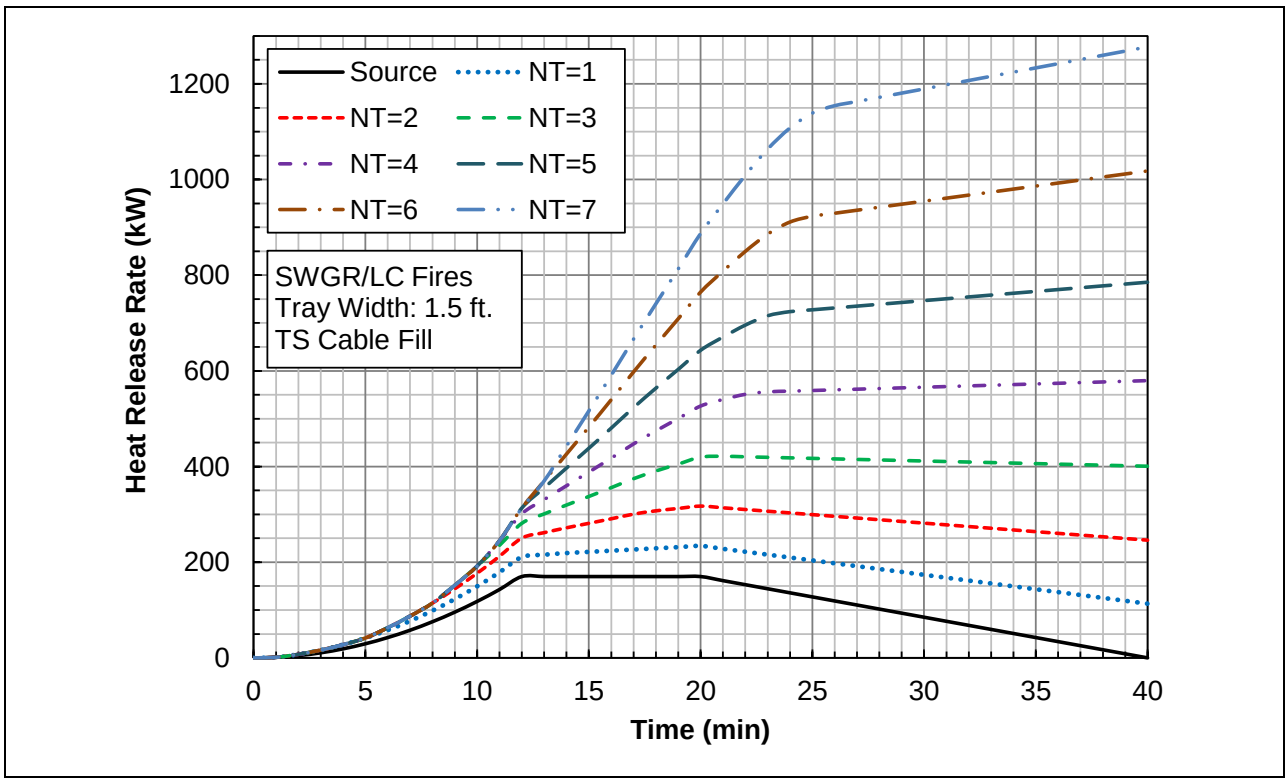

Figure C.15.b: HRR Plots of Switchgear/Load Center & 1.5 ft. TS Cable Tray Fires

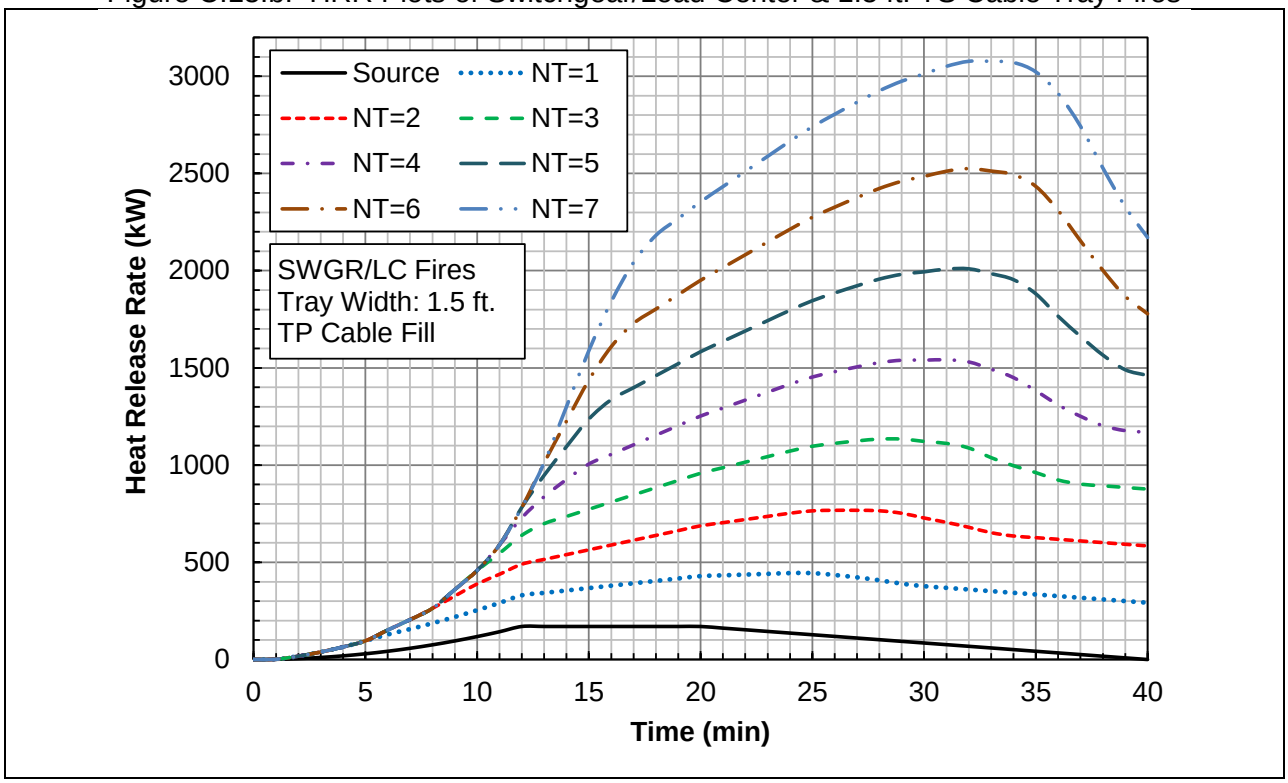

Figure C.15.c: HRR Plots of Switchgear/Load Center & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	10	10	10	10	10	10	10	30	30	30	30	30	30	30
3	22	22	22	22	22	22	22	67	67	67	67	67	67	67
4	36	36	36	36	36	36	36	111	111	111	111	111	111	111
5	54	54	54	54	54	54	54	162	162	162	162	162	162	162
6	74	84	84	84	84	84	84	215	261	261	261	261	261	261
7	96	117	117	117	117	117	117	255	352	352	352	352	352	352
8	122	153	153	153	153	153	153	298	451	451	451	451	451	451
9	150	193	208	208	208	208	208	342	558	624	624	624	624	624
10	181	236	266	266	266	266	266	389	660	798	798	798	798	798
11	215	282	328	347	347	347	347	439	734	949	1036	1036	1036	1036
12	251	331	393	432	457	457	457	491	810	1108	1288	1395	1395	1395
13	261	354	432	492	541	570	570	516	860	1228	1505	1726	1854	1854
14	268	374	469	550	624	682	716	540	909	1302	1682	2021	2283	2432
15	273	393	505	607	706	795	863	565	959	1376	1841	2304	2705	3008
16	278	412	542	665	791	909	1012	590	1008	1450	1940	2503	3048	3511
17	283	431	579	725	876	1025	1163	614	1057	1524	2039	2626	3287	3914
18	288	445	611	779	958	1138	1311	639	1107	1598	2137	2750	3435	4193
19	293	455	640	831	1036	1248	1456	664	1156	1672	2236	2873	3583	4366
20	298	465	669	883	1116	1359	1604	688	1205	1746	2335	2997	3731	4539
21	294	466	681	919	1180	1455	1736	705	1246	1812	2425	3112	3871	4703
22	291	467	688	949	1238	1546	1864	721	1287	1877	2516	3227	4011	4868
23	287	469	694	968	1286	1627	1982	737	1328	1943	2606	3342	4150	5032
24	284	470	700	979	1312	1686	2079	753	1369	2008	2696	3457	4290	5196
25	280	471	707	990	1328	1719	2150	761	1402	2066	2778	3564	4422	5353
26	277	473	713	1002	1344	1740	2189	751	1416	2105	2842	3652	4534	5490
27	273	474	719	1013	1360	1761	2216	734	1424	2138	2900	3734	4642	5622
28	269	476	726	1024	1376	1782	2242	713	1428	2166	2952	3812	4744	5749
29	266	477	732	1035	1393	1803	2268	687	1411	2174	2985	3869	4826	5856
30	262	478	738	1047	1409	1824	2294	669	1371	2159	2994	3903	4885	5939
31	259	480	744	1058	1425	1846	2320	661	1334	2147	3007	3940	4947	6026
32	255	481	751	1069	1441	1867	2346	652	1292	2108	2993	3951	4982	6086
33	252	482	757	1080	1457	1888	2372	644	1245	2017	2927	3910	4965	6094
34	248	484	763	1092	1473	1909	2398	635	1220	1943	2849	3857	4937	6090
35	244	485	770	1103	1490	1930	2424	627	1211	1880	2722	3719	4825	6002
36	241	487	776	1114	1506	1951	2450	618	1203	1813	2585	3497	4585	5788
37	237	488	782	1125	1522	1972	2476	610	1194	1779	2477	3299	4281	5460
38	234	489	789	1137	1538	1993	2502	601	1186	1770	2388	3115	3987	5040
39	230	491	795	1148	1554	2015	2528	593	1177	1762	2346	2973	3728	4650
40	227	492	801	1159	1571	2036	2554	584	1169	1753	2338	2922	3557	4342

Figure C.16.a: Table of HRRs of Switchgear/Load Center & 3.0 ft. Cable Tray Fires

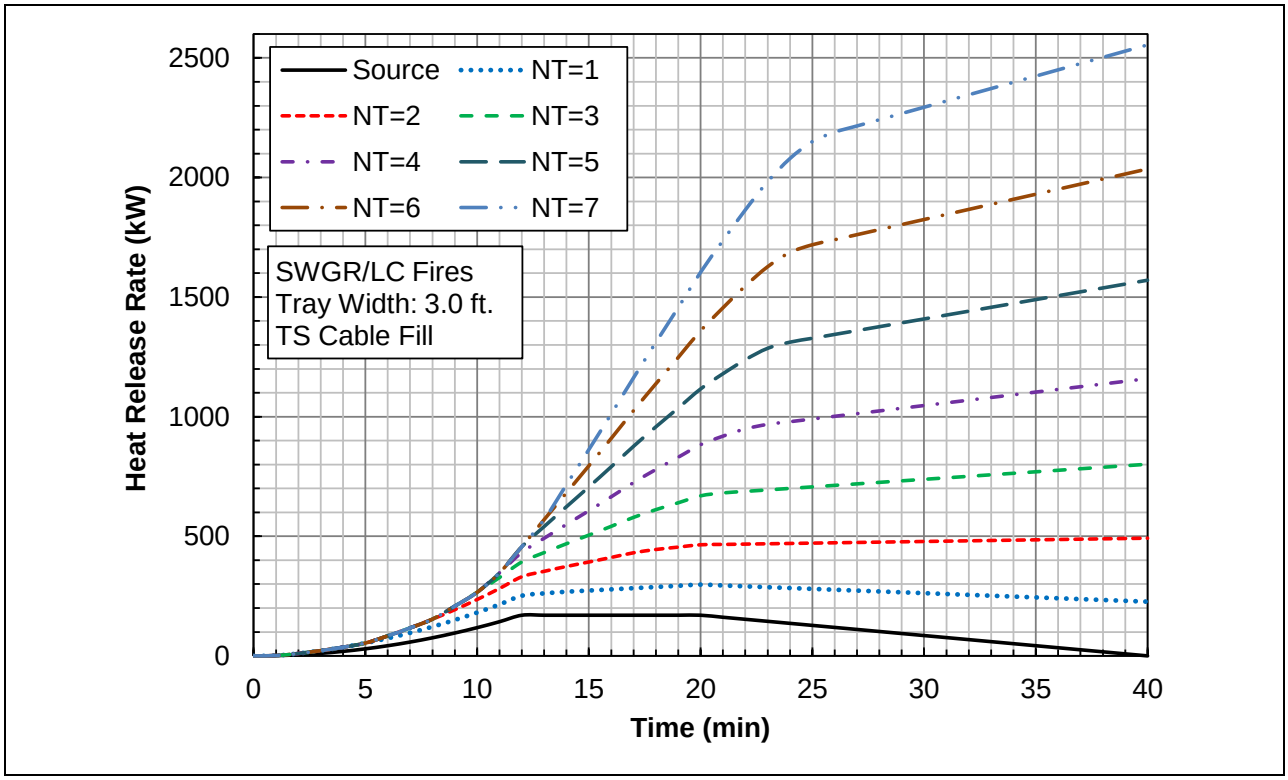

Figure C.16.b: HRR Plots of Switchgear/Load Center & 3.0 ft. TS Cable Tray Fires

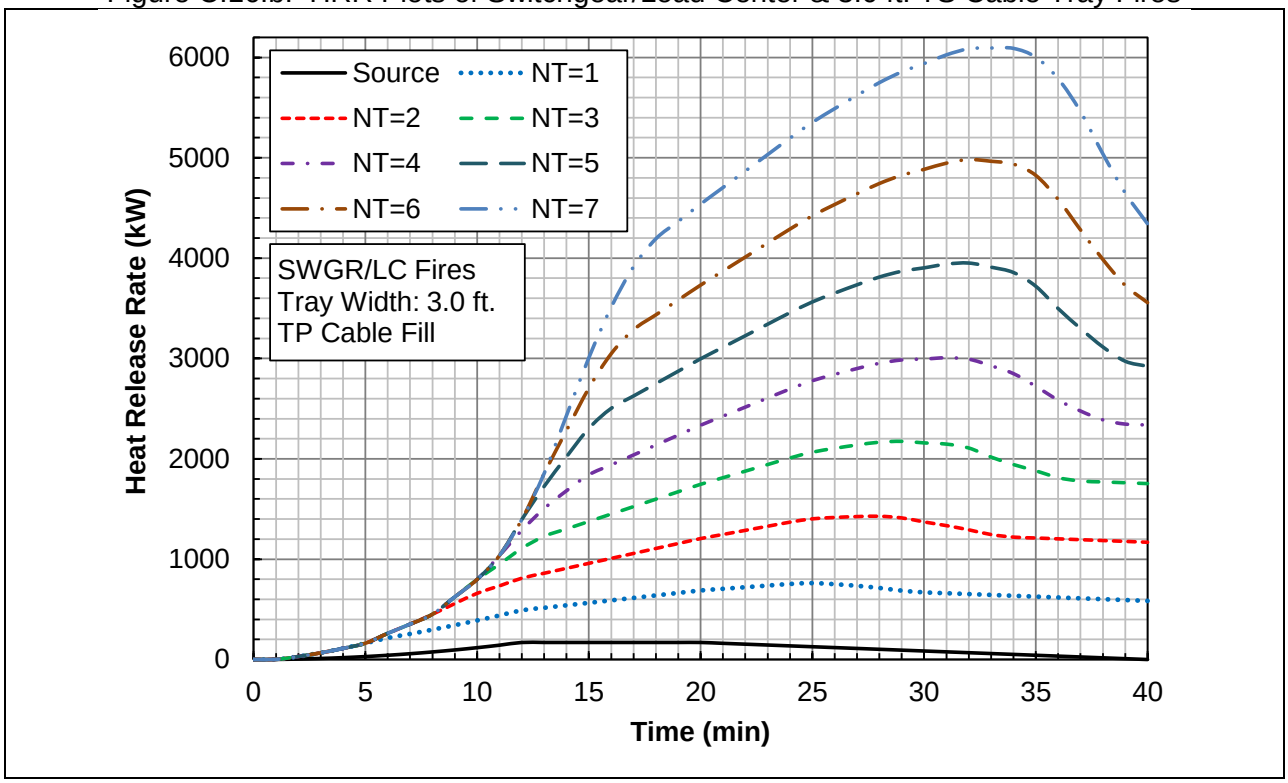

Figure C.16.c: HRR Plots of Switchgear/Load Center & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	8	8	8	8	8	8	8	19	19	19	19	19	19	19
3	18	18	18	18	18	18	18	42	42	42	42	42	42	42
4	31	31	31	31	31	31	31	70	70	70	70	70	70	70
5	47	47	47	47	47	47	47	104	104	104	104	104	104	104
6	66	72	72	72	72	72	72	140	164	164	164	164	164	164
7	88	99	99	99	99	99	99	170	220	220	220	220	220	220
8	113	130	130	130	130	130	130	204	283	283	283	283	283	283
9	141	163	171	171	171	171	171	239	350	384	384	384	384	384
10	172	200	216	216	216	216	216	278	417	488	488	488	488	488
11	206	240	264	274	274	274	274	320	471	581	625	625	625	625
12	243	284	315	335	348	348	348	364	527	679	771	825	825	825
13	248	295	335	366	391	405	405	376	552	740	881	993	1058	1058
14	251	306	354	395	433	463	480	389	577	777	970	1142	1274	1349
15	254	315	373	424	475	520	554	401	602	814	1050	1284	1487	1640
16	256	325	391	454	518	578	629	413	626	851	1099	1385	1660	1894
17	259	335	410	484	561	637	706	426	651	888	1149	1446	1780	2097
18	261	342	427	512	603	694	781	438	676	925	1198	1508	1854	2237
19	264	347	441	538	642	749	855	450	700	962	1248	1570	1928	2323
20	266	352	456	565	683	806	929	463	725	999	1297	1631	2002	2410
21	259	347	456	577	709	849	991	465	740	1026	1336	1683	2066	2486
22	251	342	454	587	733	889	1050	467	754	1053	1376	1735	2131	2563
23	244	336	451	590	751	924	1103	470	769	1080	1415	1787	2195	2639
24	236	331	449	590	759	948	1147	472	784	1107	1454	1838	2259	2715
25	228	326	446	590	761	959	1176	470	794	1130	1490	1886	2319	2788
26	221	321	443	590	763	963	1190	458	795	1143	1515	1923	2368	2850
27	213	316	441	590	766	968	1198	444	792	1153	1537	1958	2416	2909
28	206	311	438	590	768	973	1205	427	788	1160	1557	1990	2460	2966
29	198	306	436	590	770	978	1212	407	773	1158	1567	2012	2494	3013
30	191	301	433	589	773	983	1220	392	746	1143	1565	2023	2517	3048
31	183	296	430	589	775	988	1227	382	721	1131	1564	2035	2541	3085
32	176	291	428	589	777	992	1234	372	693	1104	1551	2033	2552	3108
33	168	286	425	589	780	997	1241	362	663	1052	1510	2005	2537	3105
34	161	281	423	589	782	1002	1249	352	644	1008	1464	1972	2515	3096
35	153	276	420	589	784	1007	1256	342	634	970	1394	1896	2452	3044
36	146	271	418	589	787	1012	1263	332	624	930	1318	1776	2324	2929
37	138	266	415	589	789	1016	1271	322	614	907	1257	1670	2163	2756
38	131	261	412	589	791	1021	1278	312	604	897	1206	1570	2008	2537
39	123	255	410	588	794	1026	1285	302	594	887	1179	1492	1871	2334
40	115	250	407	588	796	1031	1292	292	584	877	1169	1461	1779	2172

Figure C.17.a: Table of HRRs of Power Inverter & 1.5 ft. Cable Tray Fires

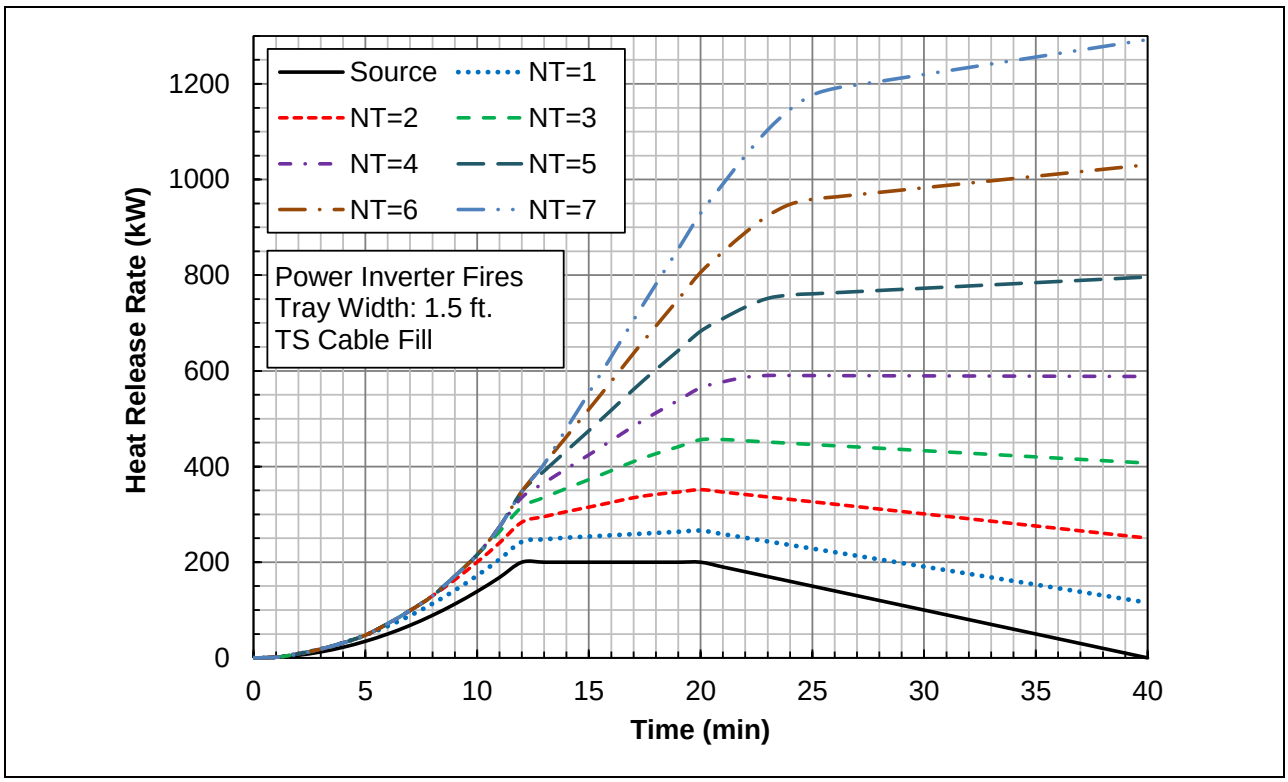

Figure C.17.b: HRR Plots of Power Inverter & 1.5 ft. TS Cable Tray Fires

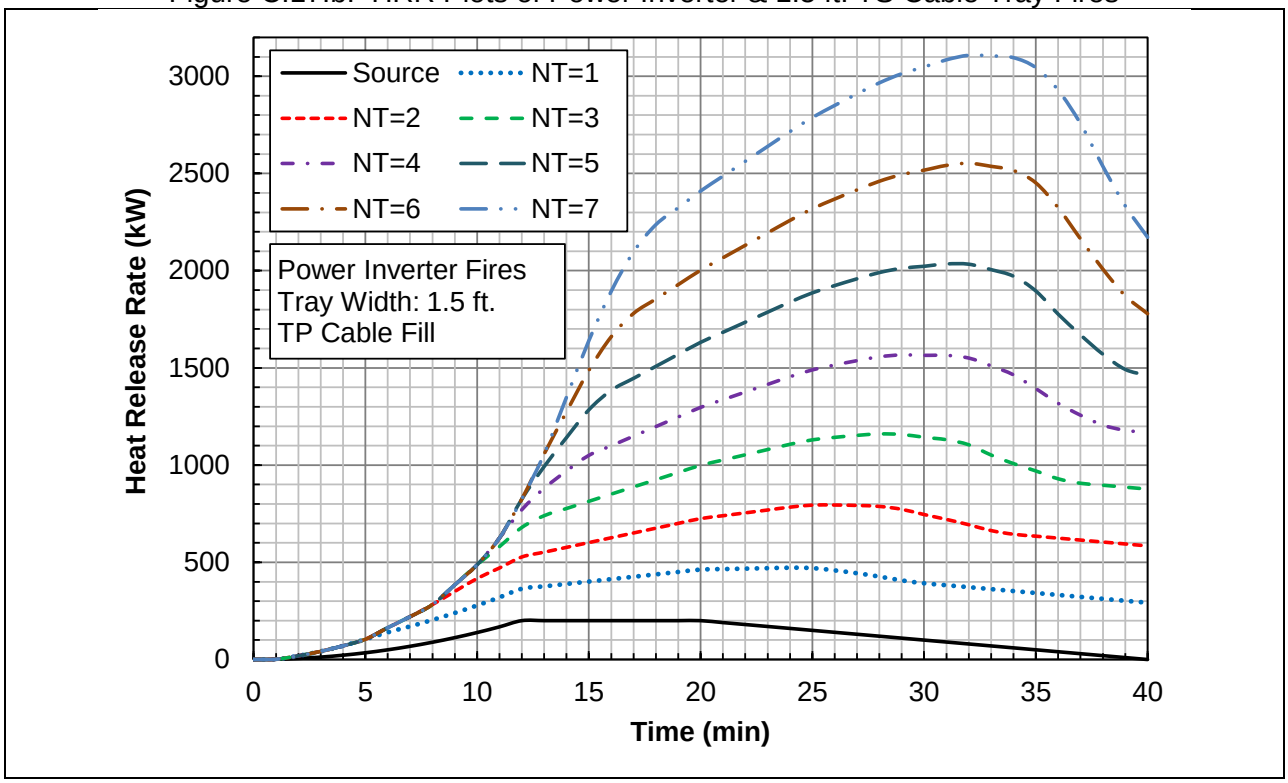

Figure C.17.c: HRR Plots of Power Inverter & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	11	11	11	11	11	11	11	32	32	32	32	32	32	32
3	24	24	24	24	24	24	24	71	71	71	71	71	71	71
4	41	41	41	41	41	41	41	119	119	119	119	119	119	119
5	60	60	60	60	60	60	60	174	174	174	174	174	174	174
6	83	93	93	93	93	93	93	230	277	277	277	277	277	277
7	109	130	130	130	130	130	130	273	373	373	373	373	373	373
8	138	170	170	170	170	170	170	318	476	476	476	476	476	476
9	170	214	229	229	229	229	229	366	588	656	656	656	656	656
10	205	262	292	292	292	292	292	418	695	837	837	837	837	837
11	244	313	359	379	379	379	379	471	774	994	1082	1082	1082	1082
12	285	367	430	471	495	495	495	528	855	1159	1341	1451	1451	1451
13	295	391	471	532	581	611	611	553	904	1279	1561	1785	1915	1915
14	303	411	509	591	666	725	759	577	954	1353	1740	2083	2348	2499
15	308	430	545	649	750	839	908	602	1003	1428	1900	2369	2774	3081
16	312	450	583	708	835	955	1059	627	1052	1502	1999	2569	3120	3588
17	317	470	621	769	923	1073	1212	651	1102	1576	2098	2693	3360	3994
18	322	484	654	824	1005	1187	1362	676	1151	1650	2196	2816	3509	4274
19	327	493	683	876	1085	1299	1509	701	1201	1724	2295	2940	3657	4447
20	332	503	712	929	1166	1412	1659	726	1250	1798	2394	3063	3805	4620
21	327	503	723	964	1229	1507	1791	740	1289	1862	2483	3176	3943	4782
22	322	503	728	993	1286	1598	1919	755	1329	1926	2571	3290	4081	4945
23	317	503	732	1011	1333	1678	2037	770	1368	1990	2660	3403	4219	5108
24	312	503	737	1020	1357	1736	2133	784	1407	2054	2749	3517	4357	5271
25	307	503	742	1030	1372	1767	2203	791	1439	2110	2829	3622	4487	5425
26	302	503	747	1040	1387	1787	2241	777	1449	2145	2890	3707	4597	5560
27	297	502	752	1050	1401	1807	2265	758	1455	2176	2945	3786	4701	5689
28	292	502	757	1059	1416	1826	2290	733	1455	2201	2994	3861	4800	5812
29	287	502	761	1069	1431	1846	2315	704	1435	2205	3024	3915	4879	5916
30	282	502	766	1079	1445	1865	2339	684	1391	2186	3029	3945	4934	5996
31	277	502	771	1089	1460	1885	2364	674	1352	2171	3039	3979	4993	6079
32	271	502	776	1098	1475	1905	2388	664	1307	2129	3021	3987	5025	6136
33	266	502	781	1108	1490	1924	2413	654	1256	2034	2951	3941	5004	6139
34	261	502	785	1118	1504	1944	2437	644	1229	1956	2869	3883	4971	6131
35	256	501	790	1128	1519	1964	2462	634	1219	1890	2737	3741	4853	6039
36	251	501	795	1138	1534	1983	2487	624	1209	1819	2596	3513	4608	5817
37	246	501	800	1147	1548	2003	2511	614	1199	1783	2483	3309	4297	5482
38	241	501	805	1157	1563	2023	2536	604	1189	1773	2392	3121	3996	5054
39	236	501	809	1167	1578	2042	2560	594	1179	1763	2348	2975	3733	4658
40	231	501	814	1177	1592	2062	2585	584	1169	1753	2338	2922	3557	4344

Figure C.18.a: Table of HRRs of Power Inverter & 3.0 ft. Cable Tray Fires

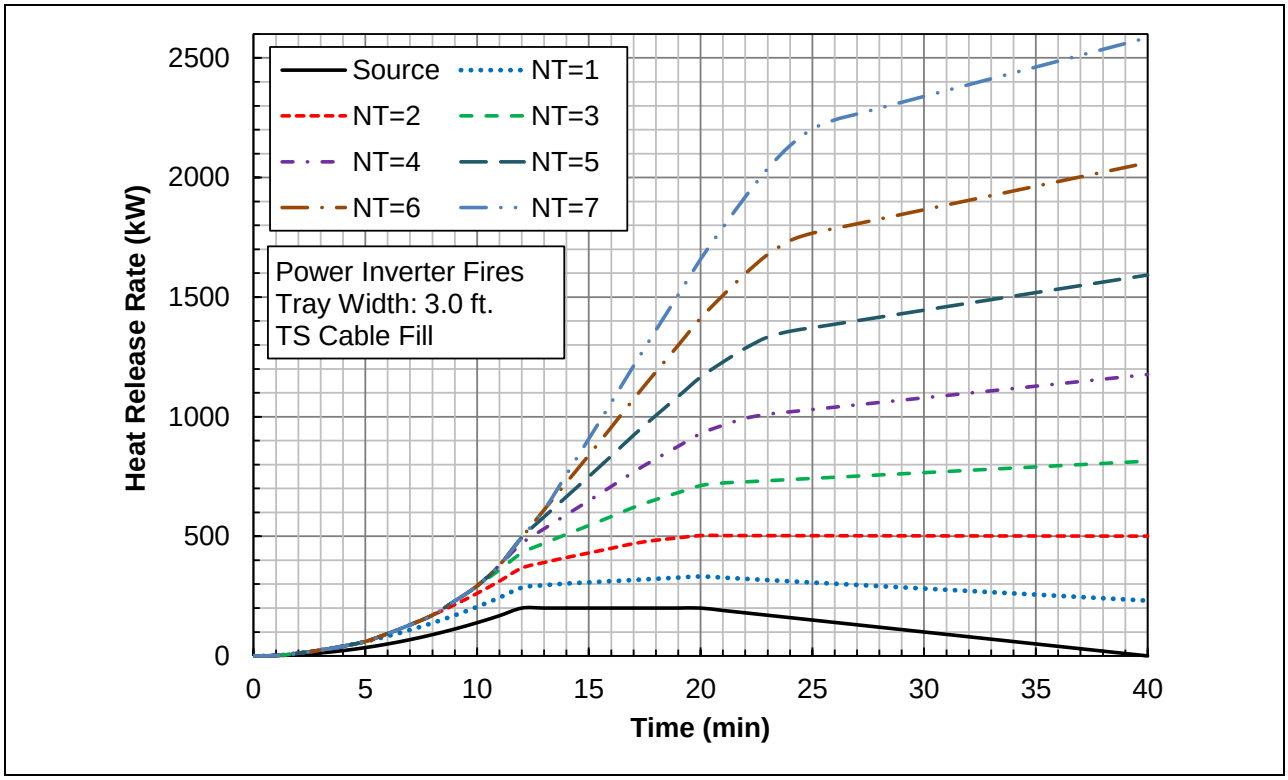

Figure C.18.b: HRR Plots of Power Inverter & 3.0 ft. TS Cable Tray Fires

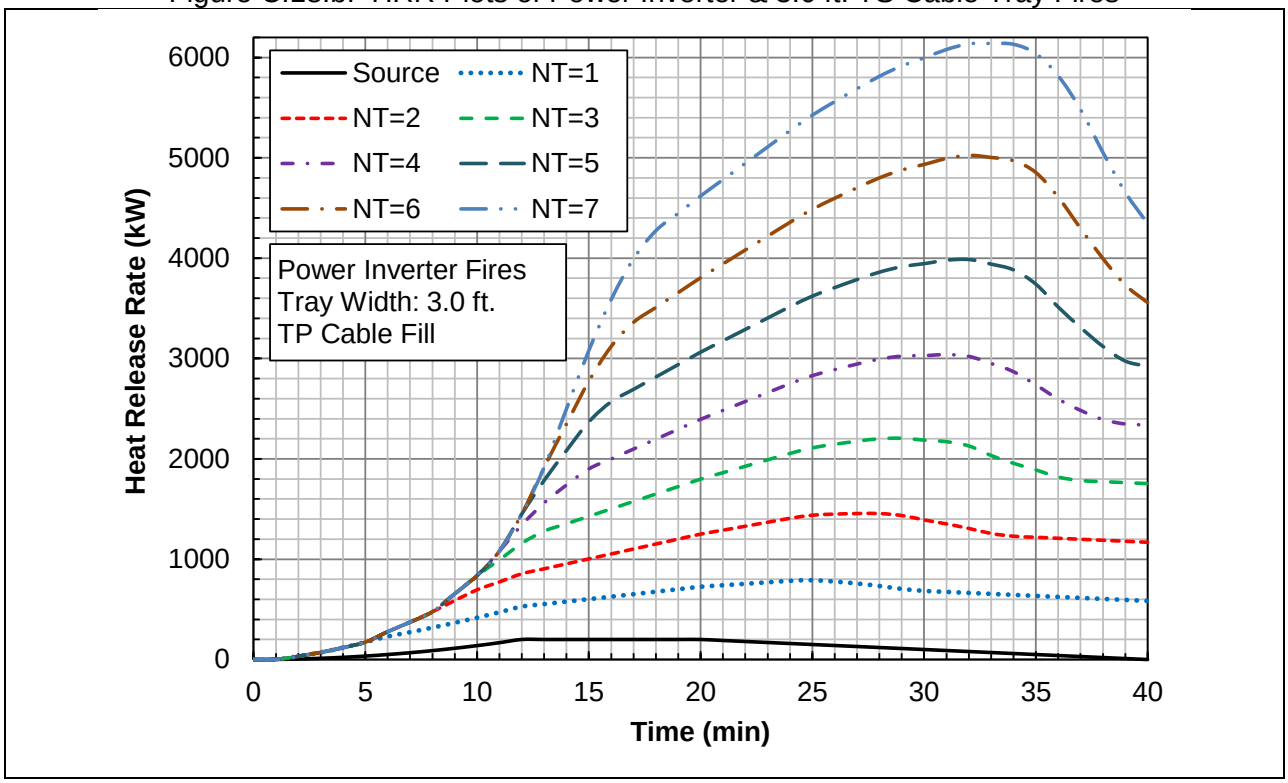

Figure C.18.c: HRR Plots of Power Inverter & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	8	8	8	8	8	8	8	19	19	19	19	19	19	19
3	18	18	18	18	18	18	18	42	42	42	42	42	42	42
4	31	31	31	31	31	31	31	70	70	70	70	70	70	70
5	47	47	47	47	47	47	47	104	104	104	104	104	104	104
6	66	72	72	72	72	72	72	140	164	164	164	164	164	164
7	88	99	99	99	99	99	99	170	220	220	220	220	220	220
8	113	130	130	130	130	130	130	204	283	283	283	283	283	283
9	141	163	171	171	171	171	171	239	350	384	384	384	384	384
10	172	200	216	216	216	216	216	278	417	488	488	488	488	488
11	206	240	264	274	274	274	274	320	471	581	625	625	625	625
12	243	284	315	335	348	348	348	364	527	679	771	825	825	825
13	248	295	335	366	391	405	405	376	552	740	881	993	1058	1058
14	251	306	354	395	433	463	480	389	577	777	970	1142	1274	1349
15	254	315	373	424	475	520	554	401	602	814	1050	1284	1487	1640
16	256	325	391	454	518	578	629	413	626	851	1099	1385	1660	1894
17	259	335	410	484	561	637	706	426	651	888	1149	1446	1780	2097
18	261	342	427	512	603	694	781	438	676	925	1198	1508	1854	2237
19	264	347	441	538	642	749	855	450	700	962	1248	1570	1928	2323
20	266	352	456	565	683	806	929	463	725	999	1297	1631	2002	2410
21	259	347	456	577	709	849	991	465	740	1026	1336	1683	2066	2486
22	251	342	454	587	733	889	1050	467	754	1053	1376	1735	2131	2563
23	244	336	451	590	751	924	1103	470	769	1080	1415	1787	2195	2639
24	236	331	449	590	759	948	1147	472	784	1107	1454	1838	2259	2715
25	228	326	446	590	761	959	1176	470	794	1130	1490	1886	2319	2788
26	221	321	443	590	763	963	1190	458	795	1143	1515	1923	2368	2850
27	213	316	441	590	766	968	1198	444	792	1153	1537	1958	2416	2909
28	206	311	438	590	768	973	1205	427	788	1160	1557	1990	2460	2966
29	198	306	436	590	770	978	1212	407	773	1158	1567	2012	2494	3013
30	191	301	433	589	773	983	1220	392	746	1143	1565	2023	2517	3048
31	183	296	430	589	775	988	1227	382	721	1131	1564	2035	2541	3085
32	176	291	428	589	777	992	1234	372	693	1104	1551	2033	2552	3108
33	168	286	425	589	780	997	1241	362	663	1052	1510	2005	2537	3105
34	161	281	423	589	782	1002	1249	352	644	1008	1464	1972	2515	3096
35	153	276	420	589	784	1007	1256	342	634	970	1394	1896	2452	3044
36	146	271	418	589	787	1012	1263	332	624	930	1318	1776	2324	2929
37	138	266	415	589	789	1016	1271	322	614	907	1257	1670	2163	2756
38	131	261	412	589	791	1021	1278	312	604	897	1206	1570	2008	2537
39	123	255	410	588	794	1026	1285	302	594	887	1179	1492	1871	2334
40	115	250	407	588	796	1031	1292	292	584	877	1169	1461	1779	2172

Figure C.19.a: Table of HRRs of Closed Medium Enclosure & 1.5 ft. Cable Tray Fires

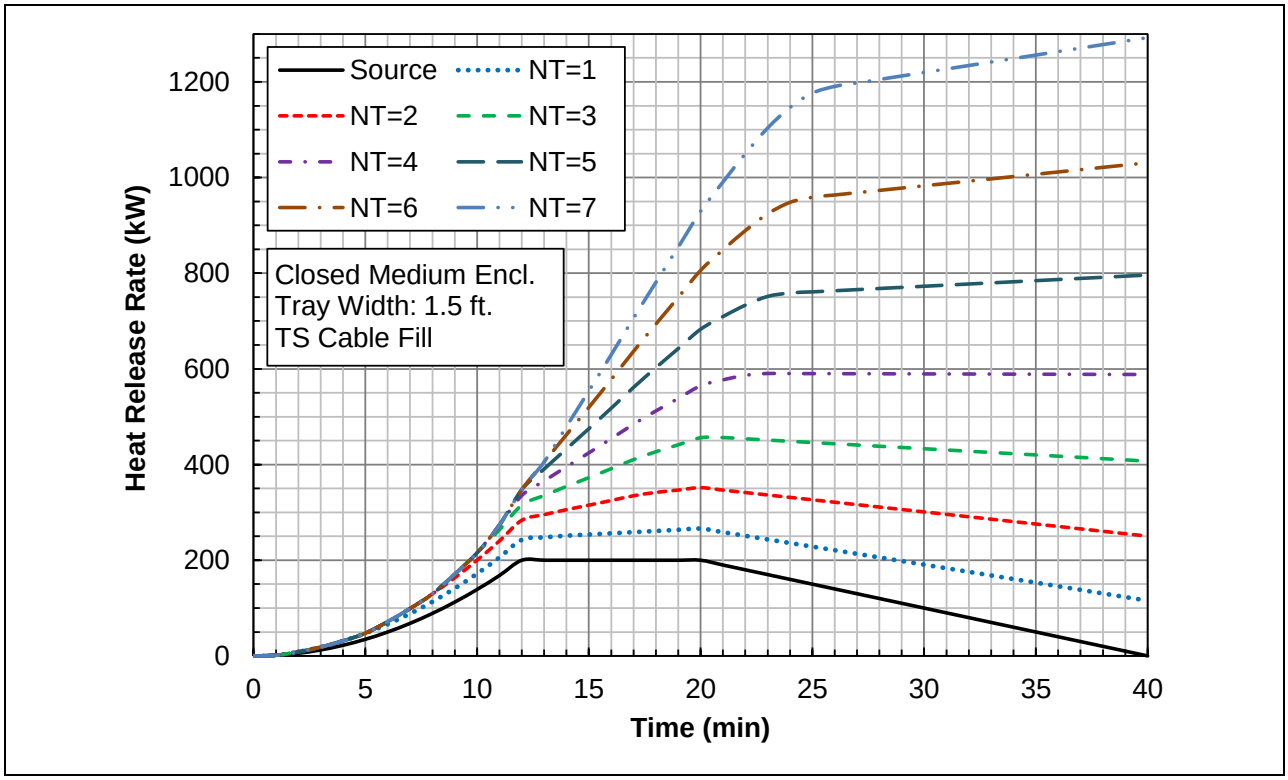

Figure C.19.b: HRR Plots of Closed Medium Enclosure & 1.5 ft. TS Cable Tray Fires

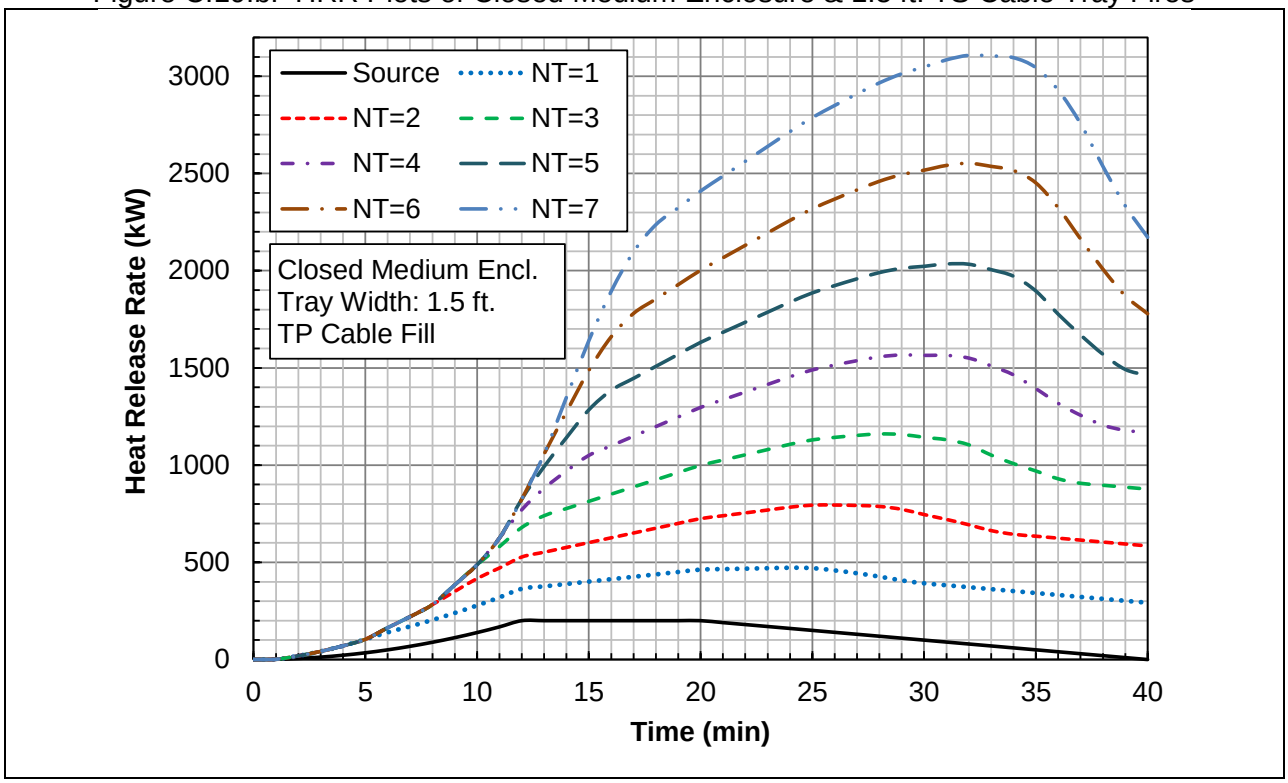

Figure C.19.c: HRR Plots of Closed Medium Enclosure & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	11	11	11	11	11	11	11	32	32	32	32	32	32	32
3	24	24	24	24	24	24	24	71	71	71	71	71	71	71
4	41	41	41	41	41	41	41	119	119	119	119	119	119	119
5	60	60	60	60	60	60	60	174	174	174	174	174	174	174
6	83	93	93	93	93	93	93	230	277	277	277	277	277	277
7	109	130	130	130	130	130	130	273	373	373	373	373	373	373
8	138	170	170	170	170	170	170	318	476	476	476	476	476	476
9	170	214	229	229	229	229	229	366	588	656	656	656	656	656
10	205	262	292	292	292	292	292	418	695	837	837	837	837	837
11	244	313	359	379	379	379	379	471	774	994	1082	1082	1082	1082
12	285	367	430	471	495	495	495	528	855	1159	1341	1451	1451	1451
13	295	391	471	532	581	611	611	553	904	1279	1561	1785	1915	1915
14	303	411	509	591	666	725	759	577	954	1353	1740	2083	2348	2499
15	308	430	545	649	750	839	908	602	1003	1428	1900	2369	2774	3081
16	312	450	583	708	835	955	1059	627	1052	1502	1999	2569	3120	3588
17	317	470	621	769	923	1073	1212	651	1102	1576	2098	2693	3360	3994
18	322	484	654	824	1005	1187	1362	676	1151	1650	2196	2816	3509	4274
19	327	493	683	876	1085	1299	1509	701	1201	1724	2295	2940	3657	4447
20	332	503	712	929	1166	1412	1659	726	1250	1798	2394	3063	3805	4620
21	327	503	723	964	1229	1507	1791	740	1289	1862	2483	3176	3943	4782
22	322	503	728	993	1286	1598	1919	755	1329	1926	2571	3290	4081	4945
23	317	503	732	1011	1333	1678	2037	770	1368	1990	2660	3403	4219	5108
24	312	503	737	1020	1357	1736	2133	784	1407	2054	2749	3517	4357	5271
25	307	503	742	1030	1372	1767	2203	791	1439	2110	2829	3622	4487	5425
26	302	503	747	1040	1387	1787	2241	777	1449	2145	2890	3707	4597	5560
27	297	502	752	1050	1401	1807	2265	758	1455	2176	2945	3786	4701	5689
28	292	502	757	1059	1416	1826	2290	733	1455	2201	2994	3861	4800	5812
29	287	502	761	1069	1431	1846	2315	704	1435	2205	3024	3915	4879	5916
30	282	502	766	1079	1445	1865	2339	684	1391	2186	3029	3945	4934	5996
31	277	502	771	1089	1460	1885	2364	674	1352	2171	3039	3979	4993	6079
32	271	502	776	1098	1475	1905	2388	664	1307	2129	3021	3987	5025	6136
33	266	502	781	1108	1490	1924	2413	654	1256	2034	2951	3941	5004	6139
34	261	502	785	1118	1504	1944	2437	644	1229	1956	2869	3883	4971	6131
35	256	501	790	1128	1519	1964	2462	634	1219	1890	2737	3741	4853	6039
36	251	501	795	1138	1534	1983	2487	624	1209	1819	2596	3513	4608	5817
37	246	501	800	1147	1548	2003	2511	614	1199	1783	2483	3309	4297	5482
38	241	501	805	1157	1563	2023	2536	604	1189	1773	2392	3121	3996	5054
39	236	501	809	1167	1578	2042	2560	594	1179	1763	2348	2975	3733	4658
40	231	501	814	1177	1592	2062	2585	584	1169	1753	2338	2922	3557	4344

Figure C.20.a: Table of HRRs of Closed Medium Enclosure & 3.0 ft. Cable Tray Fires

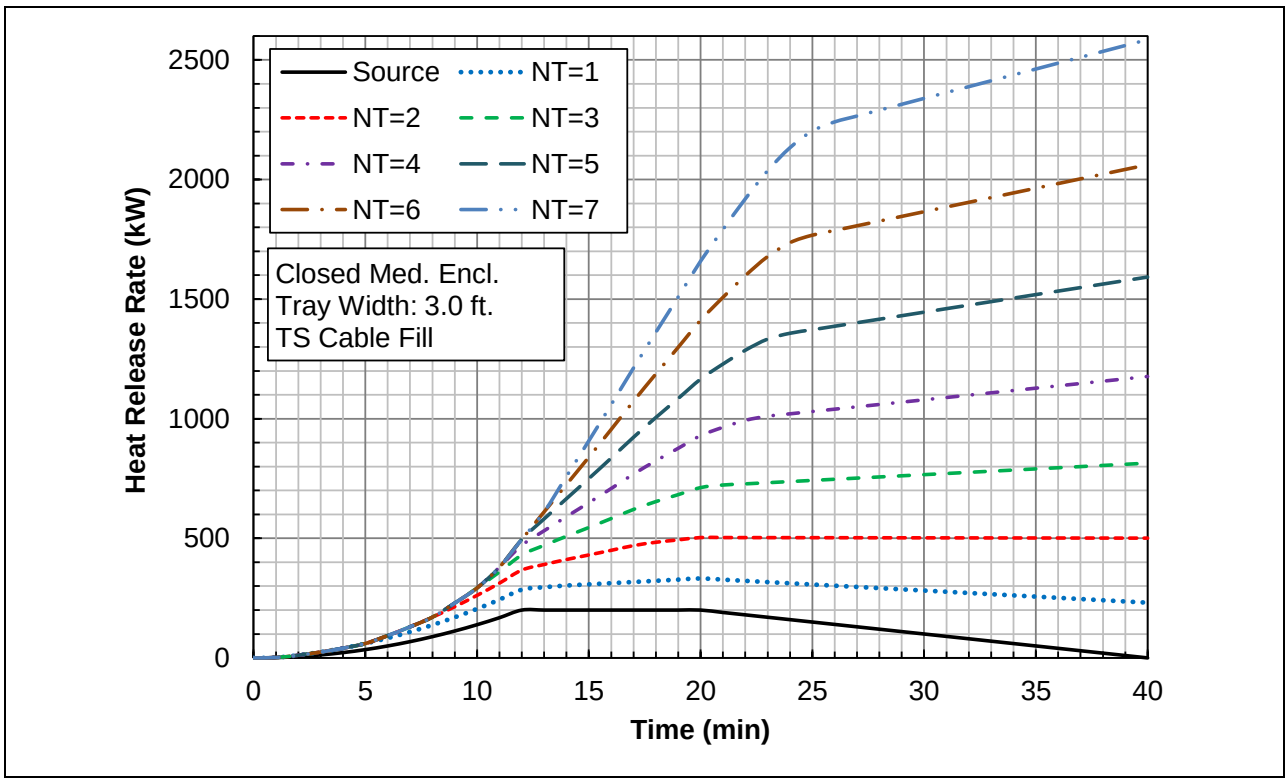

Figure C.20.b: HRR Plots of Closed Medium Enclosure & 3.0 ft. TS Cable Tray Fires

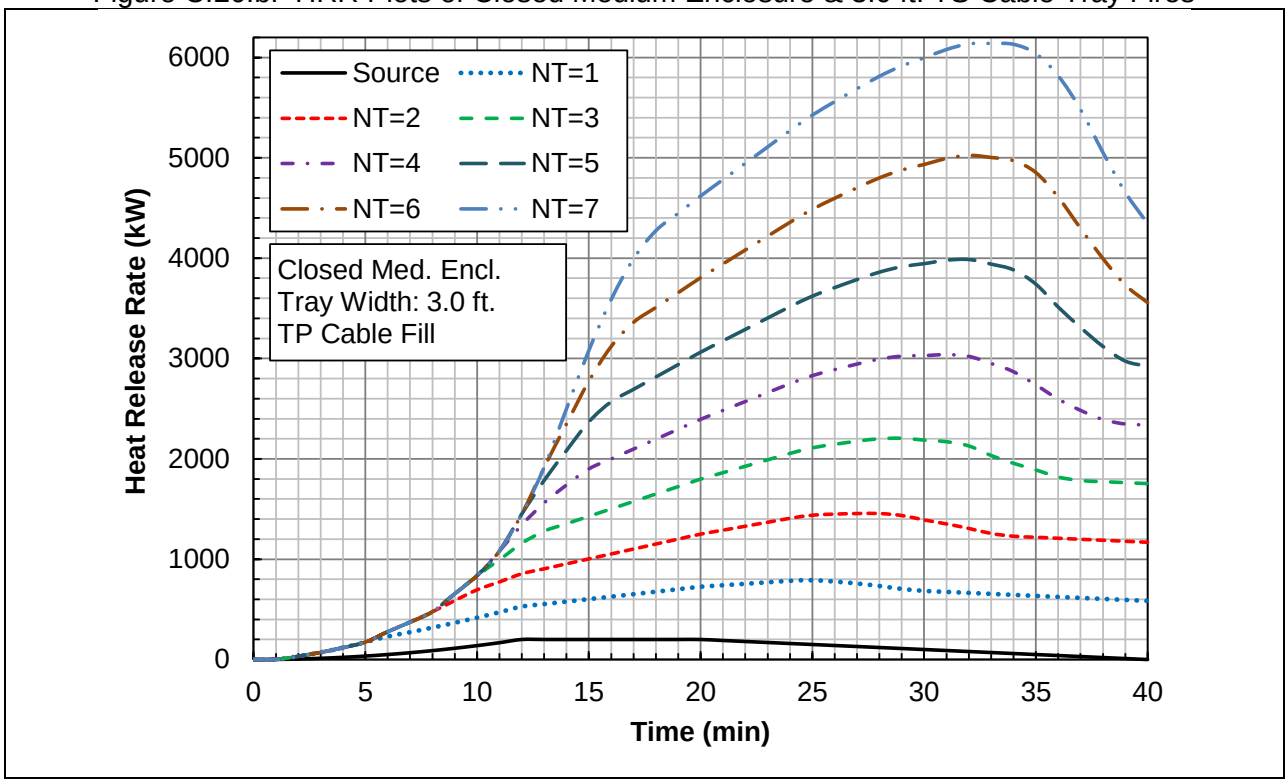

Figure C.20.c: HRR Plots of Closed Medium Enclosure & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	13	13	13	13	13	13	13	25	25	25	25	25	25	25
3	27	27	27	27	27	27	27	55	55	55	55	55	55	55
4	47	47	47	47	47	47	47	92	92	92	92	92	92	92
5	72	72	72	72	72	72	72	136	136	136	136	136	136	136
6	101	106	106	106	106	106	106	184	210	210	210	210	210	210
7	134	146	146	146	146	146	146	225	281	281	281	281	281	281
8	173	191	191	191	191	191	191	271	358	358	358	358	358	358
9	216	241	249	249	249	249	249	322	443	480	480	480	480	480
10	264	295	312	312	312	312	312	377	528	604	604	604	604	604
11	317	355	380	391	391	391	391	437	601	718	765	765	765	765
12	374	419	453	475	488	488	488	501	677	839	936	993	993	993
13	380	432	475	508	534	549	549	514	702	902	1050	1168	1235	1235
14	384	443	496	539	578	609	627	526	727	939	1142	1322	1460	1538
15	386	454	515	570	623	669	705	538	751	976	1224	1469	1680	1838
16	389	464	535	601	668	730	784	551	776	1013	1274	1571	1857	2099
17	391	474	555	633	714	792	864	563	801	1050	1323	1633	1979	2306
18	394	482	573	663	757	852	942	575	825	1087	1373	1695	2053	2448
19	396	487	588	690	799	910	1019	588	850	1124	1422	1756	2127	2535
20	399	491	603	718	841	969	1097	600	875	1161	1471	1818	2201	2621
21	385	480	597	725	863	1007	1154	596	883	1182	1504	1864	2259	2691
22	371	469	589	728	882	1043	1209	592	892	1203	1538	1909	2317	2762
23	357	458	580	726	894	1074	1259	588	900	1223	1571	1955	2375	2832
24	343	446	571	720	896	1092	1297	585	908	1244	1604	2000	2433	2902
25	330	435	562	713	892	1097	1322	576	912	1260	1632	2041	2486	2967
26	316	424	553	707	888	1095	1330	555	903	1264	1648	2069	2526	3020
27	302	412	544	701	884	1094	1331	531	892	1265	1662	2095	2565	3071
28	288	401	535	694	880	1093	1332	505	879	1264	1673	2118	2600	3119
29	274	390	527	688	876	1091	1333	477	854	1251	1673	2131	2625	3156
30	261	378	518	682	872	1090	1334	455	817	1227	1661	2131	2638	3181
31	247	367	509	675	868	1088	1335	438	783	1205	1652	2134	2653	3209
32	233	356	500	669	864	1087	1336	422	747	1170	1628	2123	2655	3222
33	219	344	491	662	861	1085	1337	406	708	1105	1576	2084	2627	3208
34	206	333	482	656	857	1084	1338	390	682	1052	1520	2039	2595	3188
35	192	322	474	650	853	1082	1339	373	666	1005	1437	1951	2519	3124
36	178	310	465	643	849	1081	1340	357	649	956	1350	1818	2376	2994
37	164	299	456	637	845	1080	1341	341	633	925	1279	1698	2201	2805
38	150	288	447	631	841	1078	1342	325	617	909	1220	1588	2032	2569
39	137	277	438	624	837	1077	1343	308	601	893	1185	1500	1882	2351
40	123	265	429	618	833	1075	1344	292	584	877	1169	1461	1780	2177

Figure C.21.a: Table of HRRs of Open Medium Enclosure & 1.5 ft. Cable Tray Fires

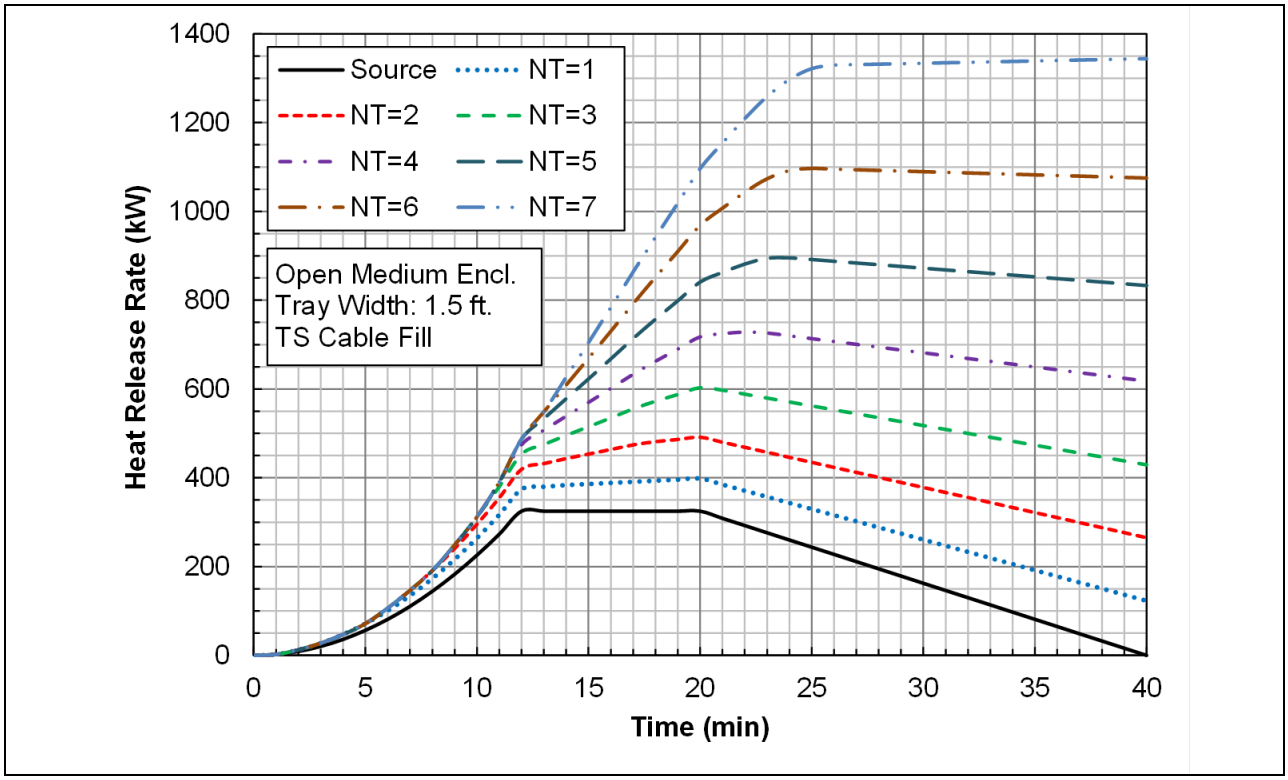

Figure C.21.b: HRR Plots of Open Medium Enclosure & 1.5 ft. TS Cable Tray Fires

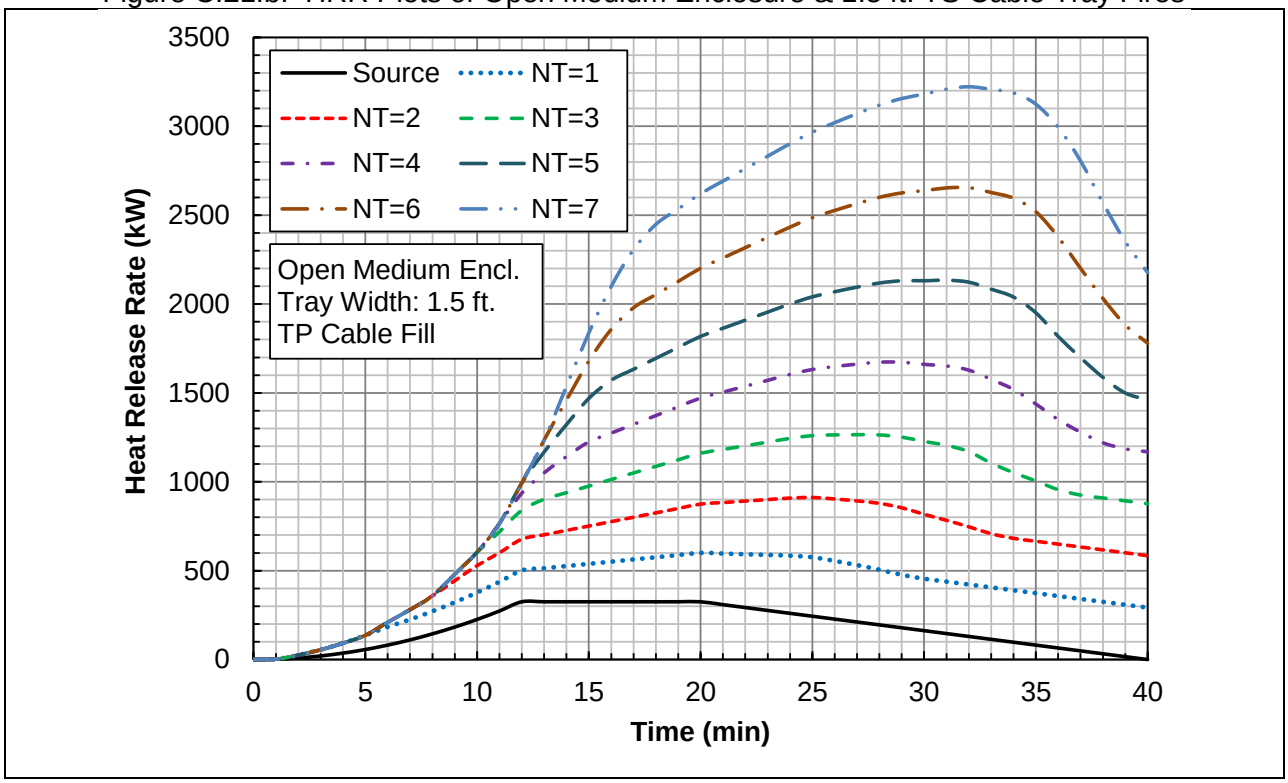

Figure C.21.c: HRR Plots of Open Medium Enclosure & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	16	16	16	16	16	16	16	41	41	41	41	41	41	41
3	35	35	35	35	35	35	35	90	90	90	90	90	90	90
4	58	58	58	58	58	58	58	148	148	148	148	148	148	148
5	87	87	87	87	87	87	87	216	216	216	216	216	216	216
6	120	132	132	132	132	132	132	286	339	339	339	339	339	339
7	158	182	182	182	182	182	182	340	451	451	451	451	451	451
8	202	238	238	238	238	238	238	398	572	572	572	572	572	572
9	250	299	315	315	315	315	315	461	704	777	777	777	777	777
10	303	365	398	398	398	398	398	529	831	983	983	983	983	983
11	361	437	487	508	508	508	508	601	928	1164	1258	1258	1258	1258
12	423	514	582	624	650	650	650	678	1029	1354	1547	1661	1661	1661
13	435	539	625	690	742	773	773	702	1079	1478	1776	2010	2145	2145
14	442	562	666	753	832	894	929	727	1128	1552	1960	2319	2594	2750
15	447	582	705	815	921	1014	1085	752	1177	1627	2124	2613	3034	3351
16	452	603	745	878	1011	1136	1243	776	1227	1701	2223	2818	3389	3872
17	457	624	786	942	1103	1260	1403	801	1276	1775	2321	2941	3634	4288
18	462	638	820	1000	1190	1379	1559	826	1326	1849	2420	3064	3782	4572
19	467	648	850	1055	1273	1495	1713	851	1375	1923	2519	3188	3930	4745
20	472	658	881	1110	1357	1613	1868	875	1424	1997	2618	3311	4078	4917
21	461	652	886	1140	1417	1706	2000	884	1457	2055	2700	3419	4210	5074
22	449	645	885	1164	1471	1794	2126	892	1491	2113	2783	3526	4342	5231
23	438	639	883	1176	1513	1871	2242	901	1524	2170	2865	3633	4474	5387
24	427	632	882	1180	1531	1924	2335	909	1557	2228	2948	3740	4605	5544
25	415	626	880	1183	1540	1950	2400	907	1580	2276	3020	3837	4727	5690
26	404	620	879	1187	1548	1963	2432	882	1579	2300	3069	3911	4825	5813
27	393	613	877	1190	1557	1977	2450	851	1573	2319	3112	3979	4918	5931
28	382	607	876	1194	1565	1990	2469	816	1562	2332	3151	4042	5006	6043
29	370	601	875	1197	1574	2003	2487	775	1529	2324	3167	4083	5071	6133
30	359	594	873	1201	1582	2017	2505	747	1472	2291	3159	4099	5113	6199
31	348	588	872	1204	1590	2030	2524	731	1420	2265	3157	4122	5160	6271
32	336	581	870	1208	1599	2044	2542	714	1364	2209	3126	4116	5179	6315
33	325	575	869	1211	1607	2057	2560	698	1302	2097	3039	4054	5141	6302
34	314	569	867	1215	1616	2070	2579	682	1266	2006	2942	3981	5093	6278
35	302	562	866	1218	1624	2084	2597	666	1250	1929	2794	3820	4957	6167
36	291	556	864	1222	1633	2097	2615	649	1234	1846	2635	3570	4688	5922
37	280	550	863	1225	1641	2110	2633	633	1218	1802	2509	3348	4353	5562
38	268	543	862	1229	1649	2124	2652	617	1201	1786	2407	3143	4031	5106
39	257	537	860	1232	1658	2137	2670	601	1185	1769	2354	2983	3748	4686
40	246	530	859	1236	1666	2151	2688	584	1169	1753	2338	2922	3559	4354

Figure C.22.a: Table of HRRs of Open Medium Enclosure & 3.0 ft. Cable Tray Fires

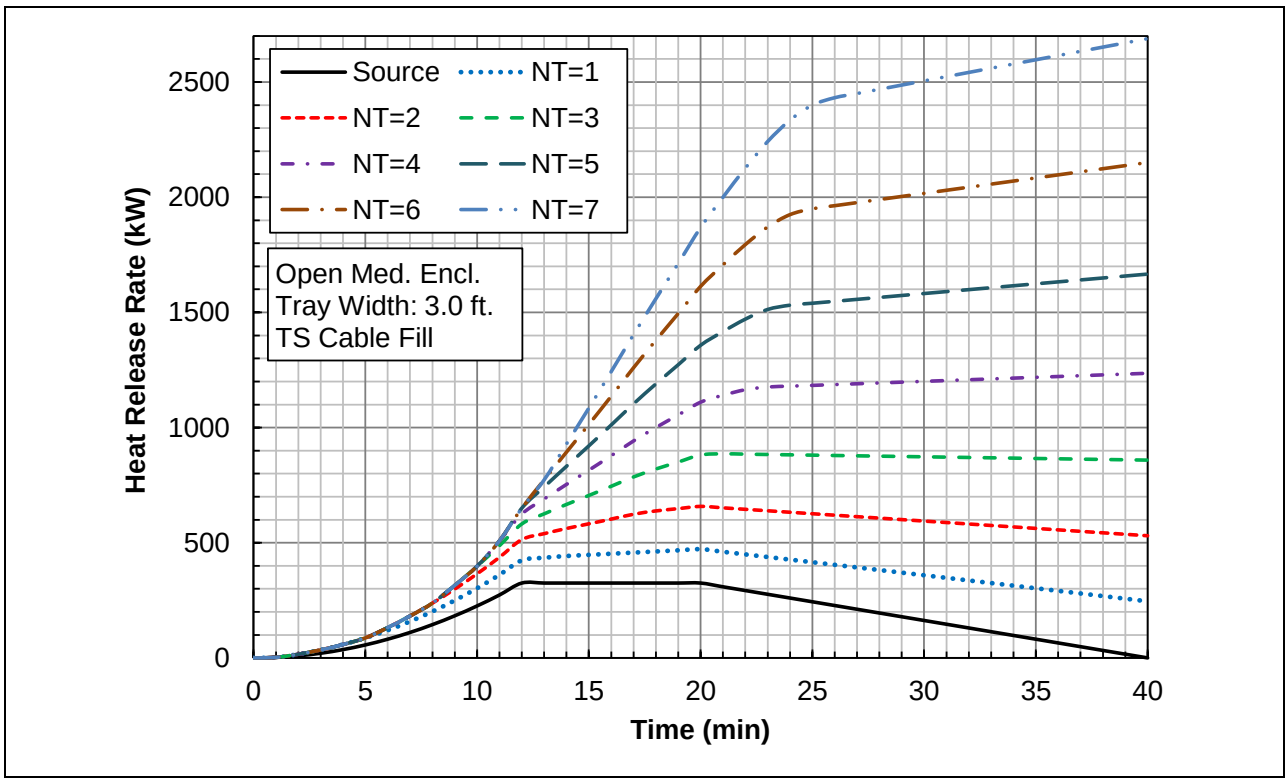

Figure C.22.b: HRR Plots of Open Medium Enclosure & 3.0 ft. TS Cable Tray Fires

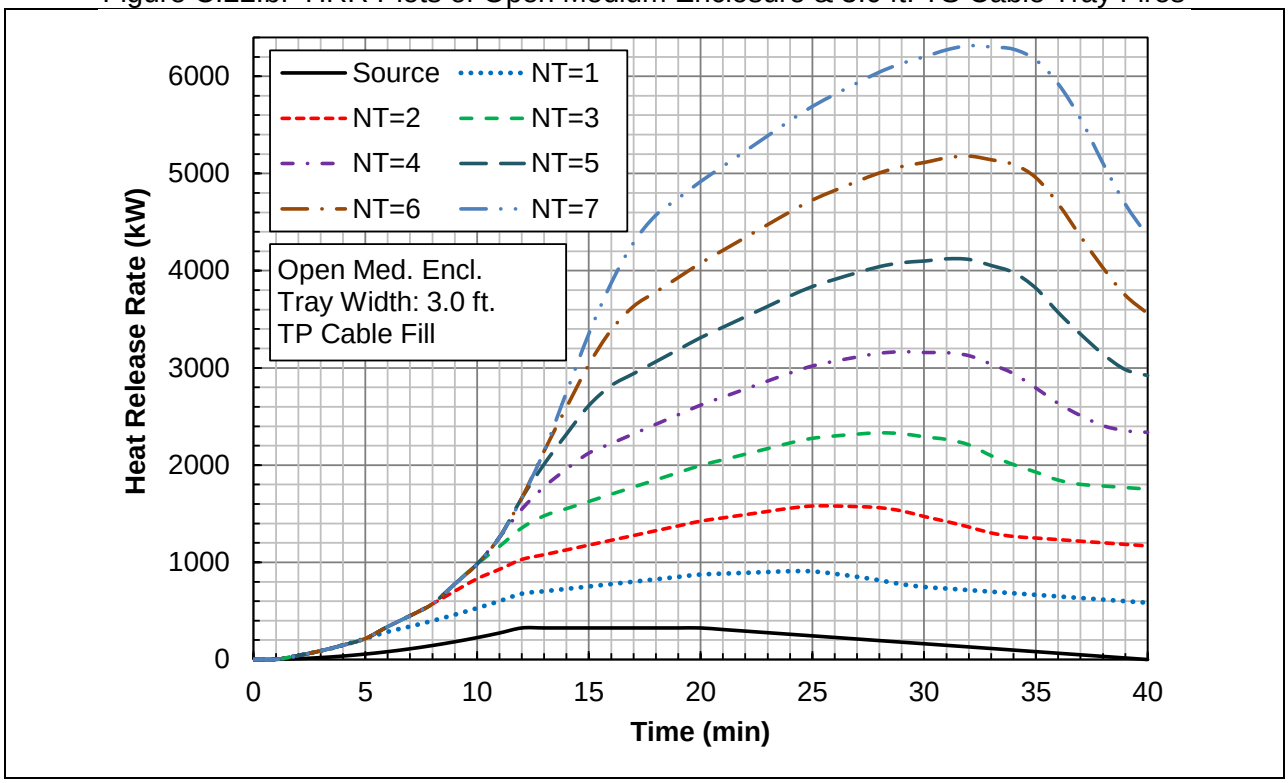

Figure C.22.c: HRR Plots of Open Medium Enclosure & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2	15	15	15	15	15	15	15	28	28	28	28	28	28	28
3	33	33	33	33	33	33	33	62	62	62	62	62	62	62
4	56	56	56	56	56	56	56	104	104	104	104	104	104	104
5	86	86	86	86	86	86	86	154	154	154	154	154	154	154
6	121	127	127	127	127	127	127	208	236	236	236	236	236	236
7	162	174	174	174	174	174	174	257	315	315	315	315	315	315
8	208	227	227	227	227	227	227	311	402	402	402	402	402	402
9	261	286	295	295	295	295	295	370	497	535	535	535	535	535
10	319	352	369	369	369	369	369	436	593	671	671	671	671	671
11	383	423	449	460	460	460	460	506	676	797	846	846	846	846
12	452	500	535	557	570	570	570	582	764	932	1031	1089	1089	1089
13	458	513	558	591	617	633	633	595	789	995	1147	1267	1336	1336
14	462	525	579	623	664	695	713	607	814	1032	1241	1424	1564	1643
15	465	535	599	655	709	756	793	619	838	1069	1324	1574	1788	1949
16	467	546	619	687	755	819	873	632	863	1106	1373	1677	1968	2213
17	470	557	640	720	803	882	955	644	888	1143	1422	1738	2091	2423
18	472	564	658	750	847	943	1035	656	912	1180	1472	1800	2165	2566
19	475	569	673	778	889	1003	1113	669	937	1217	1521	1862	2239	2652
20	477	574	689	806	932	1063	1192	681	962	1254	1571	1923	2313	2739
21	460	559	680	810	951	1098	1248	674	966	1271	1600	1965	2367	2805
22	442	544	667	810	967	1131	1300	666	971	1288	1629	2007	2421	2871
23	425	529	654	805	976	1159	1347	658	976	1305	1659	2049	2475	2938
24	407	513	642	794	974	1174	1382	651	981	1322	1688	2090	2529	3004
25	390	498	629	784	966	1175	1403	637	980	1334	1712	2127	2578	3065
26	372	483	617	774	959	1170	1408	612	966	1333	1723	2150	2614	3113
27	354	468	604	764	951	1165	1405	583	950	1329	1732	2171	2647	3159
28	337	453	591	754	943	1159	1402	552	931	1323	1738	2189	2678	3202
29	319	438	579	744	936	1154	1400	518	901	1305	1732	2196	2697	3234
30	302	423	566	734	928	1149	1397	492	859	1275	1715	2191	2704	3253
31	284	408	554	724	920	1144	1394	472	820	1248	1701	2189	2714	3276
32	267	393	541	713	913	1139	1391	452	779	1207	1672	2173	2710	3284
33	249	378	528	703	905	1133	1389	432	735	1137	1614	2127	2677	3263
34	232	363	516	693	897	1128	1386	412	704	1077	1551	2076	2639	3237
35	214	348	503	683	890	1123	1383	392	684	1025	1462	1981	2556	3167
36	197	333	491	673	882	1118	1381	372	664	971	1369	1841	2405	3028
37	179	318	478	663	874	1113	1378	352	644	937	1292	1714	2221	2831
38	162	303	465	653	867	1107	1375	332	624	917	1228	1598	2045	2587
39	144	288	453	643	859	1102	1372	312	604	897	1189	1504	1888	2360
40	127	272	440	632	851	1097	1370	292	584	877	1169	1461	1780	2179

Figure C.23.a: Table of HRRs of Closed Large Enclosure & 1.5 ft. Cable Tray Fires

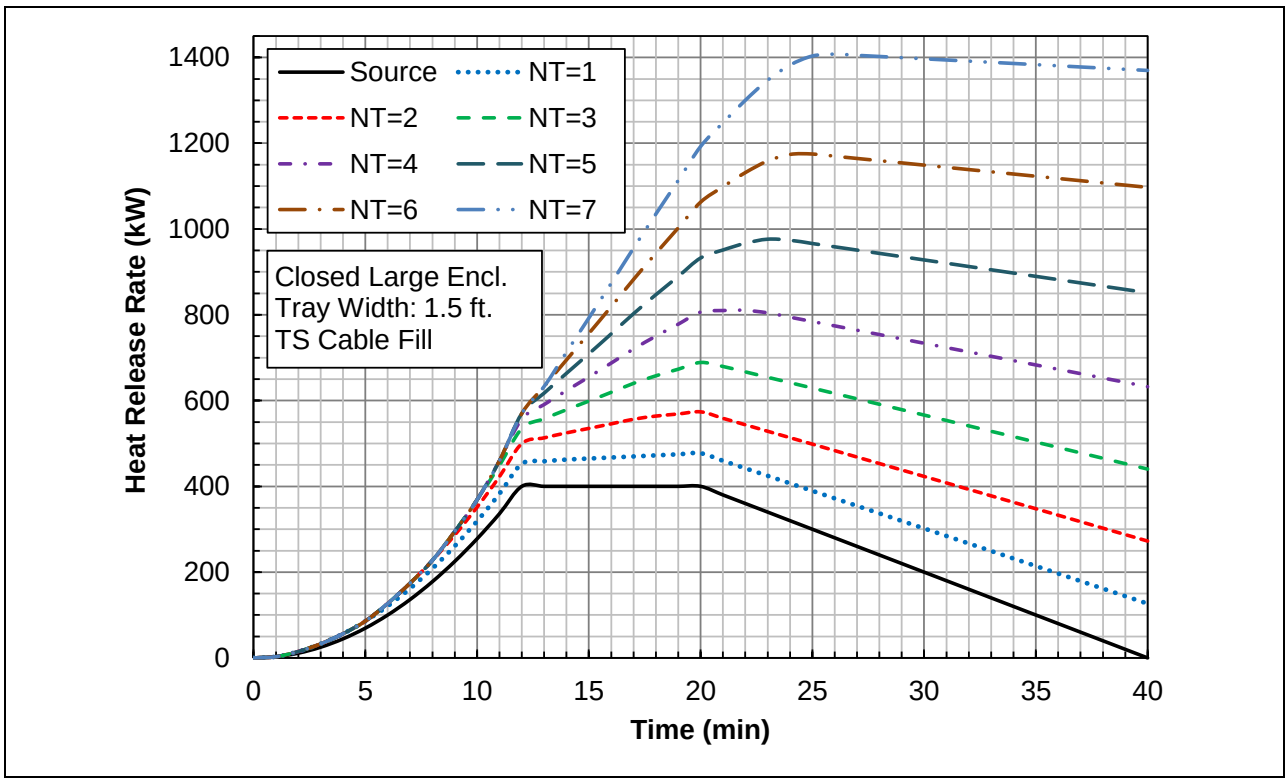

Figure C.23.b: HRR Plots of Closed Large Enclosure & 1.5 ft. TS Cable Tray Fires

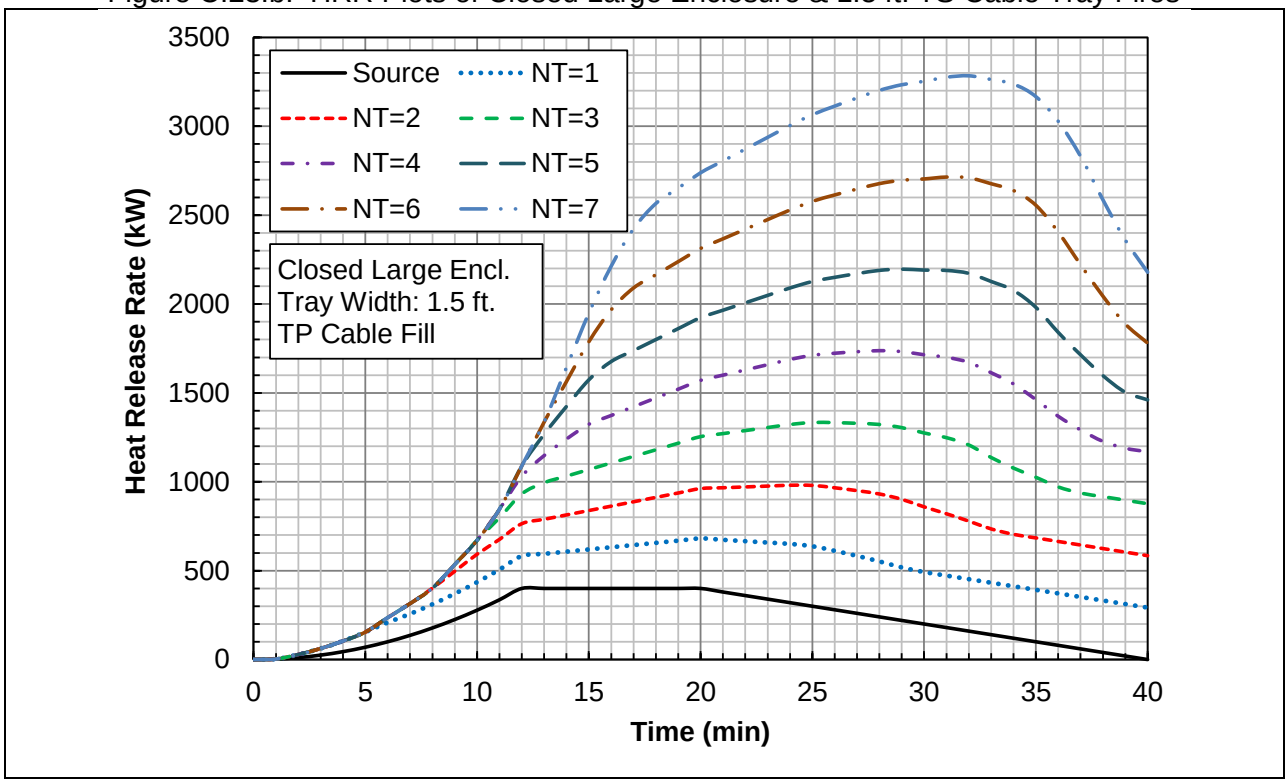

Figure C.23.c: HRR Plots of Closed Large Enclosure & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2	19	19	19	19	19	19	19	46	46	46	46	46	46	46
3	40	40	40	40	40	40	40	100	100	100	100	100	100	100
4	68	68	68	68	68	68	68	164	164	164	164	164	164	164
5	102	102	102	102	102	102	102	239	239	239	239	239	239	239
6	142	154	154	154	154	154	154	317	372	372	372	372	372	372
7	187	212	212	212	212	212	212	378	493	493	493	493	493	493
8	239	277	277	277	277	277	277	444	625	625	625	625	625	625
9	297	348	365	365	365	365	365	516	768	844	844	844	844	844
10	360	425	460	460	460	460	460	593	908	1065	1065	1065	1065	1065
11	430	509	561	583	583	583	583	676	1015	1259	1355	1355	1355	1355
12	505	599	670	713	740	740	740	765	1129	1463	1662	1779	1779	1779
13	517	626	715	781	835	866	866	790	1178	1590	1895	2134	2272	2272
14	525	649	757	847	927	990	1026	814	1227	1664	2081	2448	2729	2887
15	530	670	798	910	1018	1113	1185	839	1277	1738	2247	2747	3176	3498
16	535	691	839	975	1111	1238	1347	864	1326	1812	2346	2953	3535	4026
17	540	713	880	1041	1205	1365	1511	888	1375	1886	2445	3077	3781	4446
18	544	728	916	1100	1294	1487	1670	913	1425	1960	2544	3200	3929	4731
19	549	738	946	1156	1379	1605	1826	938	1474	2034	2642	3323	4077	4904
20	554	747	978	1213	1465	1725	1985	962	1524	2108	2741	3447	4226	5077
21	539	737	979	1240	1522	1817	2115	967	1553	2162	2820	3550	4354	5230
22	524	727	974	1261	1573	1903	2240	972	1582	2216	2899	3654	4482	5383
23	509	717	969	1269	1613	1977	2354	976	1612	2270	2977	3757	4610	5536
24	494	707	964	1269	1628	2028	2444	981	1641	2324	3056	3861	4738	5688
25	479	697	958	1269	1632	2050	2507	975	1660	2368	3124	3953	4855	5830
26	464	687	953	1268	1637	2059	2535	943	1653	2385	3166	4020	4947	5947
27	449	677	948	1268	1642	2069	2550	906	1640	2398	3204	4082	5034	6058
28	434	666	943	1268	1646	2079	2565	864	1623	2405	3236	4139	5115	6164
29	419	656	938	1268	1651	2088	2579	817	1583	2389	3245	4173	5173	6247
30	404	646	932	1267	1656	2098	2594	784	1518	2349	3229	4182	5207	6306
31	389	636	927	1267	1660	2108	2608	764	1460	2317	3221	4198	5249	6372
32	374	626	922	1267	1665	2117	2623	744	1398	2254	3183	4185	5260	6408
33	359	616	917	1267	1670	2127	2637	724	1330	2133	3087	4114	5213	6386
34	343	606	912	1266	1675	2136	2652	704	1289	2034	2981	4033	5157	6355
35	328	596	906	1266	1679	2146	2666	684	1269	1951	2825	3863	5012	6234
36	313	585	901	1266	1684	2156	2681	664	1249	1862	2657	3601	4730	5977
37	298	575	896	1266	1689	2165	2696	644	1229	1813	2524	3369	4383	5603
38	283	565	891	1265	1693	2175	2710	624	1209	1793	2415	3155	4049	5133
39	268	555	886	1265	1698	2185	2725	604	1189	1773	2358	2988	3757	4700
40	253	545	881	1265	1703	2194	2739	584	1169	1753	2338	2922	3561	4358

Figure C.24.a: Table of HRRs of Closed Large Enclosure & 3.0 ft. Cable Tray Fires

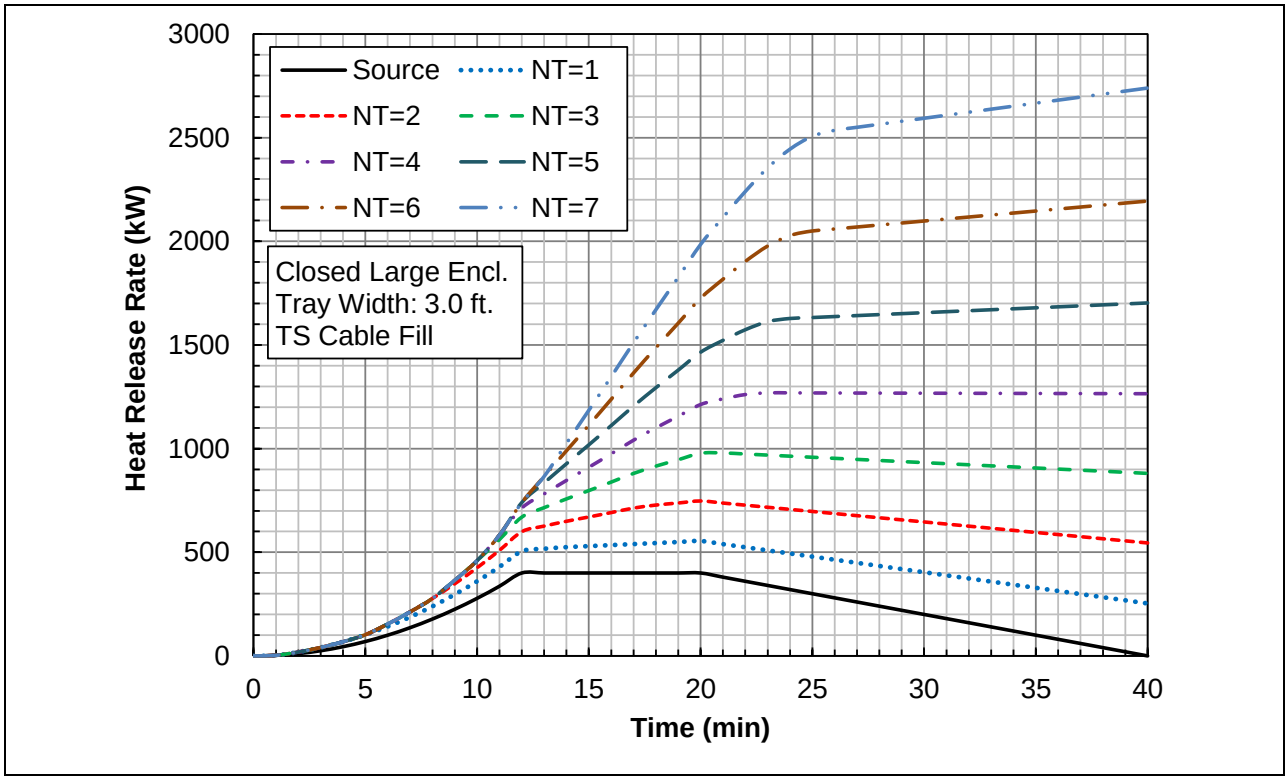

Figure C.24.b: HRR Plots of Closed Large Enclosure & 3.0 ft. TS Cable Tray Fires

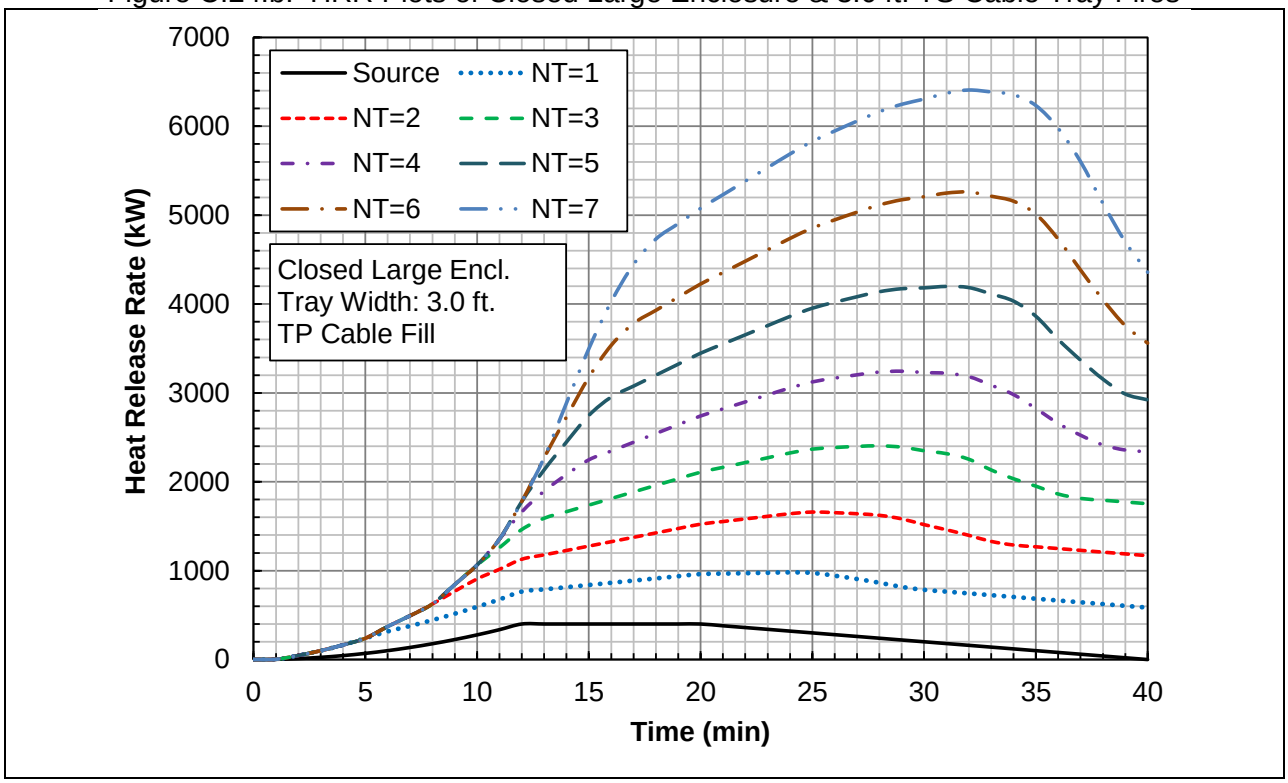

Figure C.24.c: HRR Plots of Closed Large Enclosure & 3.0 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	7	7	7	7	7	7	7	7	7	7	7	7	7	7
2	33	33	33	33	33	33	33	52	52	52	52	52	52	52
3	74	74	74	74	74	74	74	114	114	114	114	114	114	114
4	128	128	128	128	128	128	128	192	192	192	192	192	192	192
5	196	196	196	196	196	196	196	287	287	287	287	287	287	287
6	279	287	287	287	287	287	287	392	427	427	427	427	427	427
7	376	391	391	391	391	391	391	495	567	567	567	567	567	567
8	486	510	510	510	510	510	510	611	723	723	723	723	723	723
9	611	644	654	654	654	654	654	742	896	941	941	941	941	941
10	750	791	811	811	811	811	811	886	1077	1169	1169	1169	1169	1169
11	903	953	984	996	996	996	996	1044	1247	1390	1445	1445	1445	1445
12	1070	1129	1171	1196	1211	1211	1211	1216	1432	1627	1741	1806	1806	1806
13	1078	1146	1198	1236	1266	1283	1283	1228	1456	1696	1870	2004	2080	2080
14	1083	1160	1223	1274	1320	1354	1374	1241	1481	1733	1970	2175	2329	2415
15	1085	1172	1247	1311	1372	1424	1463	1253	1506	1770	2058	2336	2572	2747
16	1087	1184	1270	1348	1424	1494	1554	1265	1530	1807	2108	2445	2764	3031
17	1090	1196	1294	1386	1478	1566	1646	1278	1555	1844	2157	2506	2892	3253
18	1092	1204	1314	1420	1528	1634	1734	1290	1580	1881	2206	2568	2966	3401
19	1095	1209	1331	1451	1575	1700	1820	1302	1604	1918	2256	2630	3040	3488
20	1097	1214	1349	1482	1623	1766	1908	1315	1629	1955	2305	2692	3115	3574
21	1050	1169	1310	1458	1616	1778	1940	1277	1604	1942	2304	2703	3139	3610
22	1002	1124	1267	1430	1605	1786	1969	1239	1578	1929	2304	2715	3163	3647
23	955	1079	1225	1395	1587	1787	1991	1202	1553	1916	2303	2727	3187	3683
24	907	1034	1182	1355	1555	1774	2001	1164	1528	1903	2303	2738	3211	3720
25	860	989	1140	1315	1517	1746	1994	1119	1495	1882	2294	2742	3227	3748
26	812	944	1097	1275	1479	1711	1969	1056	1444	1844	2268	2729	3226	3759
27	765	899	1055	1235	1442	1676	1936	990	1391	1803	2240	2713	3222	3768
28	717	854	1012	1195	1404	1640	1903	922	1335	1760	2209	2694	3216	3774
29	670	808	969	1154	1366	1605	1871	851	1265	1703	2164	2661	3195	3766
30	622	763	927	1114	1329	1570	1838	792	1183	1632	2106	2616	3162	3745
31	574	718	884	1074	1291	1535	1805	742	1107	1569	2055	2577	3136	3731
32	527	673	842	1034	1253	1500	1773	692	1029	1488	1987	2521	3092	3700
33	479	628	799	994	1216	1464	1740	642	948	1374	1884	2431	3015	3635
34	432	583	756	954	1178	1429	1707	592	884	1274	1779	2338	2934	3567
35	384	538	714	914	1141	1394	1674	542	834	1185	1646	2197	2805	3450
36	337	493	671	874	1103	1359	1642	492	784	1094	1509	2005	2600	3257
37	289	448	629	833	1065	1324	1609	442	734	1027	1392	1831	2363	3004
38	242	403	586	793	1028	1289	1576	392	684	977	1290	1670	2135	2701
39	194	358	543	753	990	1253	1544	342	634	927	1219	1537	1931	2420
40	147	313	501	713	952	1218	1511	292	584	877	1169	1461	1783	2192

Figure C.25.a: Table of HRRs of Open Large Enclosure & 1.5 ft. Cable Tray Fires

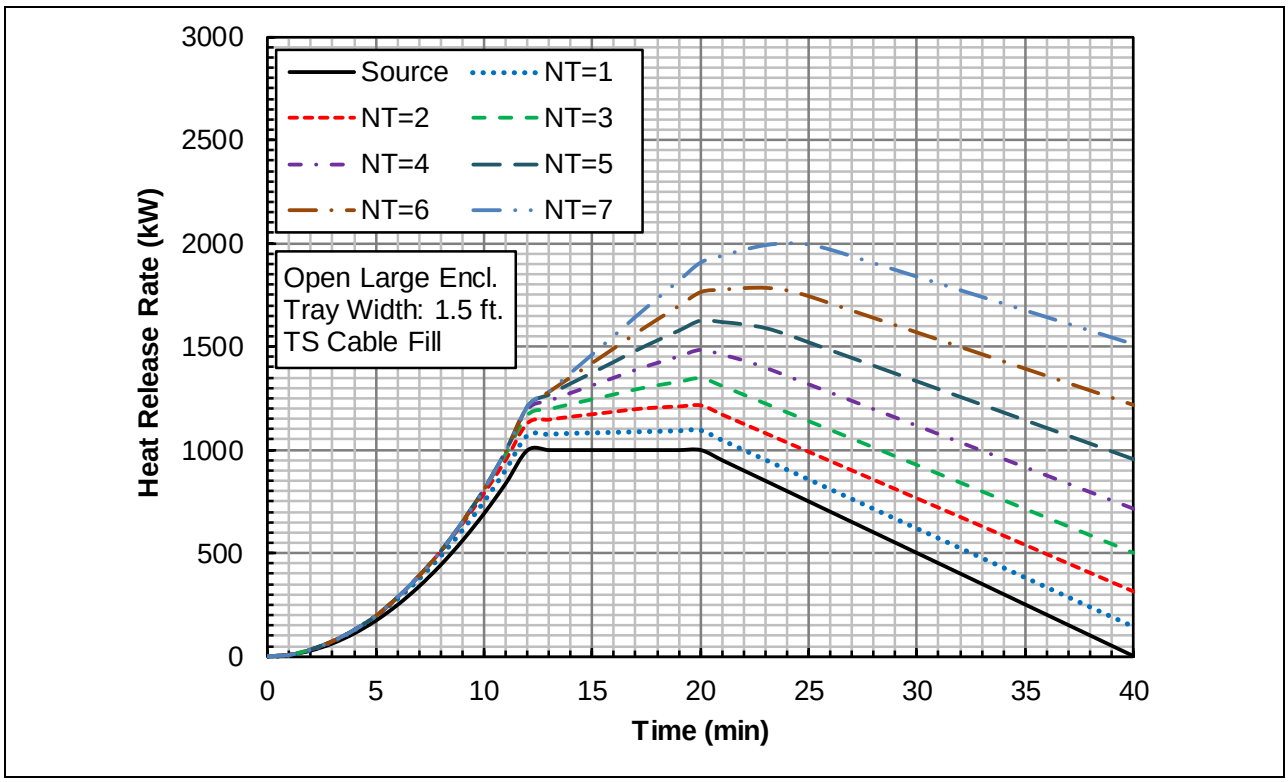

Figure C.25.b: HRR Plots of Open Large Enclosure & 1.5 ft. TS Cable Tray Fires

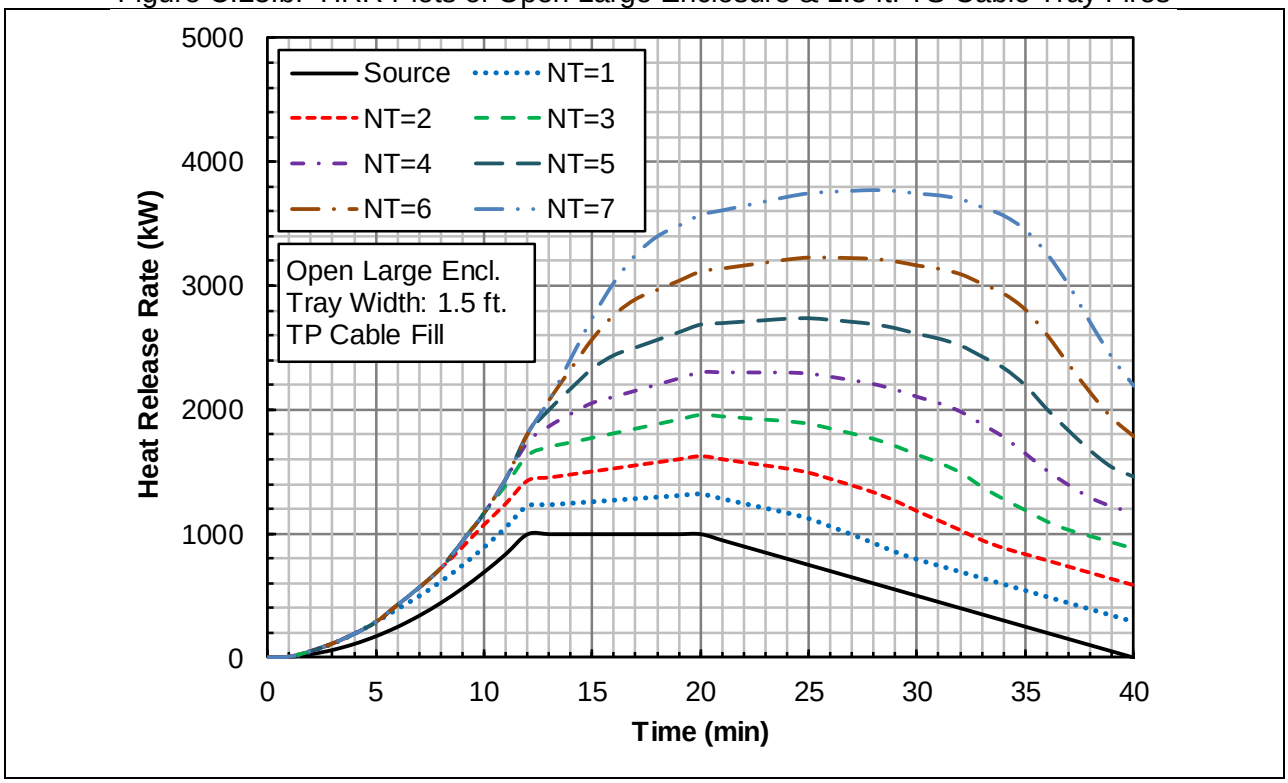

Figure C.25.c: HRR Plots of Open Large Enclosure & 1.5 ft. TP Cable Tray Fires

Time	HRR of Ignition Source and TS Trays (kW)							HRR of Ignition Source and TP Trays (kW)						
(min)	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7	NT=1	NT=2	NT=3	NT=4	NT=5	NT=6	NT=7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	7	7	7	7	7	7	7	7	7	7	7	7	7	7
2	39	39	39	39	39	39	39	77	77	77	77	77	77	77
3	85	85	85	85	85	85	85	165	165	165	165	165	165	165
4	145	145	145	145	145	145	145	273	273	273	273	273	273	273
5	219	219	219	219	219	219	219	400	400	400	400	400	400	400
6	308	324	324	324	324	324	324	534	603	603	603	603	603	603
7	411	443	443	443	443	443	443	649	793	793	793	793	793	793
8	528	576	576	576	576	576	576	778	1002	1002	1002	1002	1002	1002
9	660	725	745	745	745	745	745	921	1230	1320	1320	1320	1320	1320
10	806	888	928	928	928	928	928	1077	1459	1644	1644	1644	1644	1644
11	966	1065	1127	1152	1152	1152	1152	1248	1654	1940	2051	2051	2051	2051
12	1141	1258	1341	1391	1421	1421	1421	1432	1863	2255	2481	2613	2613	2613
13	1156	1291	1396	1473	1532	1567	1567	1457	1912	2392	2739	3007	3159	3159
14	1165	1319	1447	1549	1639	1708	1747	1481	1962	2466	2940	3349	3658	3831
15	1170	1343	1493	1622	1743	1848	1926	1506	2011	2540	3116	3673	4144	4495
16	1175	1368	1541	1696	1849	1989	2108	1531	2061	2614	3215	3889	4528	5062
17	1180	1392	1589	1772	1956	2132	2291	1556	2110	2688	3314	4013	4785	5506
18	1185	1408	1629	1840	2056	2268	2468	1580	2159	2762	3413	4136	4933	5802
19	1190	1418	1663	1902	2151	2400	2641	1605	2209	2836	3511	4260	5081	5975
20	1195	1428	1697	1965	2247	2533	2815	1630	2258	2910	3610	4383	5229	6148
21	1150	1388	1670	1967	2282	2606	2930	1604	2257	2934	3659	4457	5327	6271
22	1105	1348	1635	1961	2309	2671	3038	1579	2257	2958	3708	4530	5425	6394
23	1059	1308	1600	1940	2323	2723	3133	1554	2256	2982	3756	4604	5524	6516
24	1014	1268	1565	1910	2309	2749	3201	1528	2256	3006	3805	4677	5622	6639
25	969	1227	1529	1880	2284	2742	3238	1488	2239	3015	3838	4735	5704	6747
26	924	1187	1494	1850	2259	2722	3238	1412	2188	2988	3837	4758	5752	6819
27	879	1147	1459	1819	2233	2701	3222	1330	2132	2957	3829	4775	5794	6886
28	834	1107	1424	1789	2208	2681	3207	1244	2070	2920	3817	4788	5831	6948
29	789	1067	1389	1759	2183	2660	3192	1153	1981	2855	3777	4773	5841	6982
30	744	1027	1353	1729	2158	2640	3176	1084	1866	2765	3712	4732	5825	6991
31	699	987	1318	1698	2132	2620	3161	1034	1764	2688	3660	4704	5822	7012
32	654	947	1283	1668	2107	2599	3145	984	1658	2577	3573	4642	5785	7000
33	609	906	1248	1638	2082	2579	3130	934	1545	2397	3418	4512	5679	6919
34	564	866	1213	1608	2056	2559	3114	884	1469	2248	3258	4377	5569	6833
35	519	826	1178	1577	2031	2538	3099	834	1419	2121	3043	4144	5360	6649
36	474	786	1142	1547	2006	2518	3083	784	1369	1988	2817	3810	5001	6315
37	429	746	1107	1517	1980	2497	3068	734	1319	1903	2634	3513	4575	5858
38	384	706	1072	1487	1955	2477	3053	684	1269	1853	2481	3241	4169	5302
39	338	666	1037	1456	1930	2457	3037	634	1219	1803	2388	3024	3812	4790
40	293	626	1002	1426	1904	2436	3022	584	1169	1753	2338	2922	3566	4384

Figure C.26.a: Table of HRRs of Open Large Enclosure & 3.0 ft. Cable Tray Fires

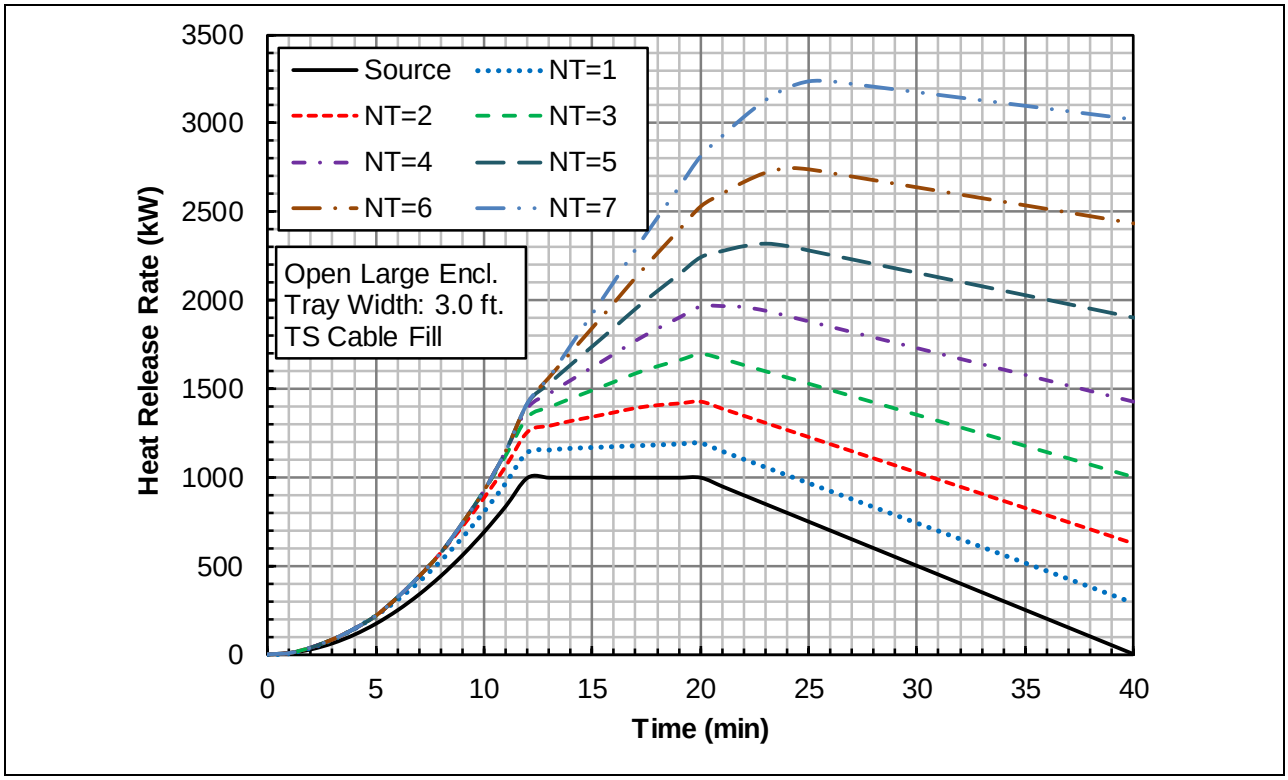

Figure C.26.b: HRR Plots of Open Large Enclosure & 3.0 ft. TS Cable Tray Fires

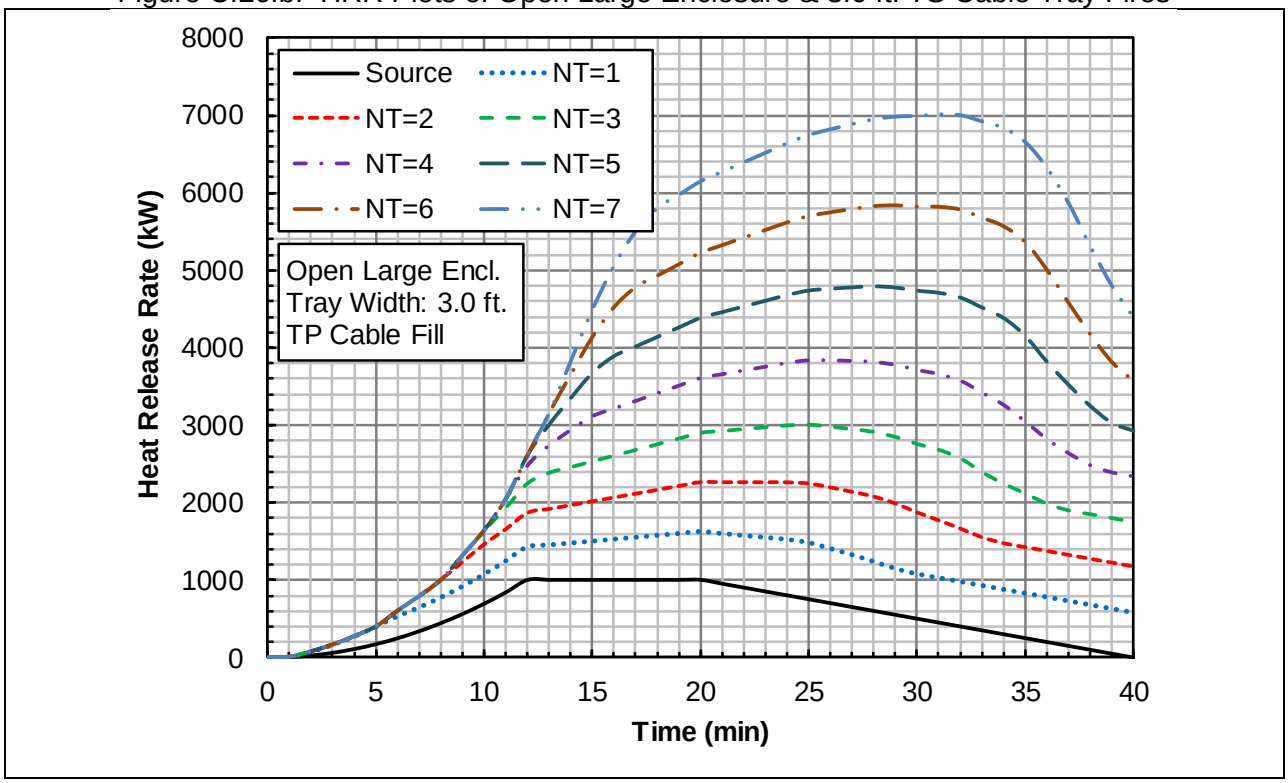

Figure C.26.c: HRR Plots of Open Large Enclosure & 3.0 ft. TP Cable Tray Fires

Appendix D. SEVERITY FACTOR VS. VERTICAL DISTANCE TO TARGET ABOVE IGNTION SOURCE

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Set D: Overview and Assumptions

To develop table/plot set D, calculations were performed to determine the highest elevation at which a target will be damaged or a secondary combustible will ignite when the ignition source reaches the HRR that corresponds to a specified Severity Factor (SF). Each table and plot provides the elevations corresponding to SFs ranging from 0.02 to 0.95 for one of the fixed or transient ignition sources listed in Attachment 5, located either in the open or in a corner. Table/plot set D is used to conservatively estimate the SF for a target or secondary combustible located within the vertical ZOI based on its elevation above the ignition source (Step 2.6.1).

The assumptions and background for the calculations performed to develop the tables and plots in set D are discussed in Section 06.03.04 of IMC 0308, Attachment 3, Appendix F. Since these calculations were based on FDT 9, the same assumptions were made as in the development of the tables and plots for the vertical ZOI of fixed and transient ignition sources in set A, with one exception. More specifically, the fire diameter for a given ignition source was assumed to be constant during the t^2 growth stage and equal to that assumed in the development of the tables and plots in set A, except during the period when the HRR is below one fifth of the 98^{th} percentile of the peak HRR. When the HRR is smaller than one fifth of the peak HRR, the fire diameter was reduced to keep the Froude number at 0.2, which is the lower limit of the validated range reported in NUREG-1824 Supplement 1.

SF	Distance from ignition source to target (ft.)		
	Motors	Pumps	Transients
0.02	4.2	6.6	7.8
0.05	3.8	5.7	7.0
0.10	3.4	4.9	6.3
0.15	3.2	4.4	5.8
0.20	3.0	4.0	5.4
0.25	2.8	3.6	5.1
0.30	2.7	3.3	4.8
0.35	2.5	3.0	4.5
0.40	2.4	2.7	4.3
0.45	2.3	2.5	4.0
0.50	2.1	2.4	3.8
0.55	2.0	2.2	3.6
0.60	1.9	2.1	3.3
0.65	1.8	1.9	3.1
0.70	1.7	1.8	3.0
0.75	1.6	1.6	2.8
0.80	1.5	1.4	2.6
0.85	1.4	1.2	2.4
0.90	1.2	1.0	2.2
0.95	1.1	0.7	1.8

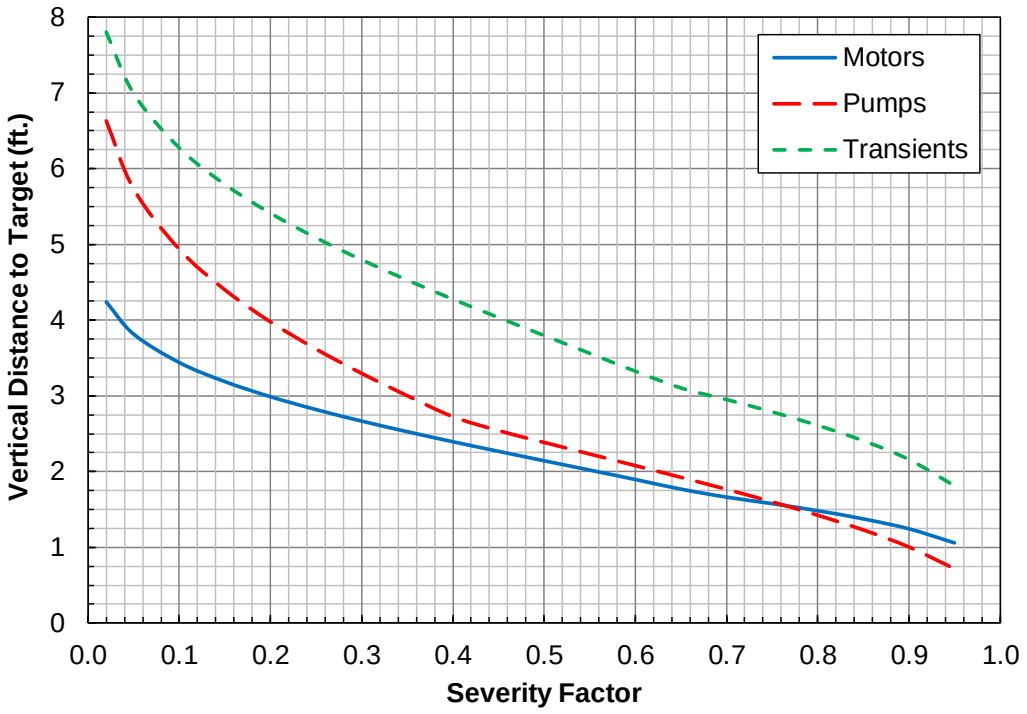

Figure D.01: Severity Factor vs. Vertical Target Distance for Motor, Pump and Transient Fires
(Free-Burn Configuration, TS Cable Targets)

SF	Distance from ignition source to target (ft.)		
	Motors	Pumps	Transients
0.02	7.1	11.1	13.1
0.05	6.4	9.5	11.6
0.10	5.7	8.1	10.4
0.15	5.3	7.2	9.6
0.20	4.9	6.5	8.9
0.25	4.6	5.9	8.3
0.30	4.4	5.3	7.8
0.35	4.1	4.8	7.4
0.40	3.9	4.3	6.9
0.45	3.7	4.0	6.5
0.50	3.4	3.8	6.1
0.55	3.2	3.5	5.7
0.60	3.0	3.3	5.3
0.65	2.8	3.0	4.9
0.70	2.6	2.8	4.6
0.75	2.5	2.5	4.4
0.80	2.3	2.2	4.1
0.85	2.2	1.9	3.8
0.90	2.0	1.6	3.4
0.95	1.7	1.1	2.9

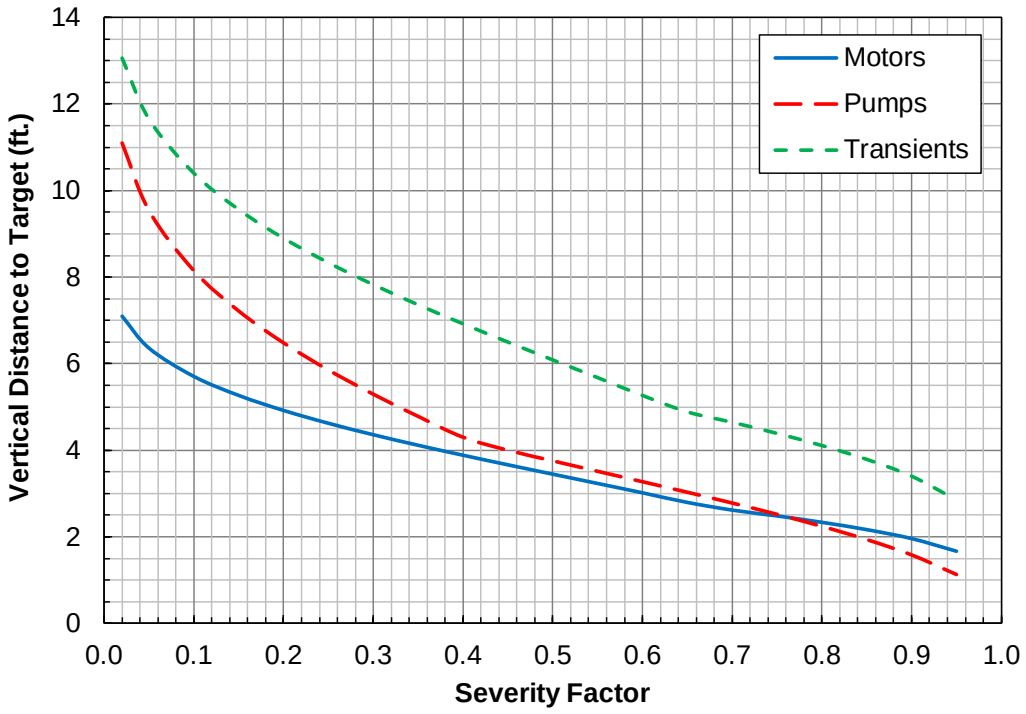

Figure D.02: Severity Factor vs. Vertical Target Distance for Motor, Pump and Transient Fires
(Corner Configuration, TS Cable Targets)

SF	Distance from ignition source to target (ft.)		
	Motors	Pumps	Transients
0.02	5.7	8.9	10.5
0.05	5.1	7.7	9.4
0.10	4.7	6.7	8.5
0.15	4.3	6.1	7.9
0.20	4.1	5.5	7.4
0.25	3.9	5.1	7.0
0.30	3.7	4.7	6.6
0.35	3.5	4.3	6.3
0.40	3.3	3.9	6.0
0.45	3.2	3.7	5.7
0.50	3.0	3.4	5.4
0.55	2.9	3.2	5.1
0.60	2.7	3.0	4.8
0.65	2.5	2.8	4.5
0.70	2.4	2.6	4.3
0.75	2.3	2.3	4.0
0.80	2.1	2.1	3.8
0.85	2.0	1.8	3.5
0.90	1.8	1.5	3.1
0.95	1.5	1.0	2.6

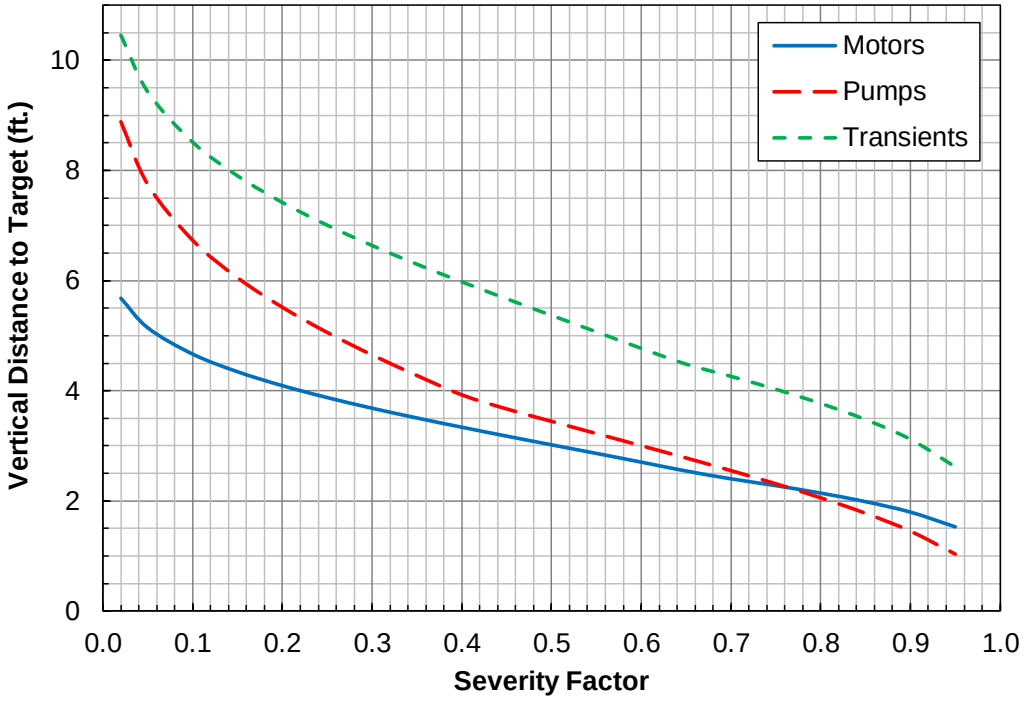

Figure D.03: Severity Factor vs. Vertical Target Distance for Motor, Pump and Transient Fires
(Free-Burn Configuration, TP Cable Targets)

SF	Distance from ignition source to target (ft.)		
	Motors	Pumps	Transients
0.02	9.6	15.0	17.7
0.05	8.7	13.0	15.9
0.10	7.8	11.3	14.3
0.15	7.3	10.1	13.2
0.20	6.8	9.2	12.4
0.25	6.5	8.4	11.7
0.30	6.1	7.7	11.0
0.35	5.8	7.0	10.4
0.40	5.5	6.4	9.9
0.45	5.2	6.0	9.3
0.50	5.0	5.6	8.8
0.55	4.7	5.2	8.3
0.60	4.4	4.9	7.8
0.65	4.1	4.5	7.3
0.70	3.9	4.1	6.9
0.75	3.7	3.8	6.5
0.80	3.5	3.3	6.1
0.85	3.2	2.9	5.7
0.90	2.9	2.4	5.1
0.95	2.5	1.7	4.3

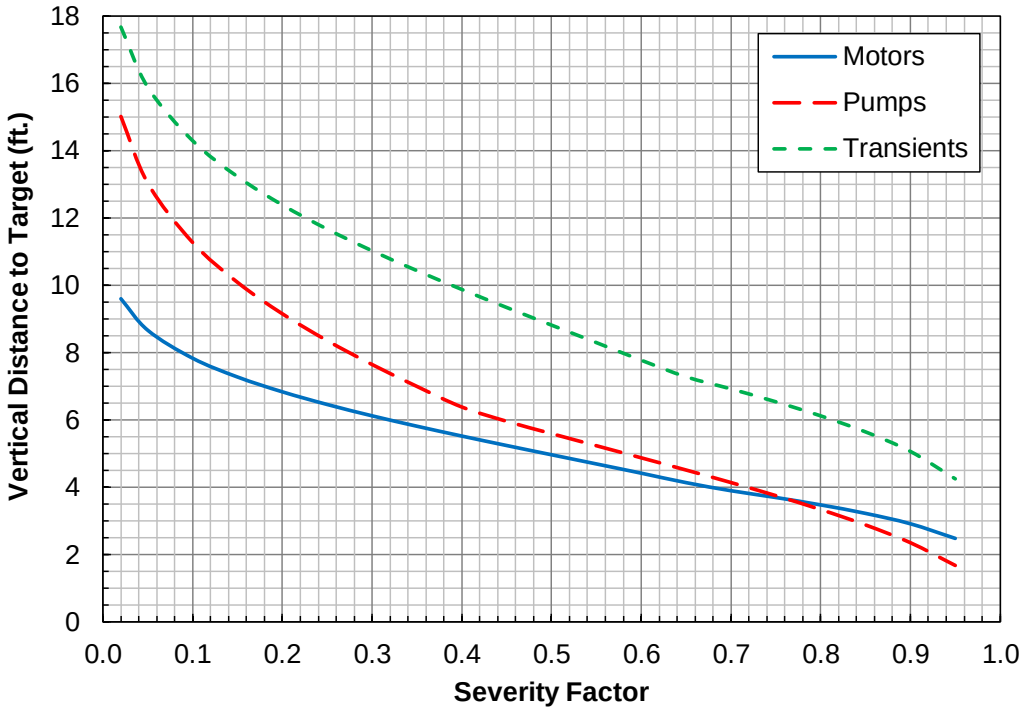

Figure D.04: Severity Factor vs. Vertical Target Distance for Motor, Pump and Transient Fires
(Corner Configuration, TP Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Small Electrical Enclosures	MCCs & Battery Chargers	Switchgear & Load Centers	Power Inverters
0.02	2.6	4.5	5.1	5.5
0.05	2.1	3.8	4.3	4.5
0.10	1.7	3.2	3.6	3.5
0.15	1.4	2.8	3.1	2.9
0.20	1.2	2.5	2.8	2.4
0.25	1.0	2.3	2.5	2.0
0.30	0.8	2.0	2.2	1.6
0.35	0.6	1.8	1.9	1.4
0.40	0.5	1.6	1.7	1.2
0.45	0.4	1.4	1.5	1.1
0.50	0.3	1.2	1.3	0.9
0.55	0.2	1.1	1.2	0.7
0.60	0.1	1.0	1.1	0.5
0.65	0.1	0.9	0.9	0.4
0.70		0.8	0.8	0.2
0.75		0.6	0.6	0.1
0.80		0.5	0.5	
0.85		0.3	0.3	
0.90		0.2	0.1	
0.95				

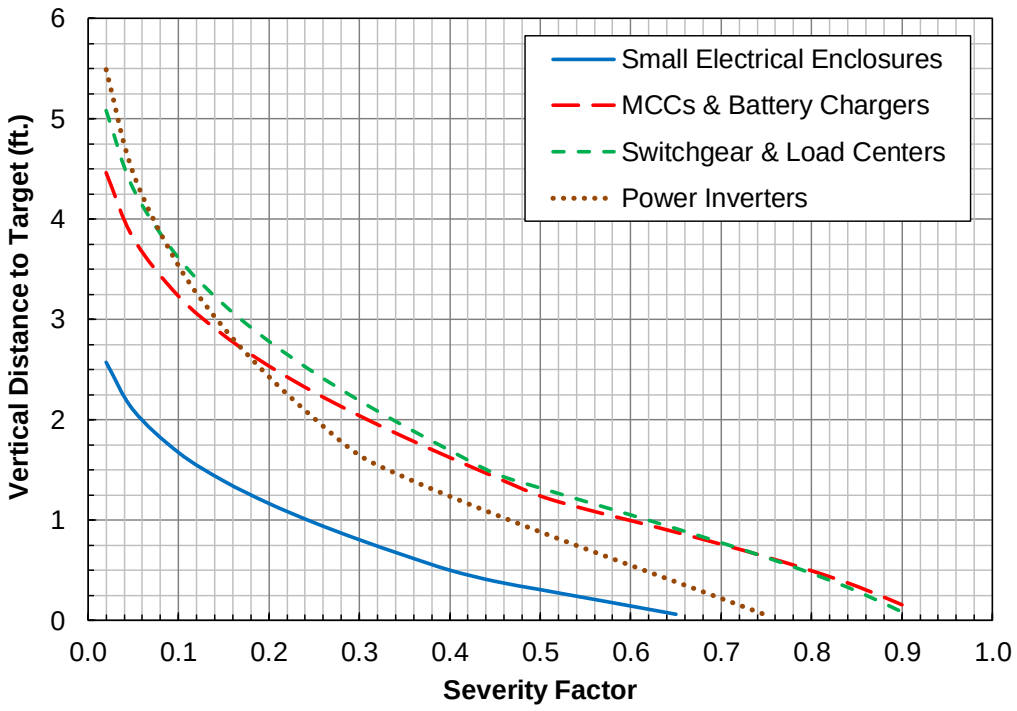

Figure D.05: Severity Factor vs. Vertical Target Distance for Electrical Enclosures (Set 1) (Free-Burn Configuration, TS Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Small Electrical Enclosures	MCCs & Battery Chargers	Switchgear & Load Centers	Power Inverters
0.02	5.0	8.1	9.2	9.9
0.05	4.2	7.0	7.8	8.1
0.10	3.4	6.0	6.6	6.5
0.15	2.9	5.3	5.8	5.4
0.20	2.5	4.8	5.2	4.5
0.25	2.2	4.3	4.6	3.8
0.30	1.9	3.9	4.1	3.2
0.35	1.6	3.6	3.7	2.8
0.40	1.4	3.2	3.3	2.5
0.45	1.2	2.9	2.9	2.2
0.50	1.1	2.5	2.7	2.0
0.55	0.9	2.3	2.4	1.7
0.60	0.8	2.1	2.2	1.4
0.65	0.7	2.0	2.0	1.2
0.70	0.5	1.8	1.8	0.9
0.75	0.4	1.6	1.6	0.7
0.80	0.3	1.4	1.3	0.4
0.85	0.1	1.1	1.0	0.1
0.90		0.8	0.7	
0.95		0.4	0.3	

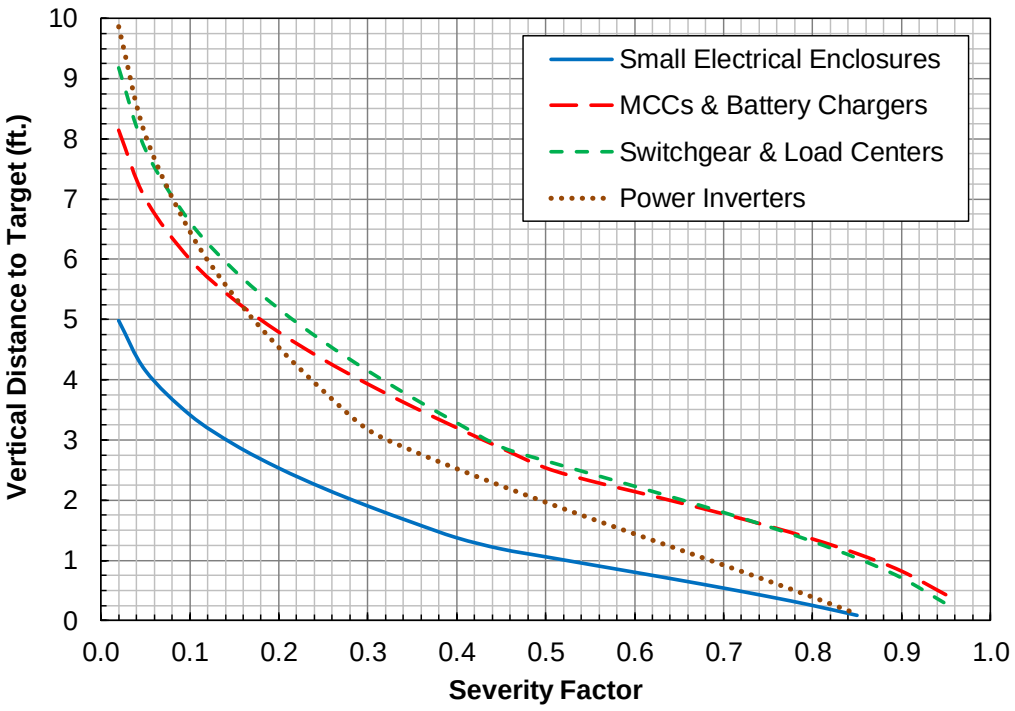

Figure D.06: Severity Factor vs. Vertical Target Distance for Electrical Enclosures (Set 1) (Corner Configuration, TS Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Small Electrical Enclosures	MCCs & Battery Chargers	Switchgear & Load Centers	Power Inverters
0.02	3.8	6.3	7.1	7.7
0.05	3.2	5.5	6.2	6.4
0.10	2.6	4.8	5.3	5.2
0.15	2.3	4.3	4.7	4.4
0.20	2.0	3.9	4.2	3.8
0.25	1.8	3.5	3.8	3.3
0.30	1.5	3.2	3.5	2.8
0.35	1.3	3.0	3.2	2.5
0.40	1.2	2.7	2.8	2.2
0.45	1.0	2.5	2.6	2.0
0.50	0.9	2.2	2.4	1.7
0.55	0.8	2.0	2.2	1.5
0.60	0.7	1.9	2.0	1.2
0.65	0.5	1.7	1.8	1.0
0.70	0.4	1.5	1.6	0.8
0.75	0.3	1.4	1.4	0.5
0.80	0.1	1.2	1.1	0.3
0.85		0.9	0.9	0.0
0.90		0.7	0.6	
0.95		0.3	0.2	

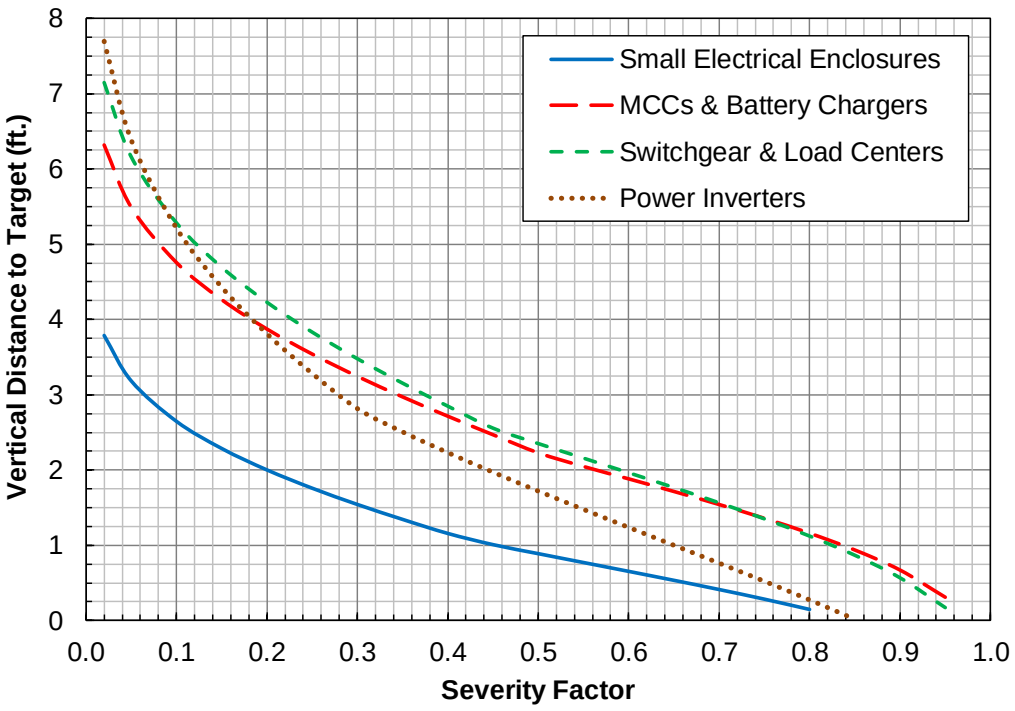

Figure D.07: Severity Factor vs. Vertical Target Distance for Electrical Enclosures (Set 1) (Free-Burn Configuration, TP Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Small Electrical Enclosures	MCCs & Battery Chargers	Switchgear & Load Centers	Power Inverters
0.02	7.1	11.4	12.8	13.7
0.05	6.0	9.9	11.1	11.4
0.10	5.1	8.7	9.5	9.4
0.15	4.5	7.8	8.5	8.0
0.20	4.0	7.1	7.7	6.9
0.25	3.6	6.5	7.0	6.0
0.30	3.2	6.0	6.4	5.2
0.35	2.8	5.5	5.8	4.7
0.40	2.5	5.1	5.3	4.3
0.45	2.3	4.7	4.8	3.8
0.50	2.1	4.3	4.4	3.4
0.55	1.9	4.0	4.1	3.0
0.60	1.7	3.7	3.8	2.6
0.65	1.5	3.4	3.5	2.3
0.70	1.3	3.1	3.2	1.9
0.75	1.1	2.8	2.8	1.5
0.80	0.9	2.5	2.5	1.1
0.85	0.6	2.1	2.0	0.7
0.90	0.3	1.7	1.5	0.2
0.95		1.1	0.9	

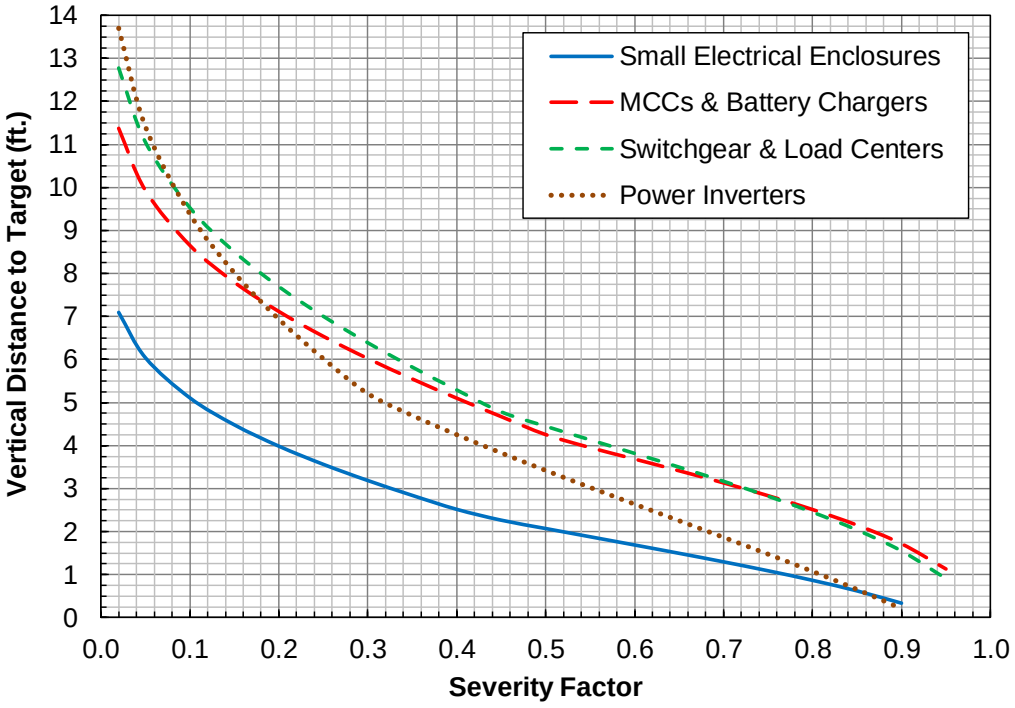

Figure D.08: Severity Factor vs. Vertical Target Distance for Electrical Enclosures (Set 1) (Corner Configuration, TP Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Medium Electrical Enclosures (Closed)	Medium Electical Enclosures (Open)	Large Electrical Enclosures (Closed)	Large Electrical Enclosures (Open)
0.02	5.5	6.9	7.6	11.4
0.05	4.5	5.6	6.2	9.2
0.10	3.5	4.5	5.0	7.2
0.15	2.9	3.7	4.2	5.9
0.20	2.4	3.1	3.5	4.9
0.25	2.0	2.6	3.0	4.0
0.30	1.6	2.2	2.5	3.5
0.35	1.4	1.9	2.2	3.1
0.40	1.2	1.7	2.0	2.7
0.45	1.1	1.5	1.7	2.3
0.50	0.9	1.3	1.5	2.0
0.55	0.7	1.1	1.3	1.6
0.60	0.5	0.9	1.0	1.3
0.65	0.4	0.7	0.8	1.0
0.70	0.2	0.5	0.6	0.7
0.75	0.1	0.3	0.4	0.4
0.80		0.0	0.2	0.1
0.85				
0.90				
0.95				

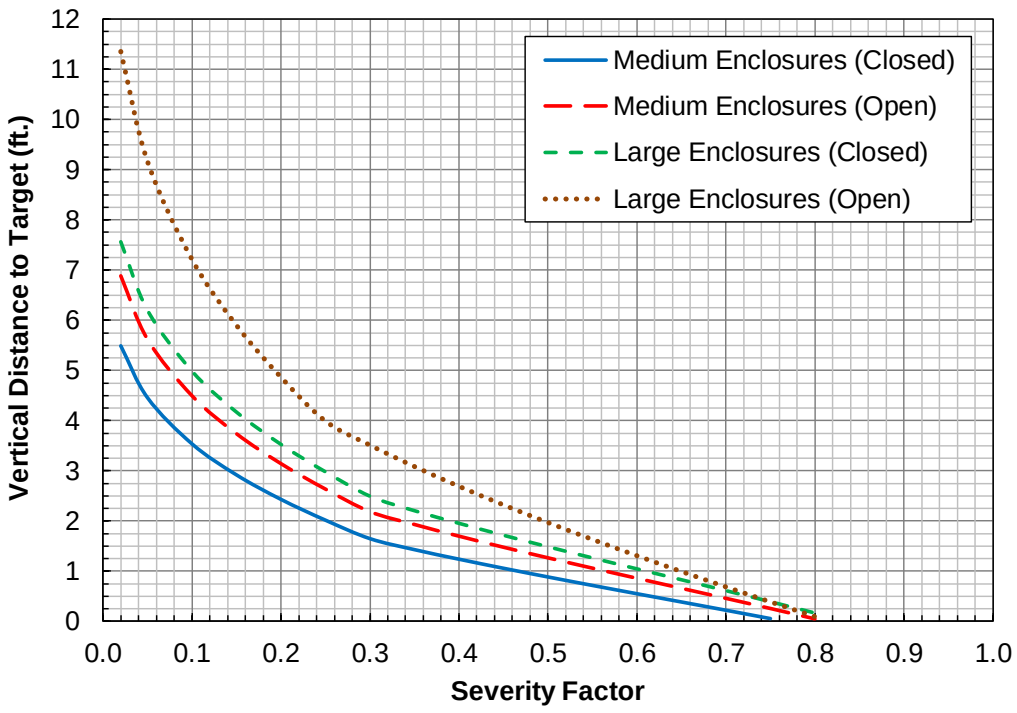

Figure D.09: Severity Factor vs. Vertical Target Distance for Electrical Enclosures (Set 2) (Free-Burn Configuration, TS Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Medium Electrical Enclosures (Closed)	Medium Electical Enclosures (Open)	Large Electrical Enclosures (Closed)	Large Electrical Enclosures (Open)
0.02	9.9	12.2	13.3	19.7
0.05	8.1	10.0	11.0	15.9
0.10	6.5	8.0	8.8	12.5
0.15	5.4	6.7	7.4	10.2
0.20	4.5	5.7	6.3	8.4
0.25	3.8	4.8	5.4	6.9
0.30	3.2	4.0	4.5	6.1
0.35	2.8	3.6	4.0	5.4
0.40	2.5	3.2	3.6	4.8
0.45	2.2	2.9	3.3	4.2
0.50	2.0	2.6	2.9	3.7
0.55	1.7	2.2	2.6	3.1
0.60	1.4	1.9	2.2	2.6
0.65	1.2	1.6	1.9	2.1
0.70	0.9	1.3	1.5	1.7
0.75	0.7	1.0	1.2	1.2
0.80	0.4	0.7	0.8	0.7
0.85	0.1	0.3	0.5	0.3
0.90			0.1	
0.95				

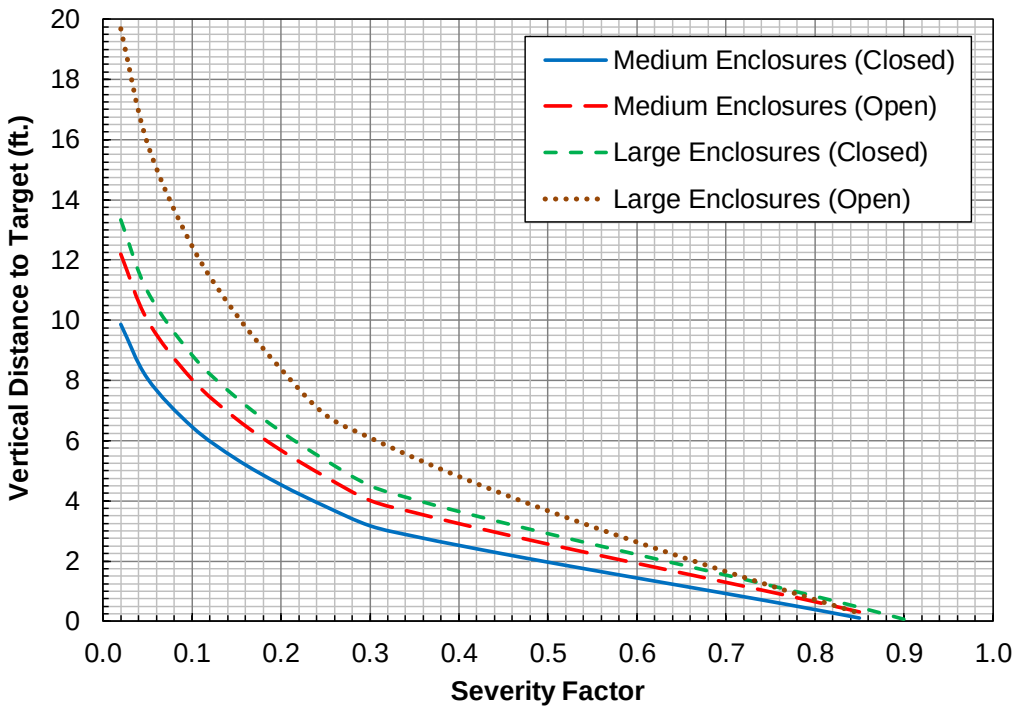

Figure D.10: Severity Factor vs. Vertical Target Distance for Electrical Enclosures (Set 2) (Corner Configuration, TS Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Medium Electrical Enclosures (Closed)	Medium Electical Enclosures (Open)	Large Electrical Enclosures (Closed)	Large Electrical Enclosures (Open)
0.02	7.7	9.6	10.5	15.6
0.05	6.4	8.0	8.7	12.8
0.10	5.2	6.5	7.2	10.3
0.15	4.4	5.6	6.2	8.6
0.20	3.8	4.8	5.3	7.3
0.25	3.3	4.2	4.7	6.2
0.30	2.8	3.6	4.0	5.5
0.35	2.5	3.2	3.6	4.9
0.40	2.2	2.9	3.3	4.3
0.45	2.0	2.6	2.9	3.8
0.50	1.7	2.3	2.6	3.3
0.55	1.5	2.0	2.3	2.8
0.60	1.2	1.7	2.0	2.3
0.65	1.0	1.4	1.6	1.9
0.70	0.8	1.1	1.3	1.4
0.75	0.5	0.8	1.0	1.0
0.80	0.3	0.5	0.7	0.6
0.85	0.0	0.2	0.3	0.2
0.90				
0.95				

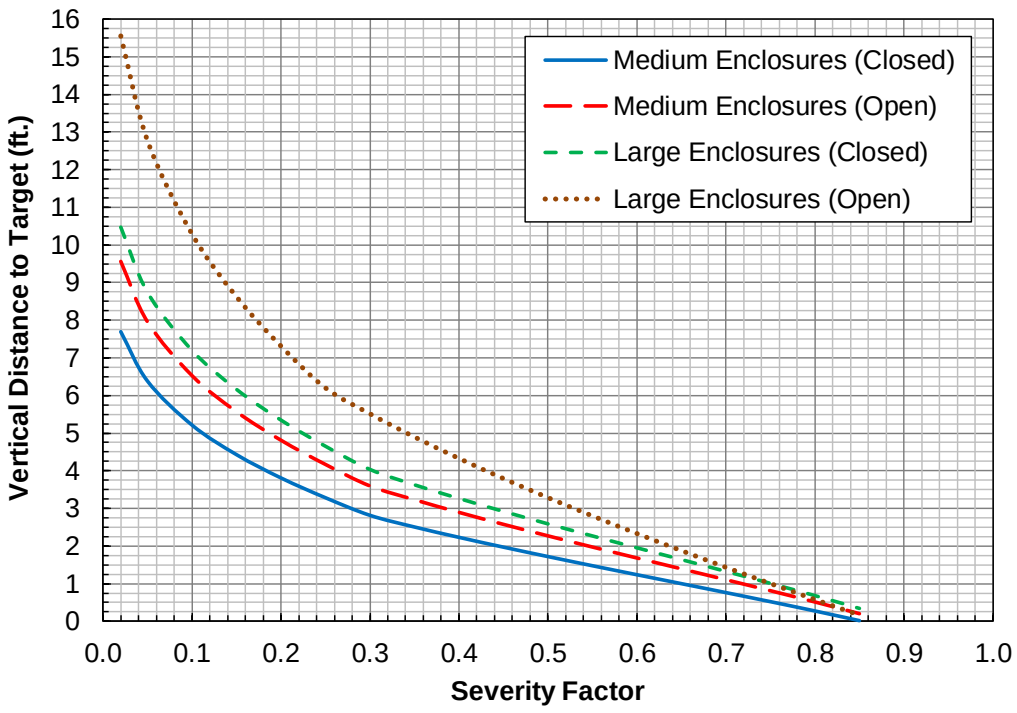

Figure D.11: Severity Factor vs. Vertical Target Distance for Electrical Enclosures (Set 2) (Free-Burn Configuration, TP Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Medium Electrical Enclosures (Closed)	Medium Electical Enclosures (Open)	Large Electrical Enclosures (Closed)	Large Electrical Enclosures (Open)
0.02	13.7	16.9	18.4	27.0
0.05	11.4	14.1	15.4	22.1
0.10	9.4	11.6	12.7	17.8
0.15	8.0	9.9	10.9	14.9
0.20	6.9	8.6	9.5	12.6
0.25	6.0	7.5	8.3	10.7
0.30	5.2	6.5	7.2	9.6
0.35	4.7	5.9	6.5	8.6
0.40	4.3	5.3	5.9	7.7
0.45	3.8	4.8	5.4	6.8
0.50	3.4	4.3	4.8	6.0
0.55	3.0	3.8	4.3	5.2
0.60	2.6	3.4	3.8	4.4
0.65	2.3	2.9	3.3	3.7
0.70	1.9	2.4	2.8	3.0
0.75	1.5	1.9	2.3	2.3
0.80	1.1	1.5	1.7	1.6
0.85	0.7	1.0	1.2	0.9
0.90	0.2	0.4	0.6	0.2
0.95				

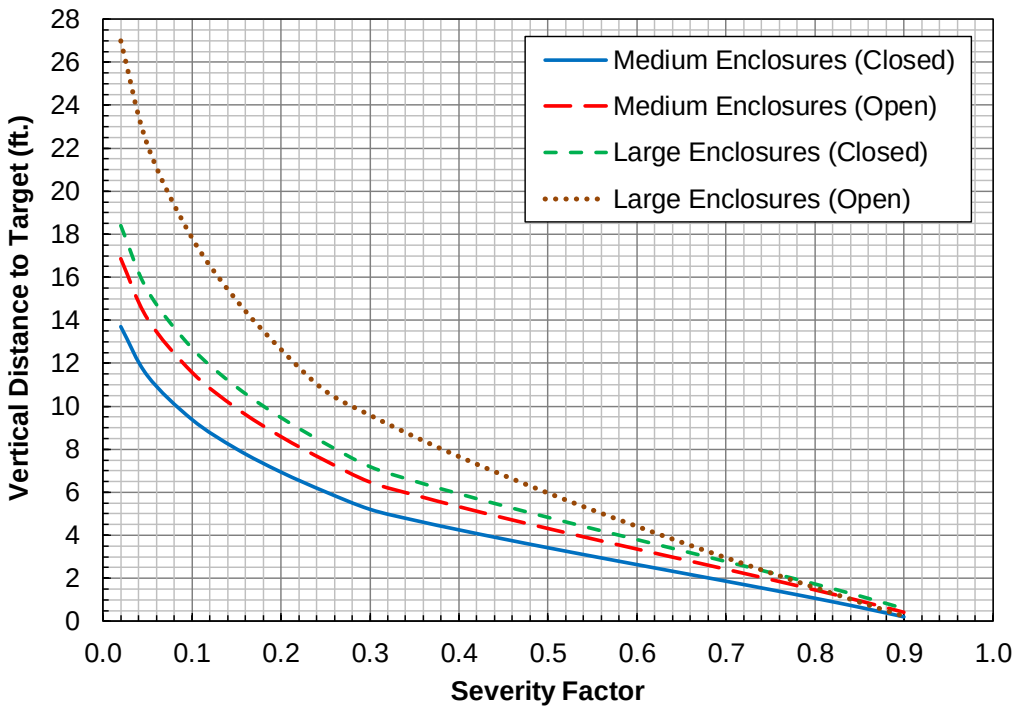

Figure D.12: Severity Factor vs. Vertical Target Distance for Electrical Enclosures (Set 2) (Corner Configuration, TP Cable Targets)

Appendix E. SEVERITY FACTOR VS. RADIAL DISTANCE FROM IGNTION SOURCE TO TARGET

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Set E: Overview and Assumptions

To develop table/plot set E, calculations were performed to determine the longest radial distance at which a target will be damaged or a secondary combustible will ignite when the ignition source reaches the HRR that corresponds to a specified SF. Each table and plot provides the radial distances corresponding to SFs ranging from 0.02 to 0.95 for one of the fixed or transient ignition sources listed in Attachment 5. Table/plot set E is used to conservatively estimate the SF for a target or secondary combustible located within the radial ZOI based on its distance from the ignition source (Step 2.6.1).

The assumptions and background for the calculations performed to develop the tables and plots in set E are discussed in Section 06.03.05 of IMC 0308, Attachment 3, Appendix F. Since these calculations were based on FDT 5 (Point Source Model), the same assumptions were made as in the development of the tables and plots for the radial ZOI of fixed and transient ignition sources in set A.

SF	Distance from ignition source to target (ft.)		
	Motors	Pumps	Transients
0.02	1.25	2.18	2.67
0.05	1.12	1.89	2.40
0.10	1.02	1.64	2.16
0.15	0.95	1.48	2.01
0.20	0.89	1.35	1.89
0.25	0.85	1.25	1.78
0.30	0.81	1.15	1.69
0.35	0.77	1.07	1.61
0.40	0.73	0.99	1.53
0.45	0.70	0.92	1.46
0.50	0.67	0.85	1.39
0.55	0.64	0.78	1.32
0.60	0.61	0.72	1.25
0.65	0.57	0.65	1.18
0.70	0.54	0.58	1.11
0.75	0.51	0.52	1.03
0.80	0.47	0.45	0.95
0.85	0.43	0.37	0.86
0.90	0.38	0.29	0.75
0.95	0.31	0.19	0.60

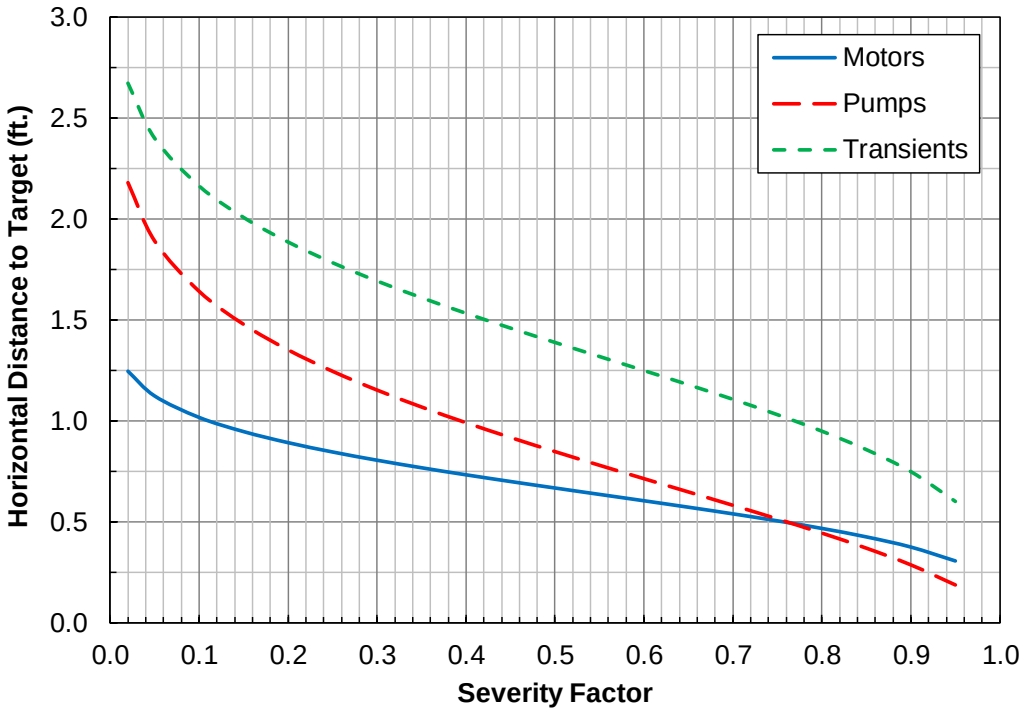

Figure E.01: Severity Factor vs. Radial Target Distance for Motor, Pump and Transient Fires (TS Cable Targets)

SF	Distance from ignition source to target (ft.)		
	Motors	Pumps	Transients
0.02	1.76	3.08	3.78
0.05	1.59	2.68	3.39
0.10	1.44	2.32	3.06
0.15	1.34	2.09	2.84
0.20	1.26	1.91	2.67
0.25	1.20	1.76	2.52
0.30	1.14	1.63	2.40
0.35	1.09	1.51	2.28
0.40	1.04	1.40	2.17
0.45	0.99	1.30	2.07
0.50	0.95	1.20	1.97
0.55	0.90	1.11	1.87
0.60	0.86	1.01	1.77
0.65	0.81	0.92	1.67
0.70	0.76	0.82	1.57
0.75	0.72	0.73	1.46
0.80	0.66	0.63	1.34
0.85	0.60	0.52	1.21
0.90	0.53	0.41	1.06
0.95	0.44	0.27	0.85

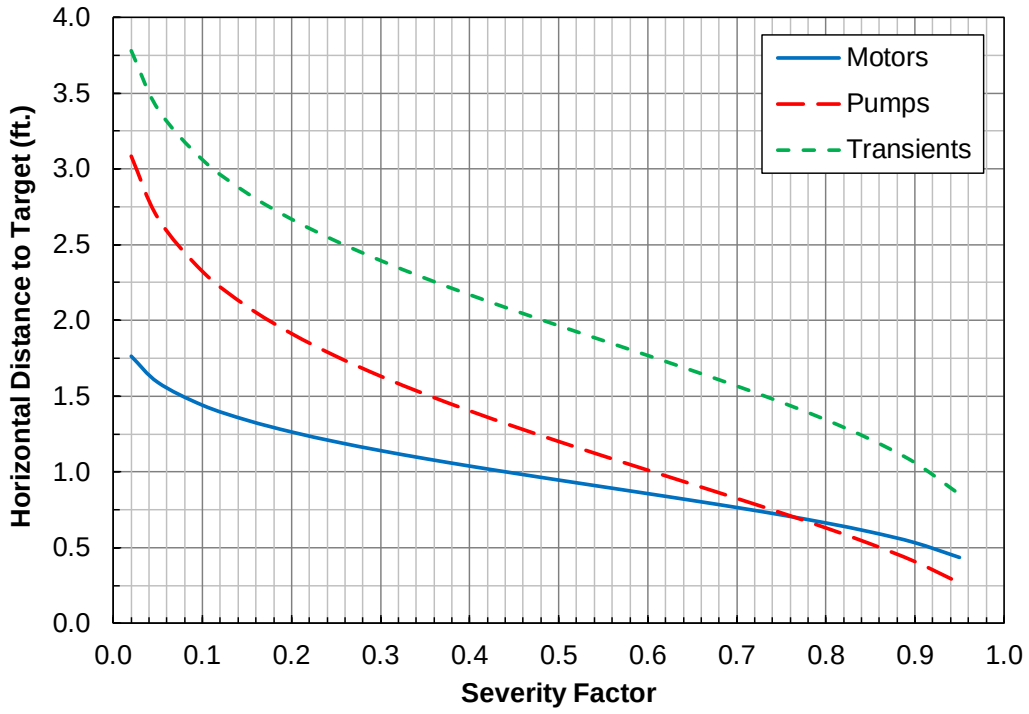

Figure E.02: Severity Factor vs. Radial Target Distance for Motor, Pump and Transient Fires (TP Cable Targets)

SF	Distance from ignition source to target (ft.)		
	Motors	Pumps	Transients
0.02	2.52	4.40	5.39
0.05	2.27	3.82	4.84
0.10	2.05	3.31	4.37
0.15	1.91	2.99	4.05
0.20	1.80	2.73	3.81
0.25	1.71	2.52	3.60
0.30	1.63	2.33	3.42
0.35	1.55	2.16	3.25
0.40	1.48	2.00	3.10
0.45	1.41	1.85	2.95
0.50	1.35	1.71	2.80
0.55	1.29	1.58	2.66
0.60	1.22	1.44	2.52
0.65	1.16	1.31	2.38
0.70	1.09	1.18	2.24
0.75	1.02	1.04	2.08
0.80	0.95	0.90	1.92
0.85	0.86	0.75	1.73
0.90	0.76	0.58	1.51
0.95	0.62	0.38	1.22

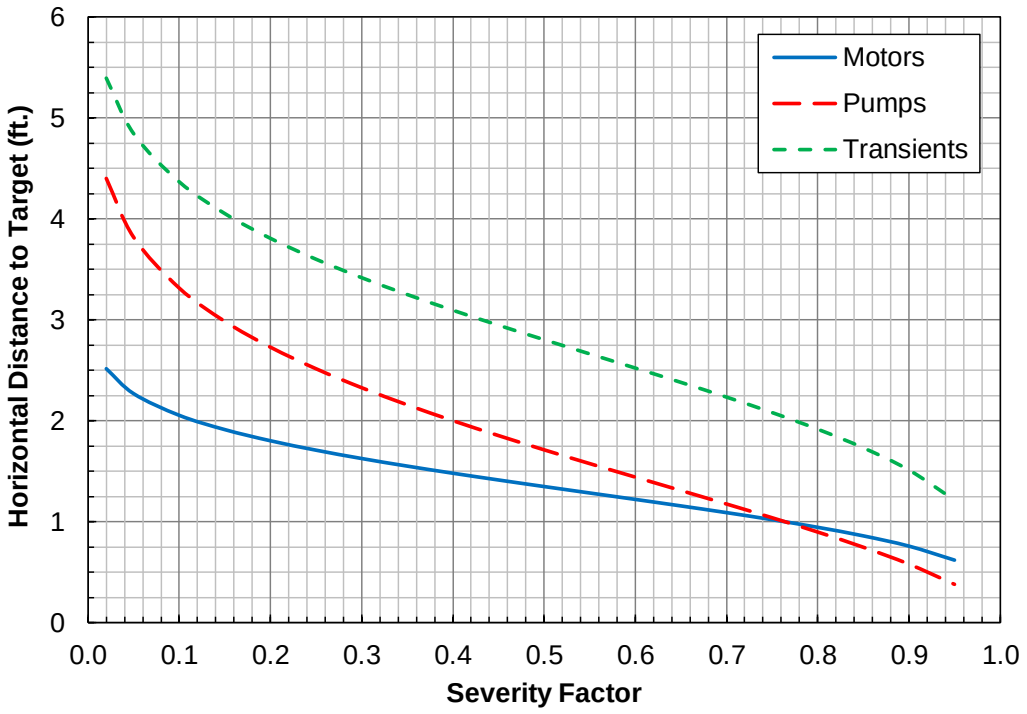

Figure E.03: Severity Factor vs. Radial Target Distance for Motor, Pump and Transient Fires (SE Targets)

SF	Distance from ignition source to target (ft.)			
	Small Electrical Enclosures	MCCs & Battery Chargers	Switchgear & Load Centers	Power Inverters
0.02	1.01	1.71	1.96	2.12
0.05	0.88	1.51	1.71	1.79
0.10	0.76	1.34	1.50	1.51
0.15	0.69	1.22	1.36	1.32
0.20	0.63	1.14	1.25	1.18
0.25	0.58	1.06	1.16	1.06
0.30	0.54	1.00	1.08	0.96
0.35	0.50	0.94	1.01	0.87
0.40	0.47	0.88	0.94	0.78
0.45	0.43	0.83	0.88	0.71
0.50	0.40	0.78	0.82	0.63
0.55	0.37	0.73	0.76	0.56
0.60	0.34	0.68	0.70	0.50
0.65	0.31	0.63	0.65	0.43
0.70	0.28	0.58	0.59	0.37
0.75	0.25	0.53	0.53	0.31
0.80	0.22	0.47	0.46	0.25
0.85	0.18	0.41	0.40	0.18
0.90	0.14	0.34	0.32	0.12
0.95	0.09	0.25	0.22	0.06

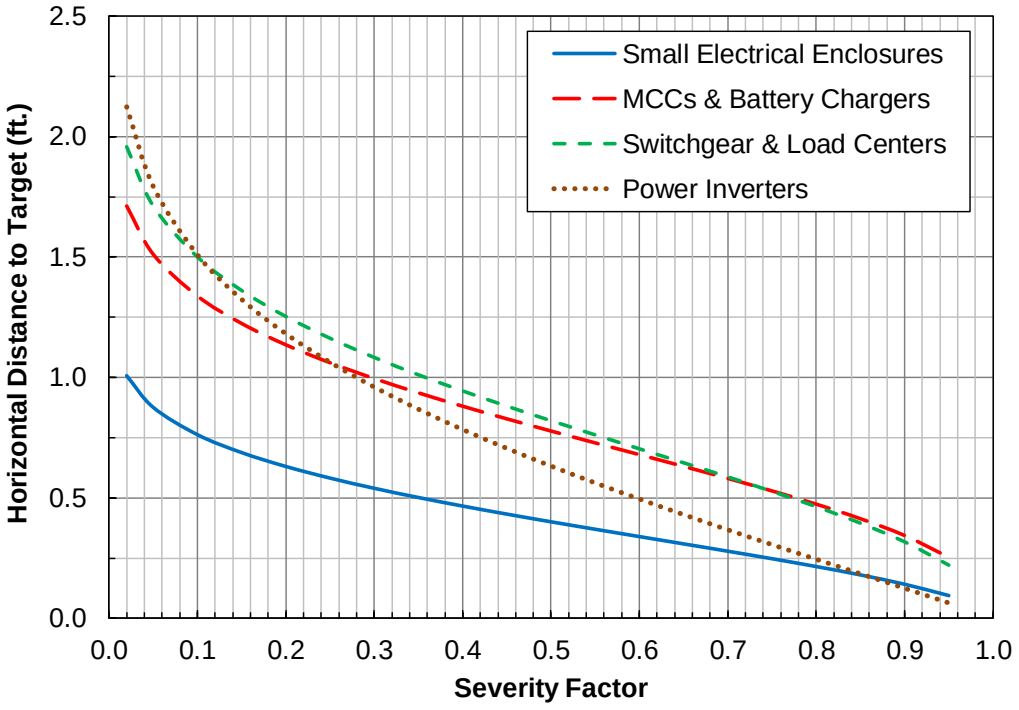

Figure E.04: Severity Factor vs. Radial Target Distance for Electrical Enclosures (Set 1) (TS Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Small Electrical Enclosures	MCCs & Battery Chargers	Switchgear & Load Centers	Power Inverters
0.02	1.42	2.42	2.77	3.00
0.05	1.24	2.14	2.42	2.54
0.10	1.08	1.89	2.12	2.13
0.15	0.97	1.73	1.93	1.87
0.20	0.89	1.61	1.77	1.67
0.25	0.82	1.50	1.64	1.50
0.30	0.76	1.41	1.53	1.36
0.35	0.71	1.32	1.43	1.23
0.40	0.66	1.25	1.34	1.11
0.45	0.61	1.17	1.25	1.00
0.50	0.57	1.10	1.16	0.89
0.55	0.52	1.03	1.08	0.80
0.60	0.48	0.96	1.00	0.70
0.65	0.44	0.89	0.91	0.61
0.70	0.39	0.82	0.83	0.52
0.75	0.35	0.75	0.75	0.43
0.80	0.30	0.67	0.66	0.35
0.85	0.25	0.59	0.56	0.26
0.90	0.20	0.49	0.45	0.18
0.95	0.13	0.36	0.31	0.09

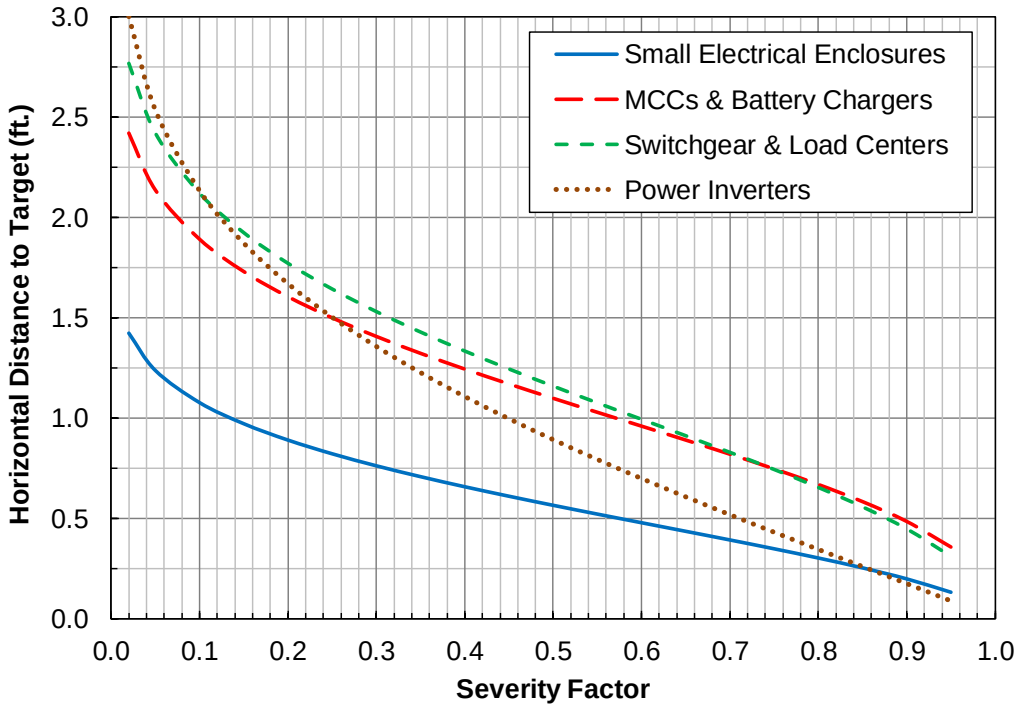

Figure E.05: Severity Factor vs. Radial Target Distance for Electrical Enclosures (Set 1) (TP Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Small Electrical Enclosures	MCCs & Battery Chargers	Switchgear & Load Centers	Power Inverters
0.02	2.03	3.45	3.95	4.28
0.05	1.77	3.05	3.45	3.62
0.10	1.54	2.70	3.03	3.05
0.15	1.39	2.47	2.75	2.67
0.20	1.27	2.29	2.53	2.38
0.25	1.17	2.14	2.35	2.15
0.30	1.09	2.01	2.19	1.94
0.35	1.01	1.89	2.04	1.75
0.40	0.94	1.78	1.91	1.58
0.45	0.87	1.67	1.78	1.42
0.50	0.81	1.57	1.66	1.28
0.55	0.75	1.47	1.54	1.13
0.60	0.68	1.37	1.42	1.00
0.65	0.62	1.27	1.30	0.87
0.70	0.56	1.17	1.18	0.74
0.75	0.50	1.07	1.06	0.62
0.80	0.43	0.96	0.94	0.49
0.85	0.36	0.83	0.80	0.37
0.90	0.29	0.69	0.64	0.25
0.95	0.19	0.51	0.45	0.13

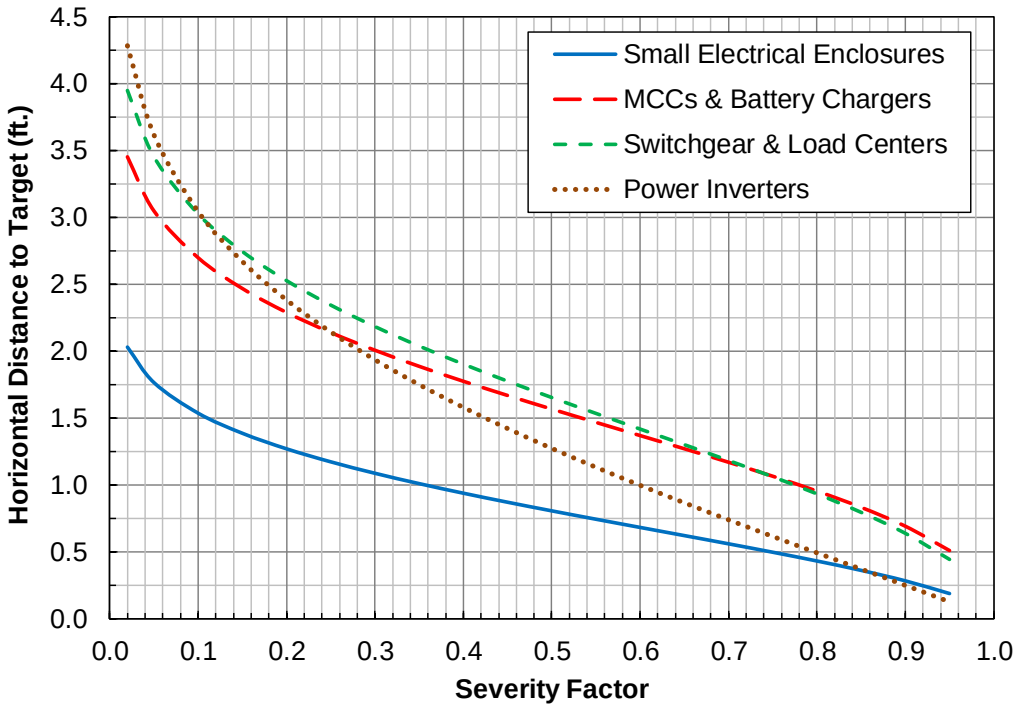

Figure E.06: Severity Factor vs. Radial Target Distance for Electrical Enclosures (Set 1) (SE Targets)

SF	Distance from ignition source to target (ft.)			
	Medium Electrical Enclosures (Closed)	Medium Electical Enclosures (Open)	Large Electrical Enclosures (Closed)	Large Electrical Enclosures (Open)
0.02	2.12	2.71	3.00	4.75
0.05	1.79	2.28	2.54	3.93
0.10	1.51	1.92	2.13	3.22
0.15	1.32	1.68	1.87	2.77
0.20	1.18	1.50	1.67	2.42
0.25	1.06	1.35	1.50	2.13
0.30	0.96	1.22	1.36	1.88
0.35	0.87	1.10	1.23	1.66
0.40	0.78	0.99	1.11	1.46
0.45	0.71	0.89	1.00	1.28
0.50	0.63	0.80	0.89	1.12
0.55	0.56	0.71	0.80	0.96
0.60	0.50	0.62	0.70	0.81
0.65	0.43	0.54	0.61	0.68
0.70	0.37	0.46	0.52	0.55
0.75	0.31	0.38	0.43	0.43
0.80	0.25	0.30	0.35	0.32
0.85	0.18	0.23	0.26	0.22
0.90	0.12	0.15	0.18	0.13
0.95	0.06	0.08	0.09	0.05

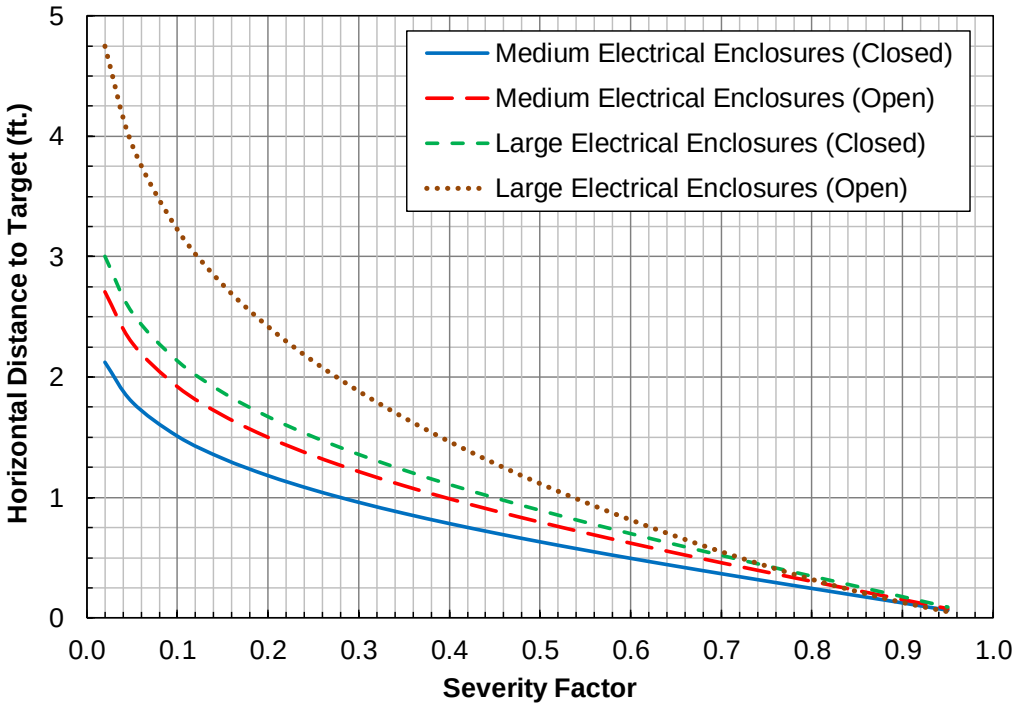

Figure E.07: Severity Factor vs. Radial Target Distance for Electrical Enclosures (Set 2) (TS Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Medium Electrical Enclosures (Closed)	Medium Electical Enclosures (Open)	Large Electrical Enclosures (Closed)	Large Electrical Enclosures (Open)
0.02	3.00	3.83	4.25	6.71
0.05	2.54	3.23	3.59	5.56
0.10	2.13	2.72	3.02	4.56
0.15	1.87	2.38	2.65	3.91
0.20	1.67	2.12	2.36	3.42
0.25	1.50	1.91	2.13	3.01
0.30	1.36	1.72	1.92	2.66
0.35	1.23	1.55	1.74	2.35
0.40	1.11	1.40	1.57	2.07
0.45	1.00	1.26	1.41	1.81
0.50	0.89	1.13	1.26	1.58
0.55	0.80	1.00	1.12	1.36
0.60	0.70	0.88	0.99	1.15
0.65	0.61	0.76	0.86	0.96
0.70	0.52	0.65	0.74	0.78
0.75	0.43	0.54	0.61	0.61
0.80	0.35	0.43	0.49	0.45
0.85	0.26	0.32	0.37	0.31
0.90	0.18	0.22	0.25	0.18
0.95	0.09	0.11	0.13	0.07

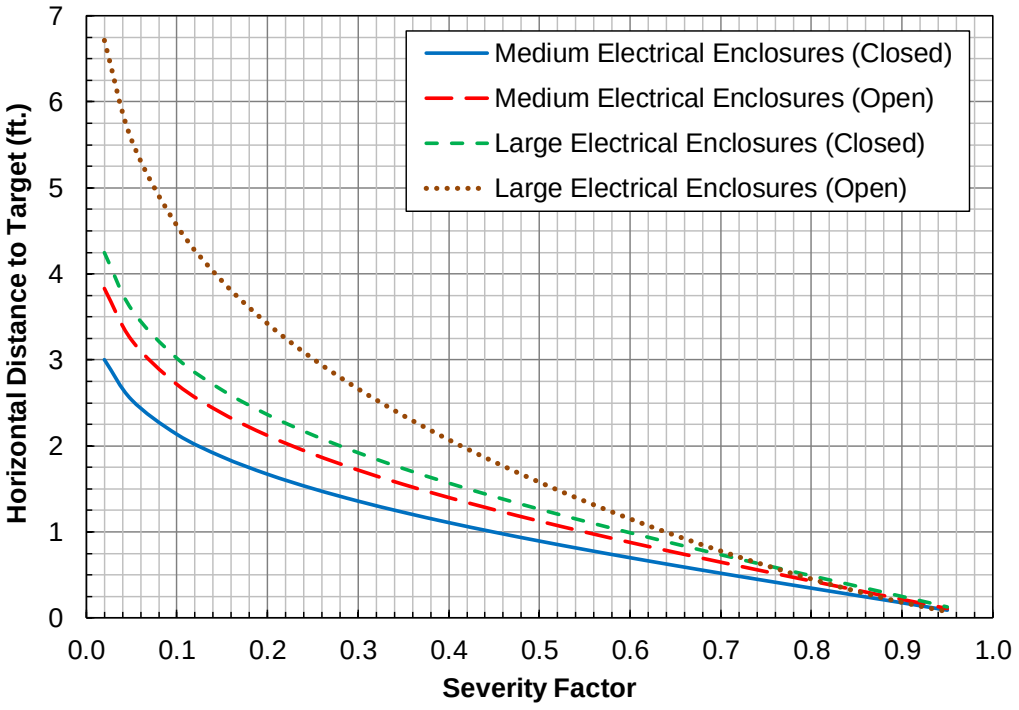

Figure E.08: Severity Factor vs. Radial Target Distance for Electrical Enclosures (Set 2) (TP Cable Targets)

SF	Distance from ignition source to target (ft.)			
	Medium Electrical Enclosures (Closed)	Medium Electical Enclosures (Open)	Large Electrical Enclosures (Closed)	Large Electrical Enclosures (Open)
0.02	4.28	5.46	6.06	9.58
0.05	3.62	4.61	5.12	7.93
0.10	3.05	3.87	4.31	6.51
0.15	2.67	3.39	3.78	5.59
0.20	2.38	3.03	3.37	4.88
0.25	2.15	2.72	3.03	4.30
0.30	1.94	2.45	2.74	3.80
0.35	1.75	2.21	2.48	3.36
0.40	1.58	2.00	2.24	2.96
0.45	1.42	1.80	2.01	2.59
0.50	1.28	1.61	1.80	2.25
0.55	1.13	1.43	1.60	1.94
0.60	1.00	1.25	1.41	1.64
0.65	0.87	1.09	1.23	1.37
0.70	0.74	0.93	1.05	1.11
0.75	0.62	0.77	0.87	0.87
0.80	0.49	0.61	0.70	0.65
0.85	0.37	0.46	0.53	0.44
0.90	0.25	0.31	0.36	0.26
0.95	0.13	0.16	0.18	0.10

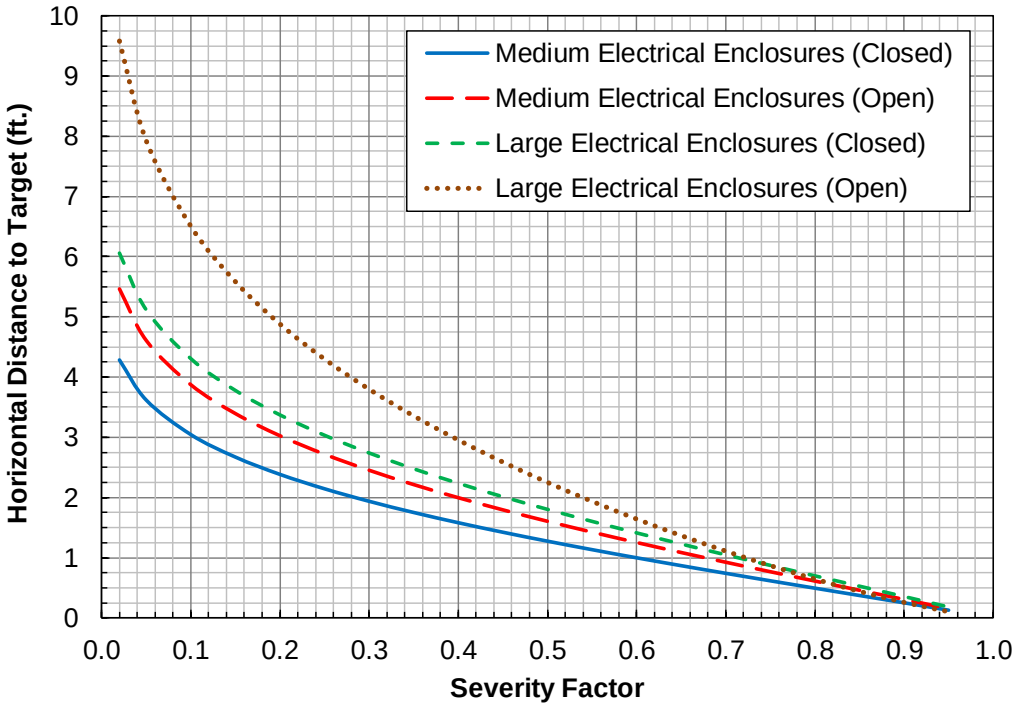

Figure E.09: Severity Factor vs. Radial Target Distance for Electrical Enclosures (Set 2) (SE Targets)

Appendix F. FAILURE TIME VS. VERTICAL DISTANCE TO TARGET ABOVE IGNTION SOURCE

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Set F: Overview and Assumptions

Table/plot set F is used to conservatively estimate the damage time of a target or the ignition time of a secondary combustible located within the vertical ZOI based on its elevation above the ignition source. This time is used in the calculation of the non-suppression probability (Step 2.7.1).

The assumptions and background for the calculations performed to develop the tables and plots in set F are discussed in Section 06.03.06 of IMC 0308, Attachment 3, Appendix F. Since the failure times were obtained as part of the Severity Factor calculations, the assumption were the same as for table/plot set D.

Motors		Pumps		Transients (Contained)		Transients (Loose)	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
4.2	720	6.6	720	7.8	480	7.8	120
3.8	649	5.7	625	7.0	431	7.0	108
3.4	588	4.9	542	6.3	389	6.3	97
3.2	547	4.4	488	5.8	361	5.8	90
3.0	516	4.0	447	5.4	339	5.4	85
2.8	489	3.6	412	5.1	320	5.1	80
2.7	466	3.3	381	4.8	304	4.8	76
2.5	444	3.0	353	4.5	289	4.5	72
2.4	424	2.7	328	4.3	275	4.3	69
2.3	405	2.5	303	4.0	262	4.0	66
2.1	386	2.4	280	3.8	250	3.8	62
2.0	368	2.2	258	3.6	237	3.6	60
1.9	350	2.1	236	3.3	225	3.3	60
1.8	331	1.9	214	3.1	212	3.1	60
1.7	312	1.8	193	3.0	199	3.0	60
1.6	292	1.6	170	2.8	185	2.8	60
1.5	271	1.4	147	2.6	171	2.6	60
1.4	246	1.2	122	2.4	154	2.4	60
1.2	217	1.0	95	2.2	135	2.2	60
1.1	178	0.7	62	1.8	108	1.8	60

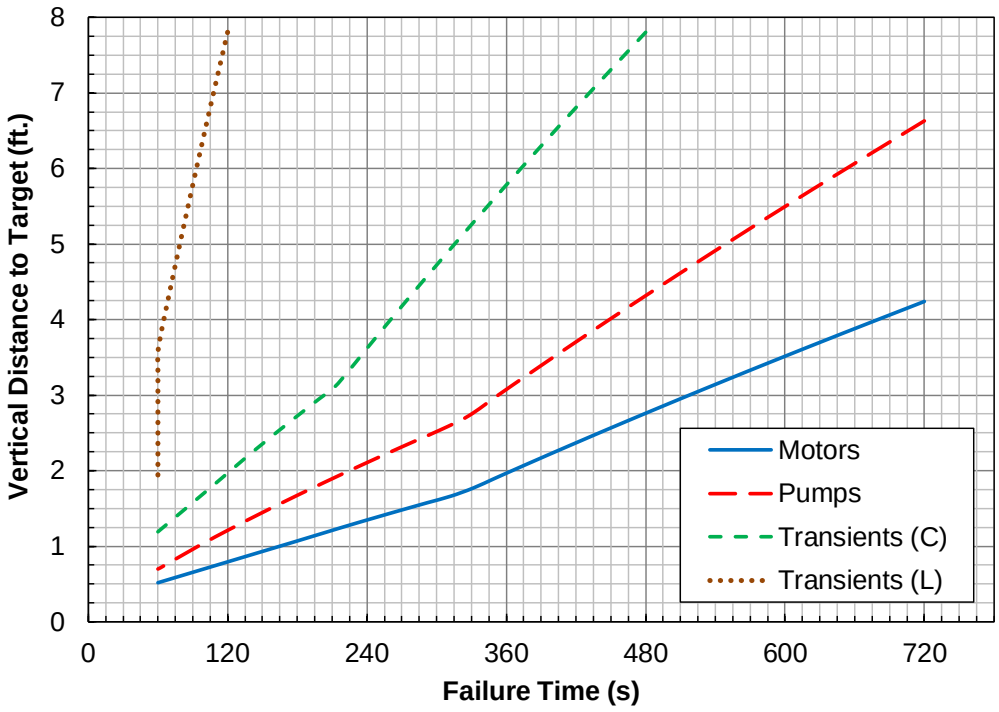

Figure F.01: Failure Time vs. Vertical Target Distance for Motor, Pump and Transient Fires (Free-Burn Configuration, TS Cable Targets)

Motors		Pumps		Transients (Contained)		Transients (Loose)	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
7.1	720	11.1	720	13.1	480	13.1	120
6.4	649	9.5	625	11.6	431	11.6	108
5.7	588	8.1	542	10.4	389	10.4	97
5.3	547	7.2	488	9.6	361	9.6	90
4.9	516	6.5	447	8.9	339	8.9	85
4.6	489	5.9	412	8.3	320	8.3	80
4.4	466	5.3	381	7.8	304	7.8	76
4.1	444	4.8	353	7.4	289	7.4	72
3.9	424	4.3	328	6.9	275	6.9	69
3.7	405	4.0	303	6.5	262	6.5	66
3.4	386	3.8	280	6.1	250	6.1	62
3.2	368	3.5	258	5.7	237	5.7	60
3.0	350	3.3	236	5.3	225	5.3	60
2.8	331	3.0	214	4.9	212	4.9	60
2.6	312	2.8	193	4.6	199	4.6	60
2.5	292	2.5	170	4.4	185	4.4	60
2.3	271	2.2	147	4.1	171	4.1	60
2.2	246	1.9	122	3.8	154	3.8	60
2.0	217	1.6	95	3.4	135	3.4	60
1.7	178	1.1	62	2.9	108	2.9	60

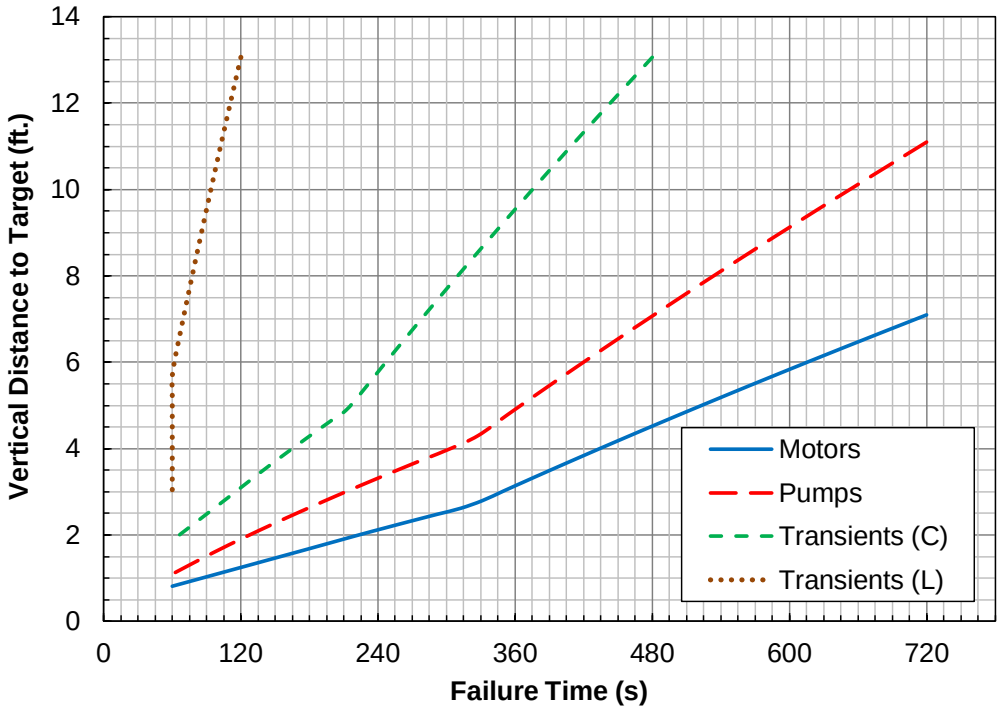

Figure F.02: Failure Time vs. Vertical Target Distance for Motor, Pump and Transient Fires (Corner Configuration, TS Cable Targets)

Motors		Pumps		Transients (Contained)		Transients (Loose)	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
5.7	720	8.9	720	10.5	480	10.5	120
5.1	649	7.7	625	9.4	431	9.4	108
4.7	588	6.7	542	8.5	389	8.5	97
4.3	547	6.1	488	7.9	361	7.9	90
4.1	516	5.5	447	7.4	339	7.4	85
3.9	489	5.1	412	7.0	320	7.0	80
3.7	466	4.7	381	6.6	304	6.6	76
3.5	444	4.3	353	6.3	289	6.3	72
3.3	424	3.9	328	6.0	275	6.0	69
3.2	405	3.7	303	5.7	262	5.7	66
3.0	386	3.4	280	5.4	250	5.4	62
2.9	368	3.2	258	5.1	237	5.1	60
2.7	350	3.0	236	4.8	225	4.8	60
2.5	331	2.8	214	4.5	212	4.5	60
2.4	312	2.6	193	4.3	199	4.3	60
2.3	292	2.3	170	4.0	185	4.0	60
2.1	271	2.1	147	3.8	171	3.8	60
2.0	246	1.8	122	3.5	154	3.5	60
1.8	217	1.5	95	3.1	135	3.1	60
1.5	178	1.0	62	2.6	108	2.6	60

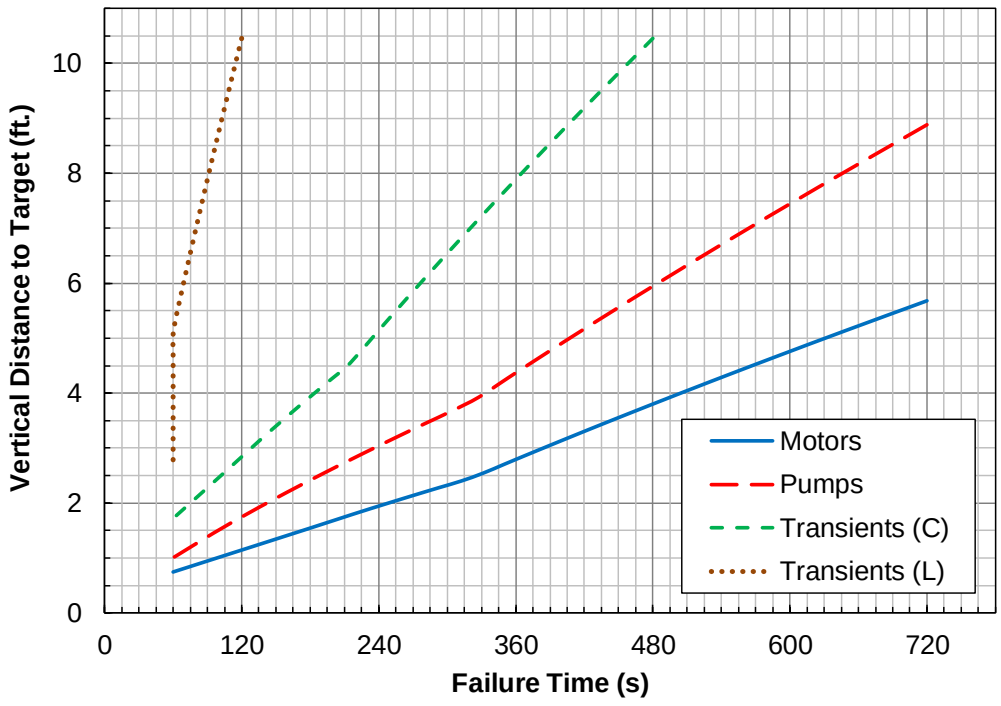

Figure F.03: Failure Time vs. Vertical Target Distance for Motor, Pump and Transient Fires (Free-Burn Configuration, TP Cable Targets)

Motors		Pumps		Transients (Contained)		Transients (Loose)	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
9.6	720	15.0	720	17.7	480	17.7	120
8.7	649	13.0	625	15.9	431	15.9	108
7.8	588	11.3	542	14.3	389	14.3	97
7.3	547	10.1	488	13.2	361	13.2	90
6.8	516	9.2	447	12.4	339	12.4	85
6.5	489	8.4	412	11.7	320	11.7	80
6.1	466	7.7	381	11.0	304	11.0	76
5.8	444	7.0	353	10.4	289	10.4	72
5.5	424	6.4	328	9.9	275	9.9	69
5.2	405	6.0	303	9.3	262	9.3	66
5.0	386	5.6	280	8.8	250	8.8	62
4.7	368	5.2	258	8.3	237	8.3	60
4.4	350	4.9	236	7.8	225	7.8	60
4.1	331	4.5	214	7.3	212	7.3	60
3.9	312	4.1	193	6.9	199	6.9	60
3.7	292	3.8	170	6.5	185	6.5	60
3.5	271	3.3	147	6.1	171	6.1	60
3.2	246	2.9	122	5.7	154	5.7	60
2.9	217	2.4	95	5.1	135	5.1	60
2.5	178	1.7	62	4.3	108	4.3	60

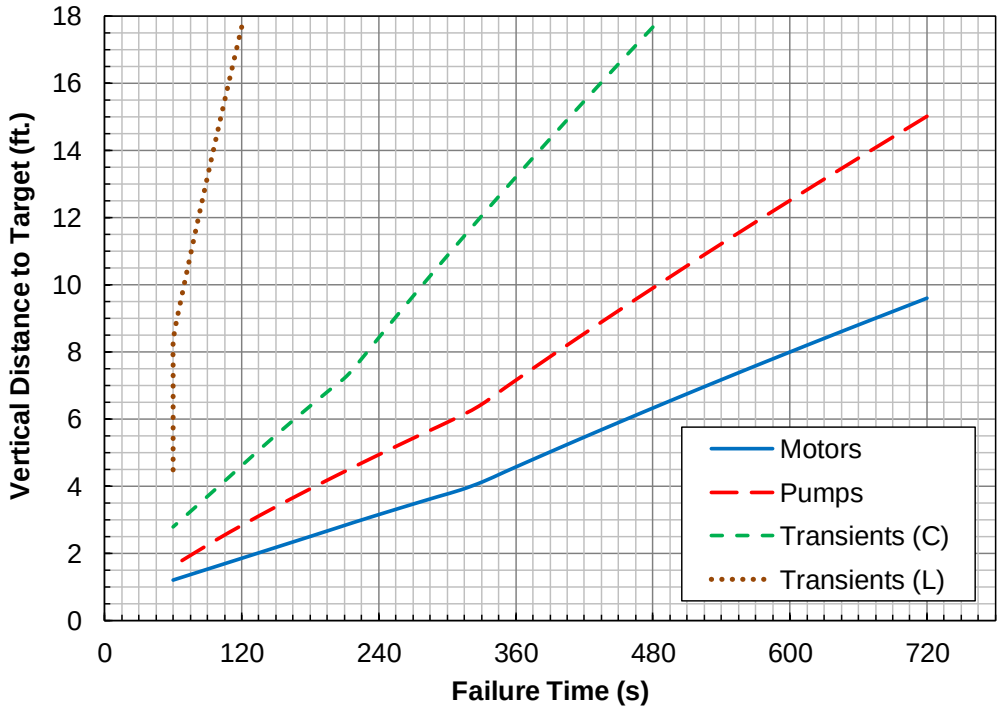

Figure F.04: Failure Time vs. Vertical Target Distance for Motor, Pump and Transient Fires (Corner Configuration, TP Cable Targets)

Small Electrical Enclosures		MCCs & Battery Chargers		Switchgear & Load Centers		Power Inverters	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
2.6	720	4.5	720	5.1	720	5.5	720
2.1	626	3.8	636	4.3	630	4.5	608
1.7	545	3.2	563	3.6	552	3.5	512
1.4	492	2.8	515	3.1	501	2.9	449
1.2	451	2.5	478	2.8	461	2.4	401
1.0	416	2.3	446	2.5	428	2.0	361
0.8	386	2.0	419	2.2	398	1.6	326
0.6	359	1.8	394	1.9	372	1.4	294
0.5	333	1.6	370	1.7	347	1.2	266
0.4	309	1.4	348	1.5	324	1.1	239
0.3	286	1.2	327	1.3	302	0.9	214
0.2	264	1.1	306	1.2	280	0.7	191
0.1	243	1.0	286	1.1	259	0.5	168
0.1	221	0.9	265	0.9	238	0.4	146
		0.8	244	0.8	216	0.2	125
		0.6	222	0.6	194	0.1	104
		0.5	199	0.5	171		
		0.3	174	0.3	145		
		0.2	145	0.1	117		

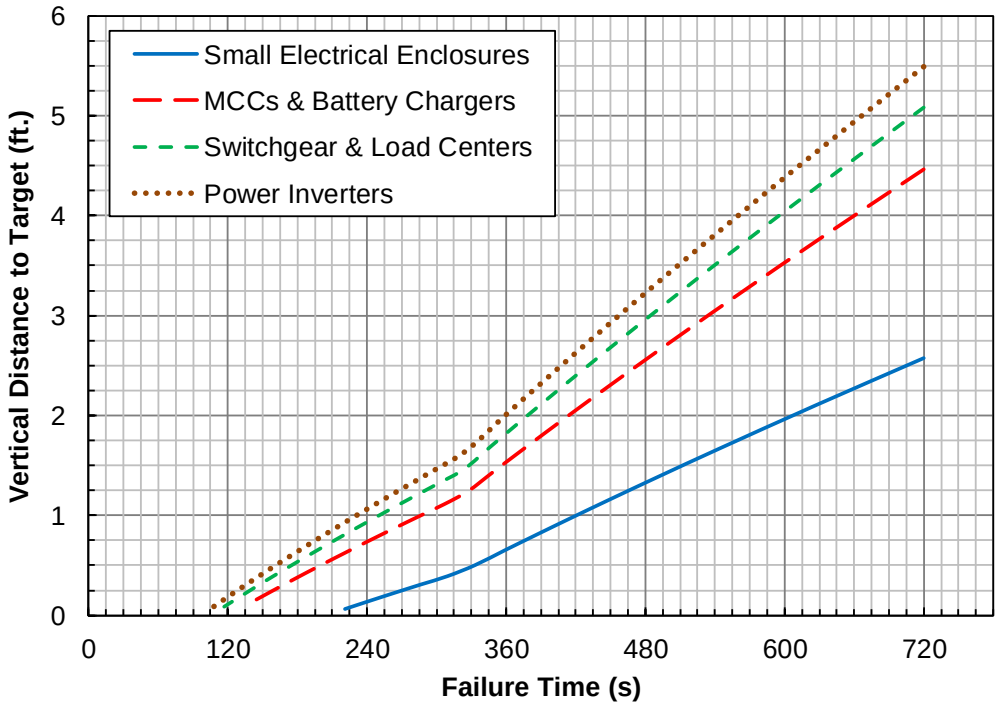

Figure F.05: Failure Time vs. Vertical Target Distance for Electrical Enclosures (Set 1) (Free-Burn Configuration, TS Cable Targets)

Small Electrical Enclosures		MCCs & Battery Chargers		Switchgear & Load Centers		Power Inverters	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
5.0	720	8.1	720	9.2	720	9.9	720
4.2	626	7.0	636	7.8	630	8.1	608
3.4	545	6.0	563	6.6	552	6.5	512
2.9	492	5.3	515	5.8	501	5.4	449
2.5	451	4.8	478	5.2	461	4.5	401
2.2	416	4.3	446	4.6	428	3.8	361
1.9	386	3.9	419	4.1	398	3.2	326
1.6	359	3.6	394	3.7	372	2.8	294
1.4	333	3.2	370	3.3	347	2.5	266
1.2	309	2.9	348	2.9	324	2.2	239
1.1	286	2.5	327	2.7	302	2.0	214
0.9	264	2.3	306	2.4	280	1.7	191
0.8	243	2.1	286	2.2	259	1.4	168
0.7	221	2.0	265	2.0	238	1.2	146
0.5	199	1.8	244	1.8	216	0.9	125
0.4	177	1.6	222	1.6	194	0.7	104
0.3	154	1.4	199	1.3	171	0.4	83
0.1	129	1.1	174	1.0	145	0.1	63
		0.8	145	0.7	117		
		0.4	107	0.3	81		

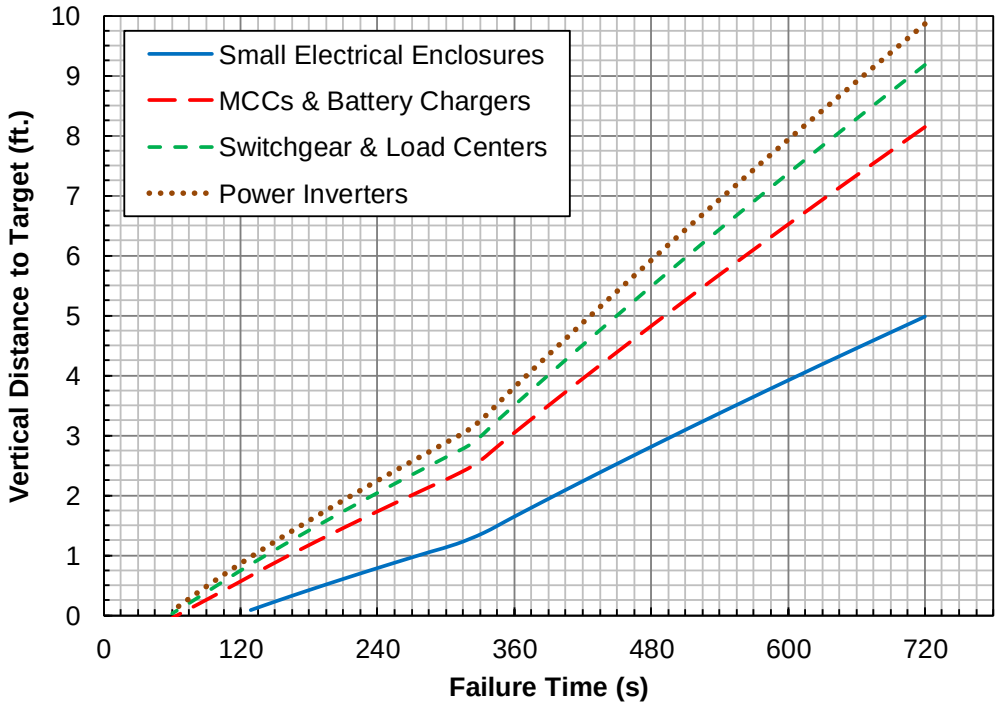

Figure F.06: Failure Time vs. Vertical Target Distance for Electrical Enclosures (Set 1) (Corner Configuration, TS Cable Targets)

Small Electrical Enclosures		MCCs & Battery Chargers		Switchgear & Load Centers		Power Inverters	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
3.8	720	6.3	720	7.1	720	7.7	720
3.2	626	5.5	636	6.2	630	6.4	608
2.6	545	4.8	563	5.3	552	5.2	512
2.3	492	4.3	515	4.7	501	4.4	449
2.0	451	3.9	478	4.2	461	3.8	401
1.8	416	3.5	446	3.8	428	3.3	361
1.5	386	3.2	419	3.5	398	2.8	326
1.3	359	3.0	394	3.2	372	2.5	294
1.2	333	2.7	370	2.8	347	2.2	266
1.0	309	2.5	348	2.6	324	2.0	239
0.9	286	2.2	327	2.4	302	1.7	214
0.8	264	2.0	306	2.2	280	1.5	191
0.7	243	1.9	286	2.0	259	1.2	168
0.5	221	1.7	265	1.8	238	1.0	146
0.4	199	1.5	244	1.6	216	0.8	125
0.3	177	1.4	222	1.4	194	0.5	104
0.1	154	1.2	199	1.1	171	0.3	83
		0.9	174	0.9	145	0.0	63
		0.7	145	0.6	117		
		0.3	107	0.2	81		

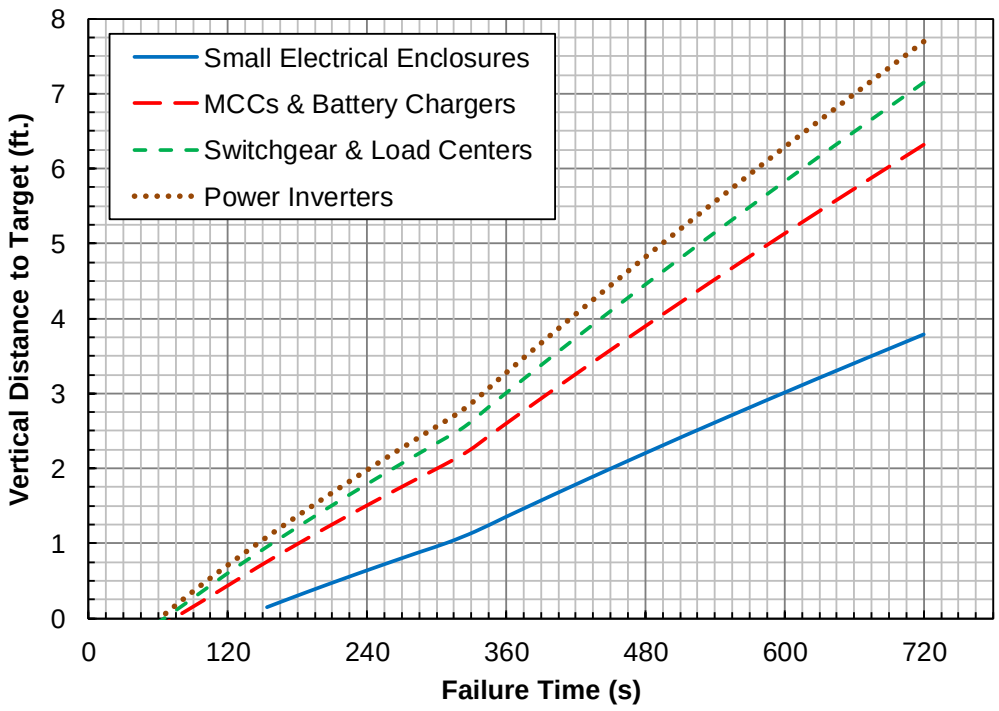

Figure F.07: Failure Time vs. Vertical Target Distance for Electrical Enclosures (Set 1) (Free-Burn Configuration, TP Cable Targets)

Small Electrical Enclosures		MCCs & Battery Chargers		Switchgear & Load Centers		Power Inverters	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
7.1	720	11.4	720	12.8	720	13.7	720
6.0	626	9.9	636	11.1	630	11.4	608
5.1	545	8.7	563	9.5	552	9.4	512
4.5	492	7.8	515	8.5	501	8.0	449
4.0	451	7.1	478	7.7	461	6.9	401
3.6	416	6.5	446	7.0	428	6.0	361
3.2	386	6.0	419	6.4	398	5.2	326
2.8	359	5.5	394	5.8	372	4.7	294
2.5	333	5.1	370	5.3	347	4.3	266
2.3	309	4.7	348	4.8	324	3.8	239
2.1	286	4.3	327	4.4	302	3.4	214
1.9	264	4.0	306	4.1	280	3.0	191
1.7	243	3.7	286	3.8	259	2.6	168
1.5	221	3.4	265	3.5	238	2.3	146
1.3	199	3.1	244	3.2	216	1.9	125
1.1	177	2.8	222	2.8	194	1.5	104
0.9	154	2.5	199	2.5	171	1.1	83
0.6	129	2.1	174	2.0	145	0.7	63
0.3	101	1.7	145	1.5	117	0.2	60
		1.1	107	0.9	81		

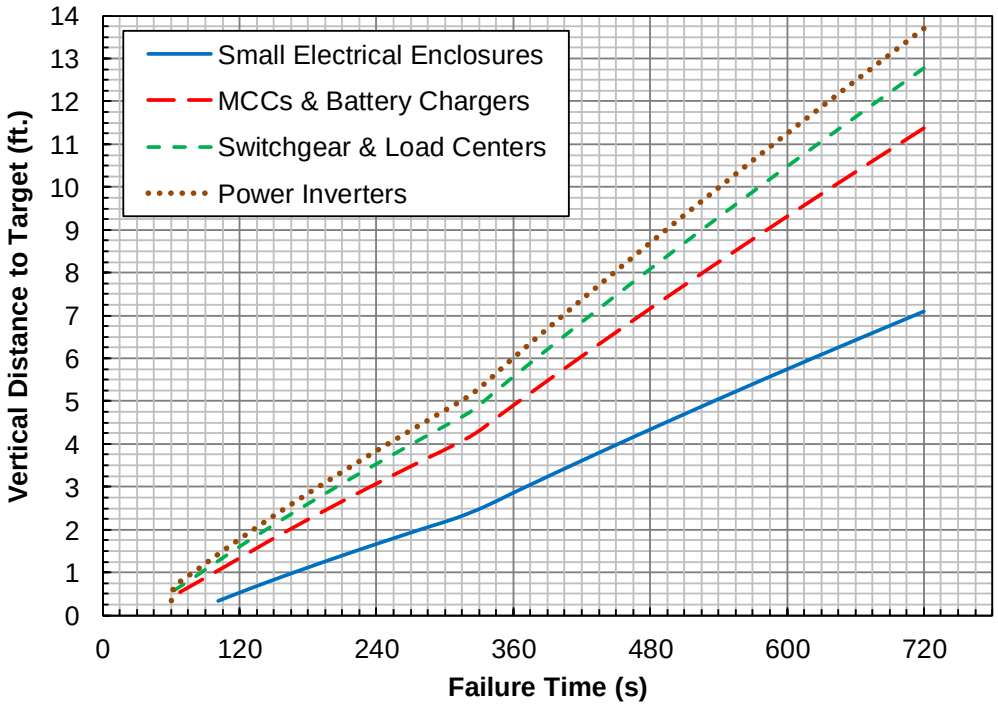

Figure F.08: Failure Time vs. Vertical Target Distance for Electrical Enclosures (Set 1) (Corner Configuration, TP Cable Targets)

Medium Electrical Enclosures (Closed)		Medium Electrical Enclosures (Open)		Large Electrical Enclosures (Closed)		Large Electrical Enclosures (Open)	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
5.5	720	6.9	720	7.6	720	11.4	720
4.5	608	5.6	607	6.2	608	9.2	596
3.5	512	4.5	510	5.0	512	7.2	489
2.9	449	3.7	447	4.2	449	5.9	420
2.4	401	3.1	399	3.5	401	4.9	367
2.0	361	2.6	358	3.0	361	4.0	323
1.6	326	2.2	323	2.5	326	3.5	285
1.4	294	1.9	292	2.2	294	3.1	252
1.2	266	1.7	263	2.0	266	2.7	222
1.1	239	1.5	237	1.7	239	2.3	195
0.9	214	1.3	212	1.5	214	2.0	169
0.7	191	1.1	188	1.3	191	1.6	146
0.5	168	0.9	165	1.0	168	1.3	123
0.4	146	0.7	143	0.8	146	1.0	103
0.2	125	0.5	122	0.6	125	0.7	83
0.1	104	0.3	101	0.4	104	0.4	65
		0.0	81	0.2	83	0.1	60

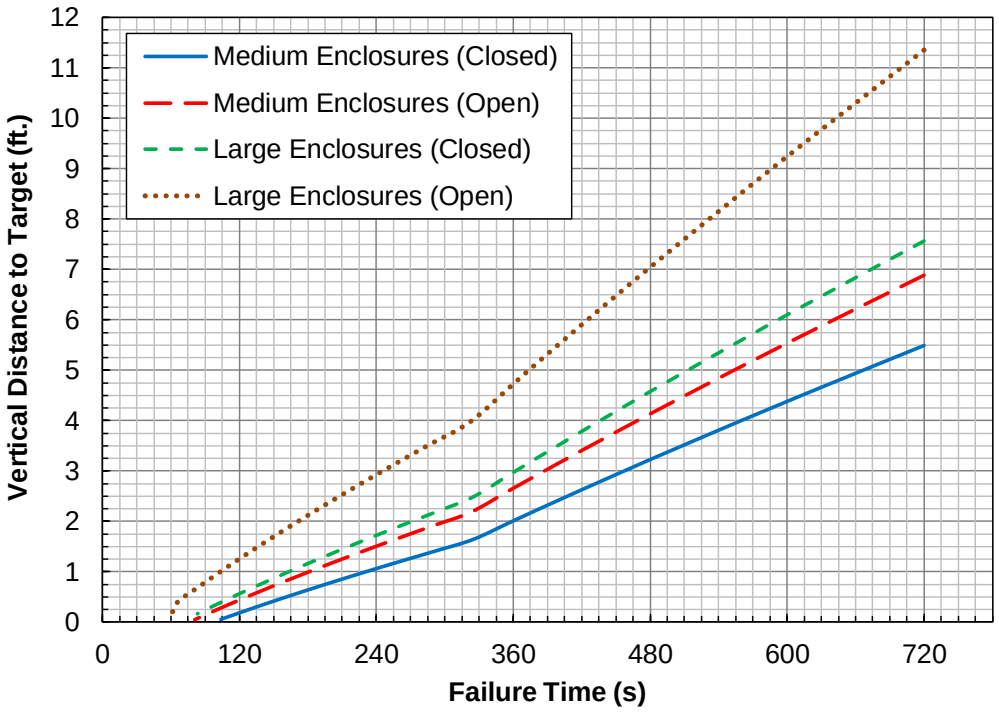

Figure F.09: Failure Time vs. Vertical Target Distance for Electrical Enclosures (Set 2) (Free-Burn Configuration, TS Cable Targets)

Medium Electrical Enclosures (Closed)		Medium Electrical Enclosures (Open)		Large Electrical Enclosures (Closed)		Large Electrical Enclosures (Open)	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
9.9	720	12.2	720	13.3	720	19.7	720
8.1	608	10.0	607	11.0	608	15.9	596
6.5	512	8.0	510	8.8	512	12.5	489
5.4	449	6.7	447	7.4	449	10.2	420
4.5	401	5.7	399	6.3	401	8.4	367
3.8	361	4.8	358	5.4	361	6.9	323
3.2	326	4.0	323	4.5	326	6.1	285
2.8	294	3.6	292	4.0	294	5.4	252
2.5	266	3.2	263	3.6	266	4.8	222
2.2	239	2.9	237	3.3	239	4.2	195
2.0	214	2.6	212	2.9	214	3.7	169
1.7	191	2.2	188	2.6	191	3.1	146
1.4	168	1.9	165	2.2	168	2.6	123
1.2	146	1.6	143	1.9	146	2.1	103
0.9	125	1.3	122	1.5	125	1.7	83
0.7	104	1.0	101	1.2	104	1.2	65
0.4	83	0.7	81	0.8	83	0.7	60
0.1	63	0.3	61	0.5	63	0.3	60
				0.1	60		

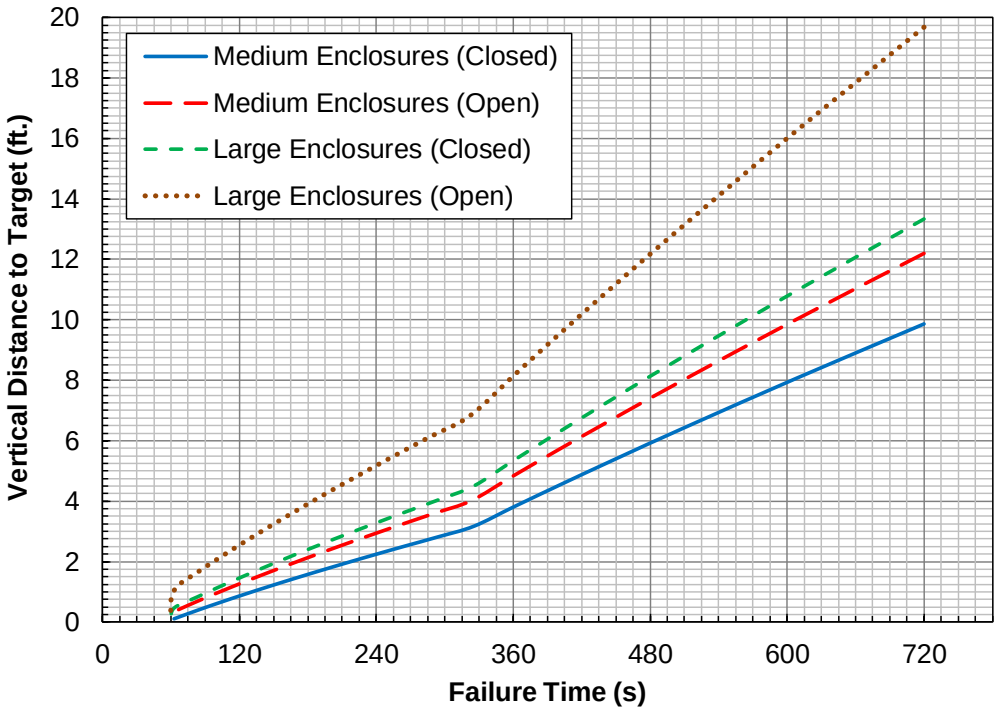

Figure F.10: Failure Time vs. Vertical Target Distance for Electrical Enclosures (Set 2) (Corner Configuration, TS Cable Targets)

Medium Electrical Enclosures (Closed)		Medium Electrical Enclosures (Open)		Large Electrical Enclosures (Closed)		Large Electrical Enclosures (Open)	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
7.7	720	9.6	720	10.5	720	15.6	720
6.4	608	8.0	607	8.7	608	12.8	596
5.2	512	6.5	510	7.2	512	10.3	489
4.4	449	5.6	447	6.2	449	8.6	420
3.8	401	4.8	399	5.3	401	7.3	367
3.3	361	4.2	358	4.7	361	6.2	323
2.8	326	3.6	323	4.0	326	5.5	285
2.5	294	3.2	292	3.6	294	4.9	252
2.2	266	2.9	263	3.3	266	4.3	222
2.0	239	2.6	237	2.9	239	3.8	195
1.7	214	2.3	212	2.6	214	3.3	169
1.5	191	2.0	188	2.3	191	2.8	146
1.2	168	1.7	165	2.0	168	2.3	123
1.0	146	1.4	143	1.6	146	1.9	103
0.8	125	1.1	122	1.3	125	1.4	83
0.5	104	0.8	101	1.0	104	1.0	65
0.3	83	0.5	81	0.7	83	0.6	60
0.0	63	0.2	61	0.3	63	0.2	60

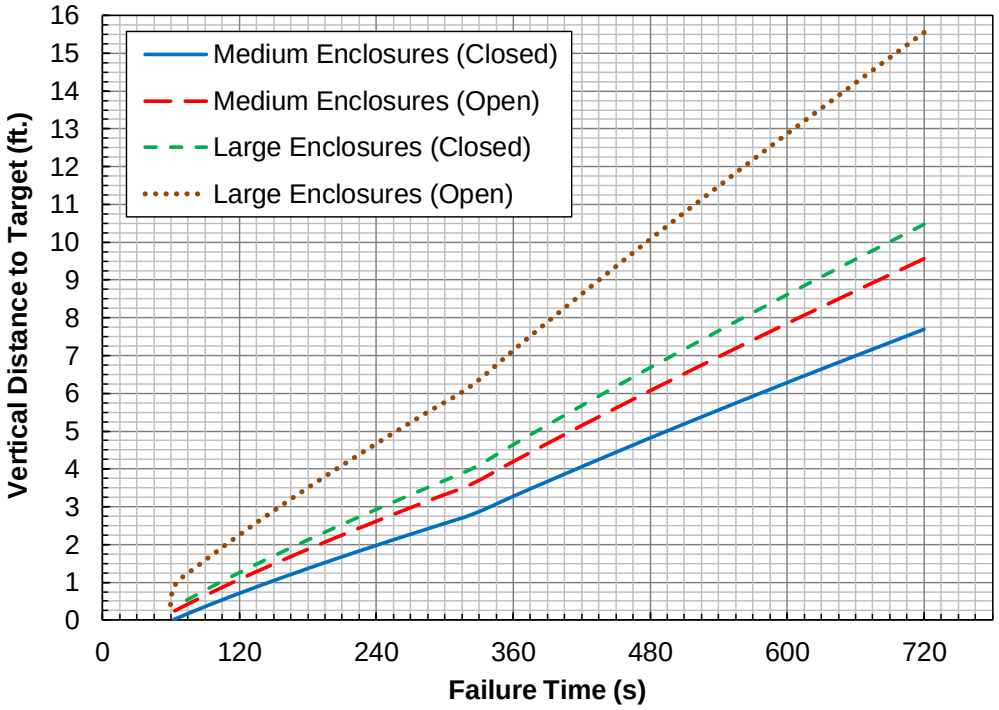

Figure F.11: Failure Time vs. Vertical Target Distance for Electrical Enclosures (Set 2) (Free-Burn Configuration, TP Cable Targets)

Medium Electrical Enclosures (Closed)		Medium Electrical Enclosures (Open)		Large Electrical Enclosures (Closed)		Large Electrical Enclosures (Open)	
z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)	z_{target} (ft.)	t_{fail} (s)
13.7	720	16.9	720	18.4	720	27.0	720
11.4	608	14.1	607	15.4	608	22.1	596
9.4	512	11.6	510	12.7	512	17.8	489
8.0	449	9.9	447	10.9	449	14.9	420
6.9	401	8.6	399	9.5	401	12.6	367
6.0	361	7.5	358	8.3	361	10.7	323
5.2	326	6.5	323	7.2	326	9.6	285
4.7	294	5.9	292	6.5	294	8.6	252
4.3	266	5.3	263	5.9	266	7.7	222
3.8	239	4.8	237	5.4	239	6.8	195
3.4	214	4.3	212	4.8	214	6.0	169
3.0	191	3.8	188	4.3	191	5.2	146
2.6	168	3.4	165	3.8	168	4.4	123
2.3	146	2.9	143	3.3	146	3.7	103
1.9	125	2.4	122	2.8	125	3.0	83
1.5	104	1.9	101	2.3	104	2.3	65
1.1	83	1.5	81	1.7	83	1.6	60
0.7	63	1.0	61	1.2	63	0.9	60
0.2	60	0.4	60	0.6	60	0.2	60

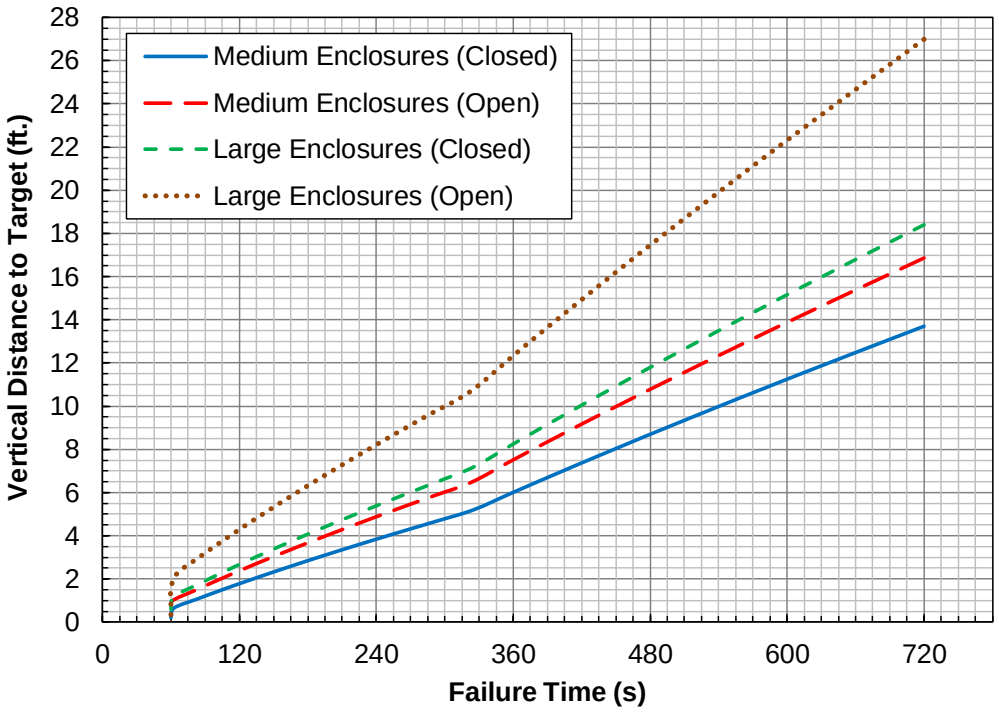

Figure F.12: Failure Time vs. Vertical Target Distance for Electrical Enclosures (Set 2) (Corner Configuration, TP Cable Targets)

Appendix G. FAILURE TIME VS. RADIAL DISTANCE FROM IGNTION SOURCE TO TARGET

TABLE OF CONTENTS

Set G: Overview and Assumptions

Table/plot set G is used to conservatively estimate the damage time of a target or the ignition time of a secondary combustible located within the radial ZOI based on its radial distance from the ignition source. This time is used in the calculation of the non-suppression probability (Step 2.7.1).

The assumptions and background for the calculations performed to develop the tables and plots in set G are discussed in Section 06.03.07 of IMC 0308, Attachment 3, Appendix F. Since the failure times were obtained as part of the Severity Factor calculations, the assumption were the same as for table/plot set E.

Motors		Pumps		Transients (Contained)		Transients (Loose)	
R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)
1.25	720	2.18	720	2.67	480	2.67	120
1.12	649	1.89	625	2.40	431	2.40	108
1.02	588	1.64	542	2.16	389	2.16	97
0.95	547	1.48	488	2.01	361	2.01	90
0.89	516	1.35	447	1.89	339	1.89	85
0.85	489	1.25	412	1.78	320	1.78	80
0.81	466	1.15	381	1.69	304	1.69	76
0.77	444	1.07	353	1.61	289	1.61	72
0.73	424	0.99	328	1.53	275	1.53	69
0.70	405	0.92	303	1.46	262	1.46	66
0.67	386	0.85	280	1.39	250	1.39	62
0.64	368	0.78	258	1.32	237	1.32	60
0.61	350	0.72	236	1.25	225	1.25	60
0.57	331	0.65	214	1.18	212	1.18	60
0.54	312	0.58	193	1.11	199	1.11	60
0.51	292	0.52	170	1.03	185	1.03	60
0.47	271	0.45	147	0.95	171	0.95	60
0.43	246	0.37	122	0.86	154	0.86	60
0.38	217	0.29	95	0.75	135	0.75	60
0.31	178	0.19	62	0.60	108	0.60	60

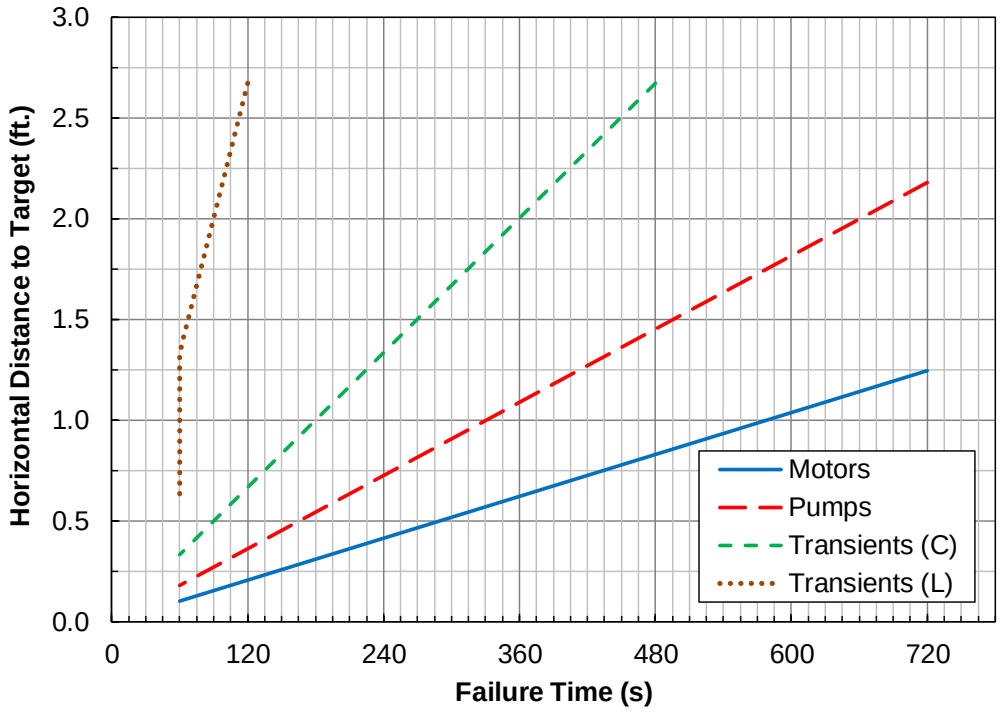

Figure G.01: Failure Time vs. Radial Target Distance for Motor, Pump and Transient Fires (TS Cable Targets)

Motors		Pumps		Transients (Contained)		Transients (Loose)	
R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)
1.76	720	3.08	720	3.78	480	3.78	120
1.59	649	2.68	625	3.39	431	3.39	108
1.44	588	2.32	542	3.06	389	3.06	97
1.34	547	2.09	488	2.84	361	2.84	90
1.26	516	1.91	447	2.67	339	2.67	85
1.20	489	1.76	412	2.52	320	2.52	80
1.14	466	1.63	381	2.40	304	2.40	76
1.09	444	1.51	353	2.28	289	2.28	72
1.04	424	1.40	328	2.17	275	2.17	69
0.99	405	1.30	303	2.07	262	2.07	66
0.95	386	1.20	280	1.97	250	1.97	62
0.90	368	1.11	258	1.87	237	1.87	60
0.86	350	1.01	236	1.77	225	1.77	60
0.81	331	0.92	214	1.67	212	1.67	60
0.76	312	0.82	193	1.57	199	1.57	60
0.72	292	0.73	170	1.46	185	1.46	60
0.66	271	0.63	147	1.34	171	1.34	60
0.60	246	0.52	122	1.21	154	1.21	60
0.53	217	0.41	95	1.06	135	1.06	60
0.44	178	0.27	62	0.85	108	0.85	60

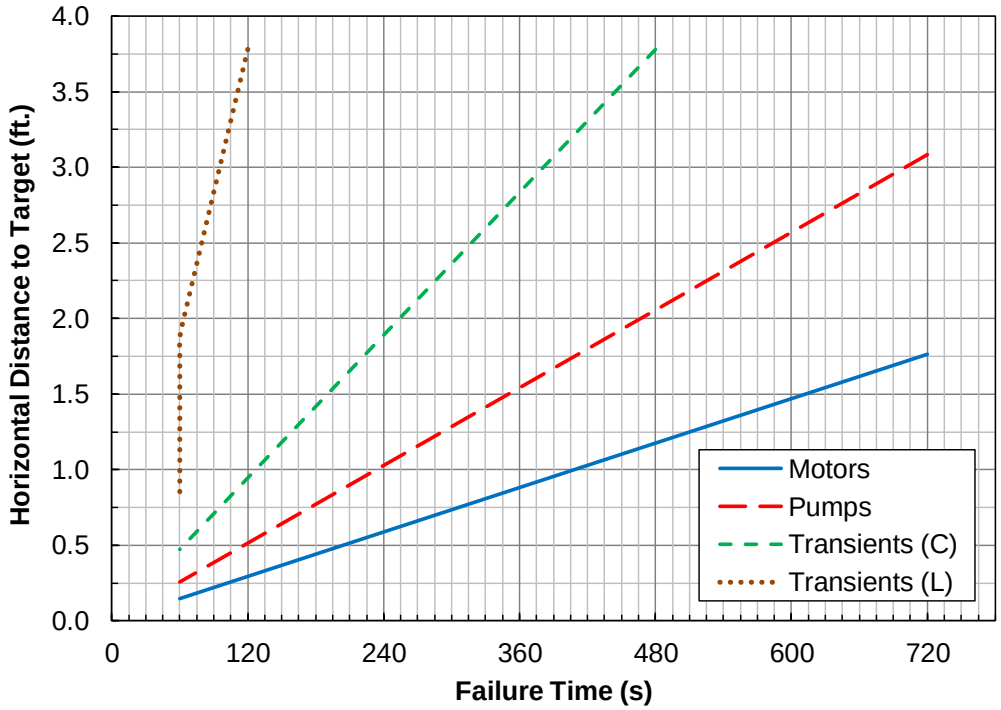

Figure G.02: Failure Time vs. Radial Target Distance for Motor, Pump and Transient Fires (TP Cable Targets)

Motors		Pumps		Transients (Contained)		Transients (Loose)	
R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)
2.52	720	4.40	720	5.39	480	5.39	120
2.27	649	3.82	625	4.84	431	4.84	108
2.05	588	3.31	542	4.37	389	4.37	97
1.91	547	2.99	488	4.05	361	4.05	90
1.80	516	2.73	447	3.81	339	3.81	85
1.71	489	2.52	412	3.60	320	3.60	80
1.63	466	2.33	381	3.42	304	3.42	76
1.55	444	2.16	353	3.25	289	3.25	72
1.48	424	2.00	328	3.10	275	3.10	69
1.41	405	1.85	303	2.95	262	2.95	66
1.35	386	1.71	280	2.80	250	2.80	62
1.29	368	1.58	258	2.66	237	2.66	60
1.22	350	1.44	236	2.52	225	2.52	60
1.16	331	1.31	214	2.38	212	2.38	60
1.09	312	1.18	193	2.24	199	2.24	60
1.02	292	1.04	170	2.08	185	2.08	60
0.95	271	0.90	147	1.92	171	1.92	60
0.86	246	0.75	122	1.73	154	1.73	60
0.76	217	0.58	95	1.51	135	1.51	60
0.62	178	0.38	62	1.22	108	1.22	60

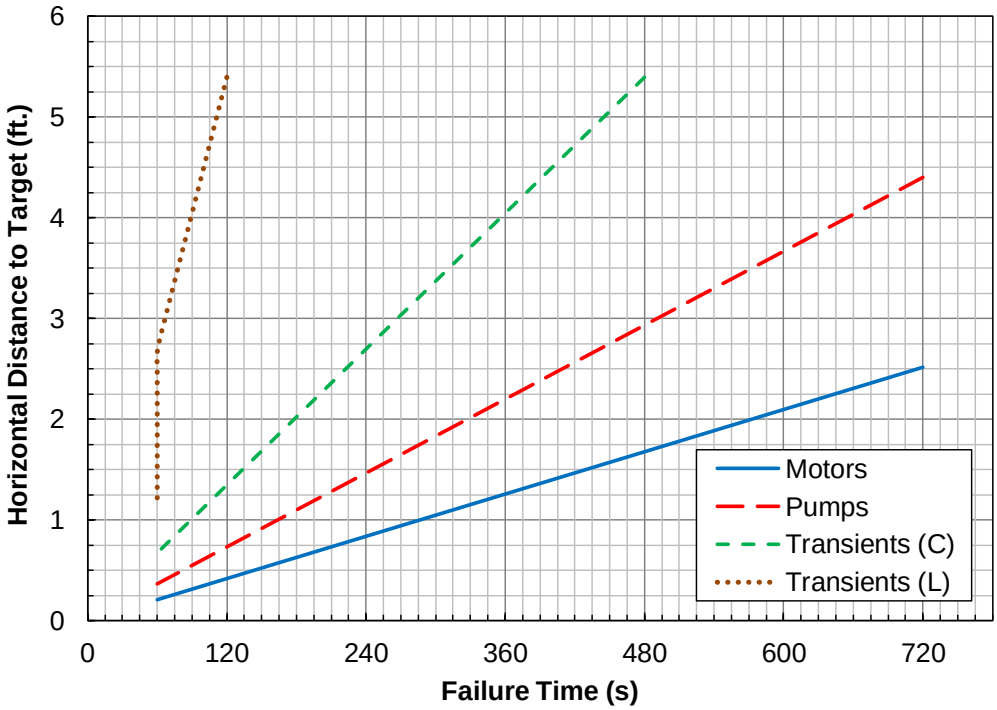

Figure G.03: Failure Time vs. Radial Target Distance for Motor, Pump and Transient Fires (SE Targets)

Small Electrical Enclosures		MCCs & Battery Chargers		Switchgear & Load Centers		Power Inverters	
R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)
1.01	720	1.71	720	1.96	720	2.12	720
0.88	626	1.51	636	1.71	630	1.79	608
0.76	545	1.34	563	1.50	552	1.51	512
0.69	492	1.22	515	1.36	501	1.32	449
0.63	451	1.14	478	1.25	461	1.18	401
0.58	416	1.06	446	1.16	428	1.06	361
0.54	386	1.00	419	1.08	398	0.96	326
0.50	359	0.94	394	1.01	372	0.87	294
0.47	333	0.88	370	0.94	347	0.78	266
0.43	309	0.83	348	0.88	324	0.71	239
0.40	286	0.78	327	0.82	302	0.63	214
0.37	264	0.73	306	0.76	280	0.56	191
0.34	243	0.68	286	0.70	259	0.50	168
0.31	221	0.63	265	0.65	238	0.43	146
0.28	199	0.58	244	0.59	216	0.37	125
0.25	177	0.53	222	0.53	194	0.31	104
0.22	154	0.47	199	0.46	171	0.25	83
0.18	129	0.41	174	0.40	145	0.18	63
0.14	101	0.34	145	0.32	117	0.12	60
0.09	68	0.25	107	0.22	81	0.06	60

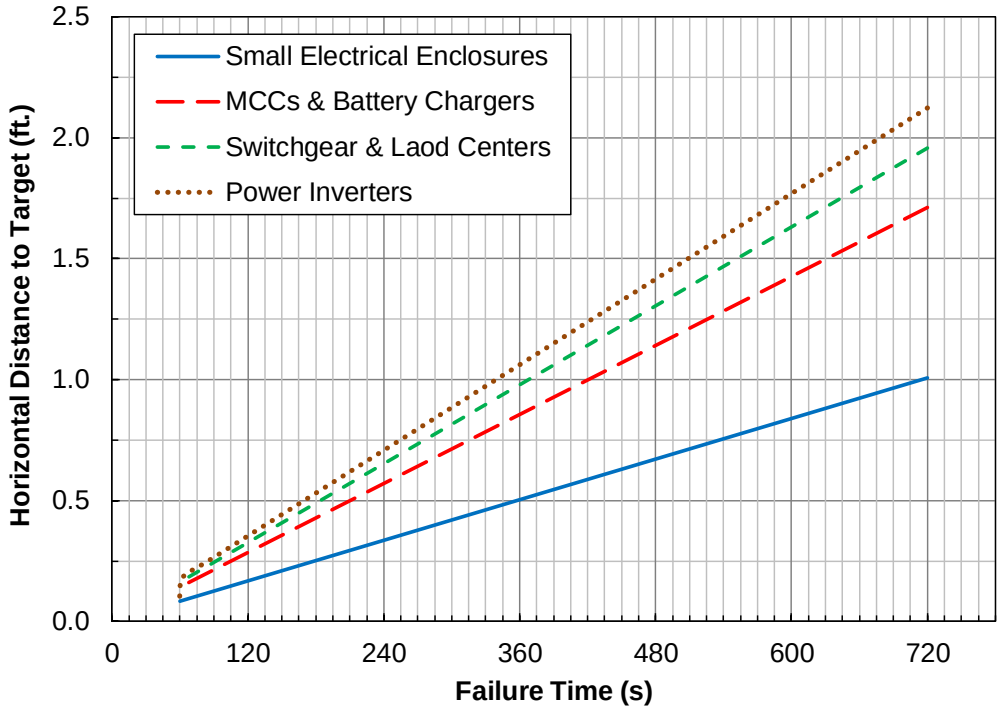

Figure G.04: Failure Time vs. Radial Target Distance for Electrical Enclosures (Set 1) (TS Cable Targets)

Small Electrical Enclosures		MCCs & Battery Chargers		Switchgear & Load Centers		Power Inverters	
R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)
1.42	720	2.42	720	2.77	720	3.00	720
1.24	626	2.14	636	2.42	630	2.54	608
1.08	545	1.89	563	2.12	552	2.13	512
0.97	492	1.73	515	1.93	501	1.87	449
0.89	451	1.61	478	1.77	461	1.67	401
0.82	416	1.50	446	1.64	428	1.50	361
0.76	386	1.41	419	1.53	398	1.36	326
0.71	359	1.32	394	1.43	372	1.23	294
0.66	333	1.25	370	1.34	347	1.11	266
0.61	309	1.17	348	1.25	324	1.00	239
0.57	286	1.10	327	1.16	302	0.89	214
0.52	264	1.03	306	1.08	280	0.80	191
0.48	243	0.96	286	1.00	259	0.70	168
0.44	221	0.89	265	0.91	238	0.61	146
0.39	199	0.82	244	0.83	216	0.52	125
0.35	177	0.75	222	0.75	194	0.43	104
0.30	154	0.67	199	0.66	171	0.35	83
0.25	129	0.59	174	0.56	145	0.26	63
0.20	101	0.49	145	0.45	117	0.18	60
0.13	68	0.36	107	0.31	81	0.09	60

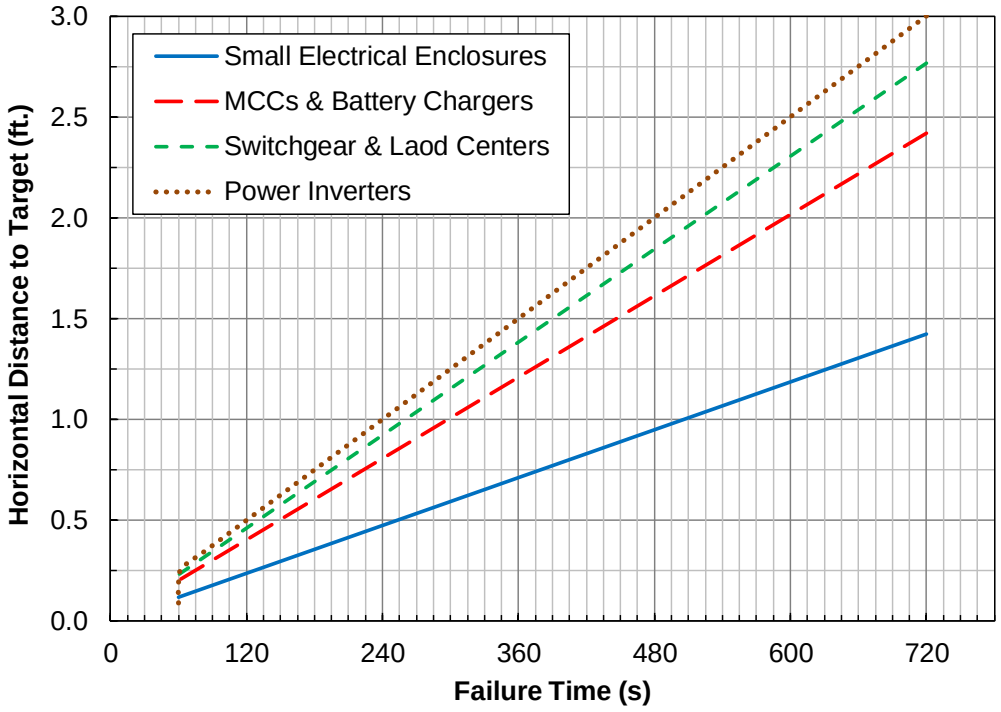

Figure G.05: Failure Time vs. Radial Target Distance for Electrical Enclosures (Set 1) (TP Cable Targets)

Small Electrical Enclosures		MCCs & Battery Chargers		Switchgear & Load Centers		Power Inverters	
R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)
2.03	720	3.45	720	3.95	720	4.28	720
1.77	626	3.05	636	3.45	630	3.62	608
1.54	545	2.70	563	3.03	552	3.05	512
1.39	492	2.47	515	2.75	501	2.67	449
1.27	451	2.29	478	2.53	461	2.38	401
1.17	416	2.14	446	2.35	428	2.15	361
1.09	386	2.01	419	2.19	398	1.94	326
1.01	359	1.89	394	2.04	372	1.75	294
0.94	333	1.78	370	1.91	347	1.58	266
0.87	309	1.67	348	1.78	324	1.42	239
0.81	286	1.57	327	1.66	302	1.28	214
0.75	264	1.47	306	1.54	280	1.13	191
0.68	243	1.37	286	1.42	259	1.00	168
0.62	221	1.27	265	1.30	238	0.87	146
0.56	199	1.17	244	1.18	216	0.74	125
0.50	177	1.07	222	1.06	194	0.62	104
0.43	154	0.96	199	0.94	171	0.49	83
0.36	129	0.83	174	0.80	145	0.37	63
0.29	101	0.69	145	0.64	117	0.25	60
0.19	68	0.51	107	0.45	81	0.13	60

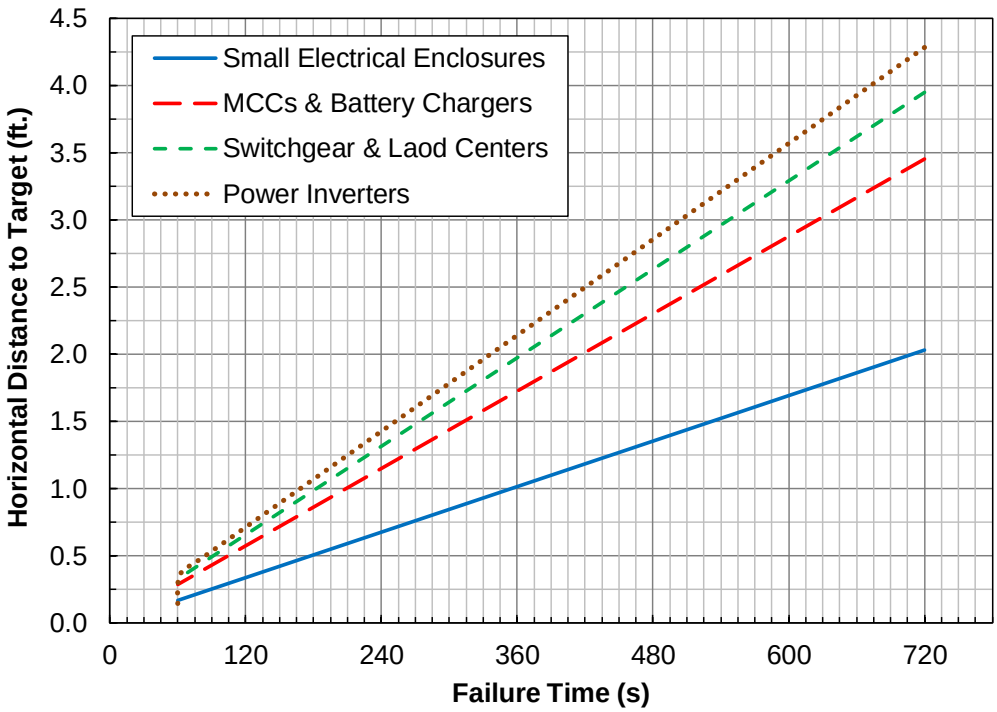

Figure G.06: Failure Time vs. Radial Target Distance for Electrical Enclosures (Set 1) (SE Targets)

Medium Electrical Enclosures (Closed)		Medium Electrical Enclosures (Open)		Large Electrical Enclosures (Closed)		Large Electrical Enclosures (Open)	
R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)
2.12	720	2.71	720	3.00	720	4.75	720
1.79	608	2.28	607	2.54	608	3.93	596
1.51	512	1.92	510	2.13	512	3.22	489
1.32	449	1.68	447	1.87	449	2.77	420
1.18	401	1.50	399	1.67	401	2.42	367
1.06	361	1.35	358	1.50	361	2.13	323
0.96	326	1.22	323	1.36	326	1.88	285
0.87	294	1.10	292	1.23	294	1.66	252
0.78	266	0.99	263	1.11	266	1.46	222
0.71	239	0.89	237	1.00	239	1.28	195
0.63	214	0.80	212	0.89	214	1.12	169
0.56	191	0.71	188	0.80	191	0.96	146
0.50	168	0.62	165	0.70	168	0.81	123
0.43	146	0.54	143	0.61	146	0.68	103
0.37	125	0.46	122	0.52	125	0.55	83
0.31	104	0.38	101	0.43	104	0.43	65
0.25	83	0.30	81	0.35	83	0.32	60
0.18	63	0.23	61	0.26	63	0.22	60
0.12	60	0.15	60	0.18	60	0.13	60
0.06	60	0.08	60	0.09	60	0.05	60

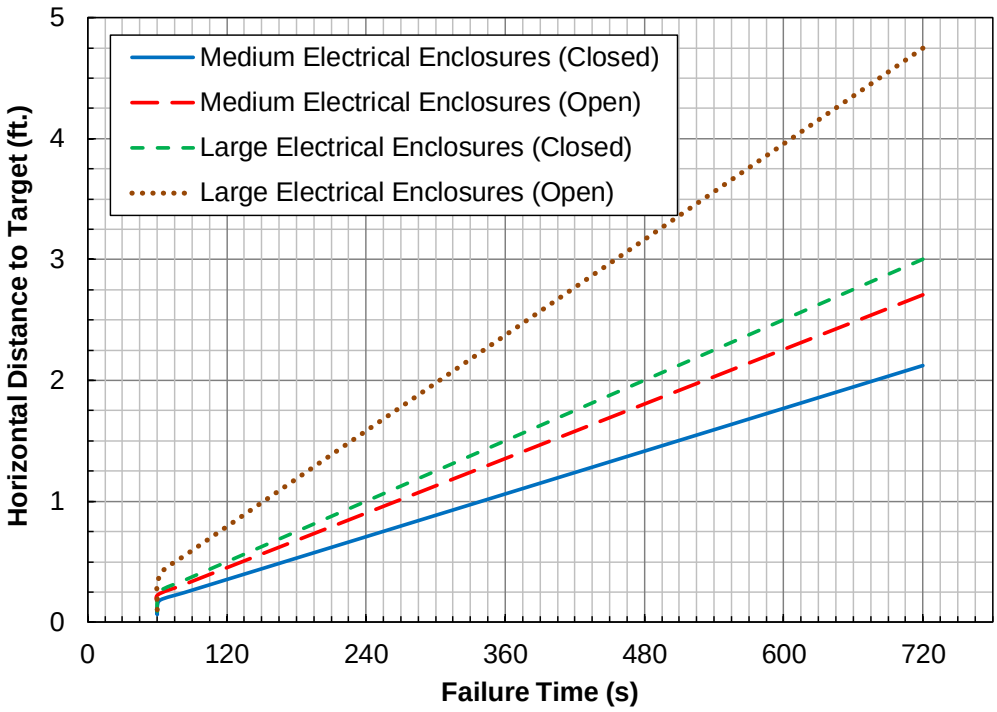

Figure G.07: Failure Time vs. Radial Target Distance for Electrical Enclosures (Set 2) (TS Cable Targets)

Medium Electrical Enclosures (Closed)		Medium Electrical Enclosures (Open)		Large Electrical Enclosures (Closed)		Large Electrical Enclosures (Open)	
R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)
3.00	720	3.83	720	4.25	720	6.71	720
2.54	608	3.23	607	3.59	608	5.56	596
2.13	512	2.72	510	3.02	512	4.56	489
1.87	449	2.38	447	2.65	449	3.91	420
1.67	401	2.12	399	2.36	401	3.42	367
1.50	361	1.91	358	2.13	361	3.01	323
1.36	326	1.72	323	1.92	326	2.66	285
1.23	294	1.55	292	1.74	294	2.35	252
1.11	266	1.40	263	1.57	266	2.07	222
1.00	239	1.26	237	1.41	239	1.81	195
0.89	214	1.13	212	1.26	214	1.58	169
0.80	191	1.00	188	1.12	191	1.36	146
0.70	168	0.88	165	0.99	168	1.15	123
0.61	146	0.76	143	0.86	146	0.96	103
0.52	125	0.65	122	0.74	125	0.78	83
0.43	104	0.54	101	0.61	104	0.61	65
0.35	83	0.43	81	0.49	83	0.45	60
0.26	63	0.32	61	0.37	63	0.31	60
0.18	60	0.22	60	0.25	60	0.18	60
0.09	60	0.11	60	0.13	60	0.07	60

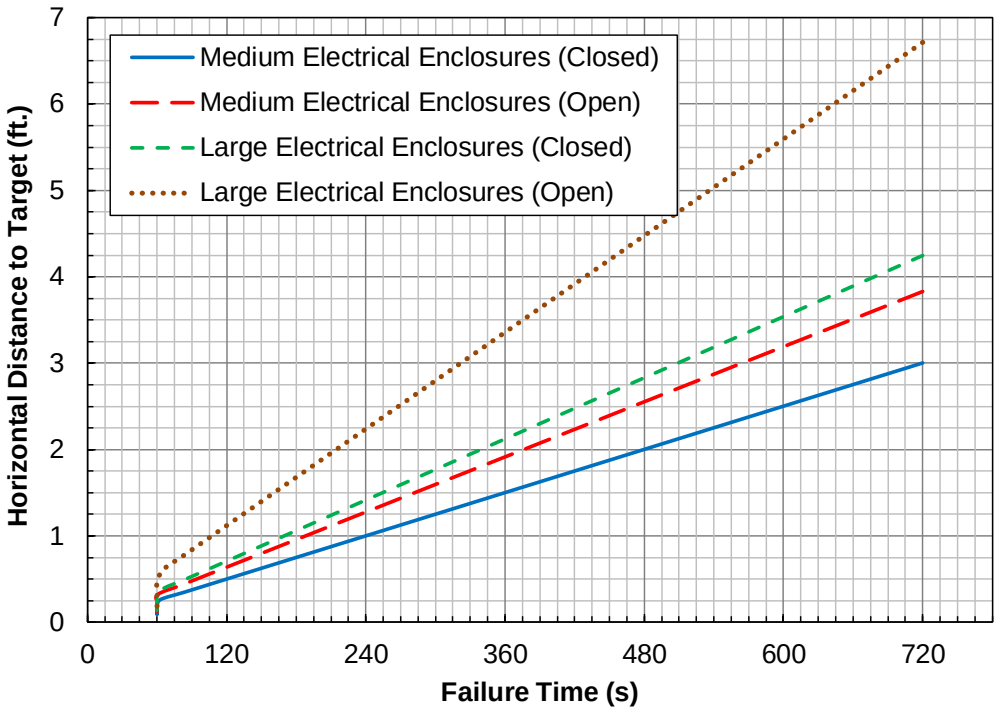

Figure G.08: Failure Time vs. Radial Target Distance for Electrical Enclosures (Set 2) (TP Cable Targets)

Medium Electrical Enclosures (Closed)		Medium Electrical Enclosures (Open)		Large Electrical Enclosures (Closed)		Large Electrical Enclosures (Open)	
R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)	R_{target} (ft.)	t_{fail} (s)
4.28	720	5.46	720	6.06	720	9.58	720
3.62	608	4.61	607	5.12	608	7.93	596
3.05	512	3.87	510	4.31	512	6.51	489
2.67	449	3.39	447	3.78	449	5.59	420
2.38	401	3.03	399	3.37	401	4.88	367
2.15	361	2.72	358	3.03	361	4.30	323
1.94	326	2.45	323	2.74	326	3.80	285
1.75	294	2.21	292	2.48	294	3.36	252
1.58	266	2.00	263	2.24	266	2.96	222
1.42	239	1.80	237	2.01	239	2.59	195
1.28	214	1.61	212	1.80	214	2.25	169
1.13	191	1.43	188	1.60	191	1.94	146
1.00	168	1.25	165	1.41	168	1.64	123
0.87	146	1.09	143	1.23	146	1.37	103
0.74	125	0.93	122	1.05	125	1.11	83
0.62	104	0.77	101	0.87	104	0.87	65
0.49	83	0.61	81	0.70	83	0.65	60
0.37	63	0.46	61	0.53	63	0.44	60
0.25	60	0.31	60	0.36	60	0.26	60
0.13	60	0.16	60	0.18	60	0.10	60

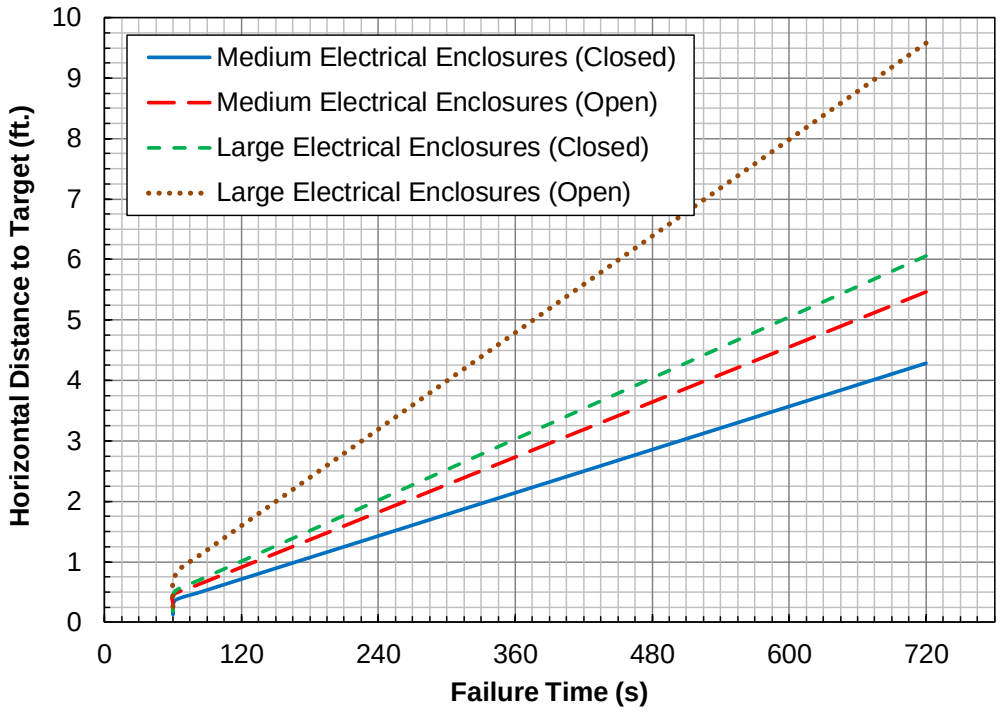

Figure G.09: Failure Time vs. Radial Target Distance for Electrical Enclosures (Set 2) (SE Targets)

AppendixH. DETECTOR ACTUATION AND SPRINKLER ACTIVATION TIMES

TABLE OF CONTENTS

Set H: Overview and Assumptions

Table set H consists of three subsets:

- Tables to determine smoke detector actuation time as a function of the ceiling height above the fire and the radial distance between the detector and the fire (Step 2.7.2).
- Tables to determine sprinkler activation time for fixed and transient ignition source fires as a function of the ceiling height above the fire and the radial distance between the sprinkler head and the fire (Step 2.7.3).
- Tables to determine sprinkler activation time for fires with a priori unknown HRR profile as a function of the ceiling height above the fire and the radial distance between the sprinkler head and the fire (Step 2.7.3).

The assumptions and background for the calculations performed to develop the tables and plots in set A are discussed in Section 06.03.08 of IMC 0308, Attachment 3, Appendix F. The primary assumptions are as follows:

a. To determine response time, smoke detectors are modeled as sprinkler heads with an RTI of 5 $(m \cdot s)^{0.5}$ and an activation temperature 9°F above ambient (86°F). The assumed RTI and activation temperature are identical to those that are used in the sample FDT 11 calculations in NUREG 1805.
b. For the sprinkler activation calculations, sprinkler heads were assumed to have an activation temperature of 165°F and an RTI of 130 $(m \cdot s)^{0.5}$. These values were used in the fire modeling supporting the LAR of several plants transitioning to NFPA 805.

Time (s)	Loose Transient HRR (kW)
0	0
5	1
10	2
15	5
20	9
25	14
30	20
35	27
40	35
45	45
50	55
55	67
60	79
65	93
70	108
75	124
80	141
85	159
90	178
95	199
100	220
105	243
110	266
115	291
120	317

Time (s)	Contained Transient HRR
0	0
20	1
40	2
60	5
80	9
100	14
120	20
140	27
160	35
180	45
200	55
220	67
240	79
260	93
280	108
300	124
320	141
340	159
360	178
380	199
400	220
420	243
440	266
460	291
480	317

Time (s)	Motor HRR (kW)	Pump HRR (kW)	Small Enclosure HRR (kW)	MCC/Battery Charger (kW)	Switchgear/Load Center HRR (kW)	Power Inverter HRR (kW)	Closed Medium Enclosure HRR (kW)	Open Medium Enclosure HRR (kW)	Closed Large Enclosure HRR (kW)	Open Large TS Enclosure HRR (kW)	Open Large TP Enclosure HRR (kW)
0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	1	1	1	2
60	0	1	0	1	1	1	1	2	3	5	7
90	1	3	1	2	3	3	3	5	6	11	16
120	2	6	1	4	5	6	6	9	11	19	28
150	3	9	2	6	7	9	9	14	17	30	43
180	4	13	3	8	11	13	13	20	25	44	63
210	6	18	4	11	14	17	17	28	34	60	85
240	8	23	5	14	19	22	22	36	44	78	111
270	10	30	6	18	24	28	28	46	56	98	141
300	12	37	8	23	30	35	35	56	69	122	174
330	14	44	9	27	36	42	42	68	84	147	210
360	17	53	11	33	43	50	50	81	100	175	250
390	20	62	13	38	50	59	59	95	117	205	293
420	23	72	15	44	58	68	68	111	136	238	340
450	27	82	18	51	66	78	78	127	156	273	391
480	31	94	20	58	76	89	89	144	178	311	444
510	35	106	23	65	85	100	100	163	201	351	502
540	39	119	25	73	96	113	113	183	225	394	563
570	43	132	28	81	107	125	125	204	251	439	627
600	48	147	31	90	118	139	139	226	278	486	694
630	53	162	34	100	130	153	153	249	306	536	766
660	58	177	38	109	143	168	168	273	336	588	840
690	63	194	41	119	156	184	184	298	367	643	918
720	69	211	45	130	170	200	200	325	400	700	1000

Figure H.01: t^2 HRR Growth Profile for Various Ignition Sources

H	Minimum HRR for Detector Actuation in kW as a Function of Radial Distance R in ft.															
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14	R=15
5	2	2	3	5	6	8	9	11	12	14	15	16	18	19	21	22
6	3	3	4	6	8	10	12	14	16	18	20	22	23	25	27	29
7	4	4	5	8	10	13	15	17	20	22	25	27	29	32	34	37
8	5	5	6	9	12	15	18	21	24	27	30	33	36	39	42	45
9	6	6	8	11	15	18	22	25	29	32	36	39	43	46	50	53
10	8	8	9	13	17	21	25	29	33	37	42	46	50	54	58	62
11	10	10	10	15	19	24	29	34	38	43	48	53	57	62	67	72
12	12	12	12	17	22	28	33	38	44	49	55	60	65	71	76	82
13	15	15	15	19	25	31	37	43	49	55	61	68	74	80	86	92
14	18	18	18	21	28	35	41	48	55	62	69	75	82	89	96	103
15	21	21	21	23	31	38	46	53	61	68	76	84	91	99	106	114
16	24	24	24	25	34	42	50	59	67	75	84	92	100	109	117	125
17	28	28	28	28	37	46	55	64	73	82	92	101	110	119	128	137
18	33	33	33	33	40	50	60	70	80	90	100	110	120	130	139	149
19	37	37	37	37	44	54	65	76	87	97	108	119	130	140	151	162
20	42	42	42	42	47	59	70	82	94	105	117	128	140	152	163	175
21	48	48	48	48	51	63	76	88	101	113	126	138	151	163	176	188
22	53	53	53	53	54	68	81	94	108	121	135	148	161	175	188	202
23	60	60	60	60	60	72	87	101	115	130	144	158	173	187	201	216
24	66	66	66	66	66	77	92	107	123	138	153	169	184	199	214	230
25	73	73	73	73	73	82	98	114	130	147	163	179	195	212	228	244
26	81	81	81	81	81	87	104	121	138	156	173	190	207	225	242	259
27	89	89	89	89	89	92	110	128	146	165	183	201	219	238	256	274
28	97	97	97	97	97	97	116	135	155	174	193	212	232	251	270	289
29	106	106	106	106	106	106	122	143	163	183	203	224	244	264	285	305
30	116	116	116	116	116	116	129	150	171	193	214	235	257	278	300	321

Figure H.02: Minimum HRR for Detector Actuation vs. H and R (R Range: 0-15 ft.)

H	Minimum HRR for Detector Actuation in kW as a Function of Radial Distance R in ft.														
(ft.)	R=16	R=17	R=18	R=19	R=20	R=21	R=22	R=23	R=24	R=25	R=26	R=27	R=28	R=29	R=30
5	24	25	27	28	30	31	32	34	35	37	38	40	41	43	44
6	31	33	35	37	39	41	43	44	46	48	50	52	54	56	58
7	39	41	44	46	49	51	53	56	58	61	63	65	68	70	73
8	48	50	53	56	59	62	65	68	71	74	77	80	83	86	89
9	57	60	64	67	71	74	78	81	85	88	92	95	99	102	106
10	66	70	74	79	83	87	91	95	99	103	107	111	116	120	124
11	76	81	86	91	95	100	105	110	114	119	124	129	133	138	143
12	87	92	98	103	109	114	119	125	130	136	141	146	152	157	163
13	98	104	110	116	122	128	135	141	147	153	159	165	171	177	183
14	109	116	123	130	137	143	150	157	164	171	178	184	191	198	205
15	121	129	136	144	152	159	167	174	182	189	197	204	212	219	227
16	134	142	150	159	167	175	184	192	200	208	217	225	233	242	250
17	146	155	164	174	183	192	201	210	219	228	237	246	256	265	274
18	159	169	179	189	199	209	219	229	239	249	259	269	278	288	298
19	173	183	194	205	216	227	237	248	259	270	280	291	302	313	323
20	187	198	210	221	233	245	256	268	280	291	303	314	326	338	349
21	201	213	226	238	251	263	276	288	301	313	326	338	351	363	376
22	215	229	242	255	269	282	296	309	322	336	349	363	376	389	403
23	230	244	259	273	287	302	316	330	345	359	373	388	402	416	431
24	245	260	276	291	306	321	337	352	367	383	398	413	428	444	459
25	260	277	293	309	325	342	358	374	390	407	423	439	455	472	488
26	276	293	311	328	345	362	380	397	414	431	449	466	483	500	517
27	292	310	329	347	365	383	402	420	438	456	475	493	511	529	548
28	309	328	347	366	386	405	424	443	463	482	501	520	540	559	578
29	325	346	366	386	406	427	447	467	488	508	528	549	569	589	609
30	342	364	385	406	428	449	470	492	513	534	556	577	599	620	641

Figure H.03: Minimum HRR for Detector Actuation vs. H and R (R Range: 16-30 ft.)

H	Sum of Plume & Ceiling Jet Lag Times and Detector Response Time in s															
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14	R=15
5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13
6	5	5	6	6	7	7	8	8	9	9	9	10	10	11	11	12
7	5	5	6	6	7	7	7	8	8	8	9	9	9	10	10	11
8	5	5	6	6	6	7	7	7	8	8	8	9	9	9	10	10
9	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9	9
10	5	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9
11	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8
12	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8
13	5	5	5	6	6	6	6	6	6	7	7	7	7	7	8	8
14	5	5	5	6	6	6	6	6	6	7	7	7	7	7	7	8
15	5	5	5	5	6	6	6	6	6	6	7	7	7	7	7	7
16	5	5	5	5	6	6	6	6	6	6	6	7	7	7	7	7
17	5	5	5	5	6	6	6	6	6	6	6	7	7	7	7	7
18	5	5	5	5	6	6	6	6	6	6	6	6	7	7	7	7
19	5	5	5	5	6	6	6	6	6	6	6	6	6	7	7	7
20	5	5	5	5	6	6	6	6	6	6	6	6	6	7	7	7
21	5	5	5	5	6	6	6	6	6	6	6	6	6	6	7	7
22	5	5	5	5	6	6	6	6	6	6	6	6	6	6	7	7
23	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	7
24	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	7
25	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6
26	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6
27	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6
28	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6
29	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6
30	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6

Figure H.04: Total Lag and Response Time vs. H and R (R Range: 0-15 ft.)

H	Sum of Plume & Ceiling Jet Lag Times and Detector Response Time in s														
(ft.)	R=16	R=17	R=18	R=19	R=20	R=21	R=22	R=23	R=24	R=25	R=26	R=27	R=28	R=29	R=30
5	13	14	14	15	15	16	17	17	18	18	19	20	20	21	21
6	12	12	13	13	14	14	15	15	16	16	17	17	18	18	19
7	11	11	12	12	13	13	13	14	14	15	15	16	16	16	17
8	10	11	11	11	12	12	12	13	13	13	14	14	15	15	15
9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14
10	9	9	10	10	10	11	11	11	11	12	12	12	13	13	13
11	9	9	9	9	10	10	10	11	11	11	11	12	12	12	13
12	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12
13	8	8	9	9	9	9	9	10	10	10	10	11	11	11	11
14	8	8	8	8	9	9	9	9	10	10	10	10	10	11	11
15	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10
16	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10
17	7	7	8	8	8	8	8	9	9	9	9	9	9	10	10
18	7	7	7	8	8	8	8	8	8	9	9	9	9	9	10
19	7	7	7	7	8	8	8	8	8	8	9	9	9	9	9
20	7	7	7	7	8	8	8	8	8	8	8	9	9	9	9
21	7	7	7	7	7	8	8	8	8	8	8	8	9	9	9
22	7	7	7	7	7	7	8	8	8	8	8	8	8	9	9
23	7	7	7	7	7	7	7	8	8	8	8	8	8	8	9
24	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8
25	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8
26	7	7	7	7	7	7	7	7	7	7	8	8	8	8	8
27	6	7	7	7	7	7	7	7	7	7	8	8	8	8	8
28	6	7	7	7	7	7	7	7	7	7	7	8	8	8	8
29	6	6	7	7	7	7	7	7	7	7	7	7	8	8	8
30	6	6	7	7	7	7	7	7	7	7	7	7	7	8	8

Figure H.05: Total Lag and Response Time vs. H and R (R Range: 16-30 ft.)

H	Sprinkler Activation Time in Seconds (Motor Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	413	440	602	725	927	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	494	498	665	861	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	579	579	727	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	667	667	834	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	771	771	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.06: Time to Sprinkler Activation vs. H and R (Motor Fires)

H	Sprinkler Activation Time in Seconds (Pump Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	266	284	386	462	525	580	629	674	716	759	815	890	1003	NA	NA
6	314	318	421	505	575	636	690	742	810	919	NA	NA	NA	NA	NA
7	363	363	455	546	623	690	754	856	NA	NA	NA	NA	NA	NA	NA
8	414	414	488	587	670	745	877	NA	NA	NA	NA	NA	NA	NA	NA
9	466	466	520	627	716	844	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	519	519	552	666	774	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	574	574	583	704	939	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	630	630	633	746	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	687	687	688	826	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	751	751	751	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.07: Time to Sprinkler Activation vs. H and R (Pump Fires)

H	Sprinkler Activation Time in Seconds (Loose Transient Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	66	71	94	111	125	140	156	174	193	214	237	266	302	367	NA
6	76	77	100	118	135	154	175	198	225	257	304	NA	NA	NA	NA
7	85	85	106	125	145	169	197	229	272	NA	NA	NA	NA	NA	NA
8	94	94	111	132	157	187	224	276	NA	NA	NA	NA	NA	NA	NA
9	103	103	116	140	170	209	264	NA	NA	NA	NA	NA	NA	NA	NA
10	112	112	120	148	186	238	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	121	121	125	158	205	295	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	131	131	133	169	230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	143	143	144	182	273	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	159	159	159	197	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	182	182	182	218	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	218	218	218	248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.08: Time to Sprinkler Activation vs. H and R (Loose Transient Fires)

H	Sprinkler Activation Time in Seconds (Contained Transient Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	170	182	245	292	330	364	394	421	446	470	493	518	546	578	615
6	198	201	264	315	357	394	427	457	485	514	550	594	648	NA	NA
7	226	226	283	338	383	423	459	492	530	579	647	NA	NA	NA	NA
8	255	255	300	359	408	451	490	535	601	NA	NA	NA	NA	NA	NA
9	284	284	317	380	432	478	528	607	NA	NA	NA	NA	NA	NA	NA
10	313	313	334	401	456	508	590	NA	NA	NA	NA	NA	NA	NA	NA
11	343	343	350	421	480	552	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	374	374	377	441	506	637	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	405	405	406	460	544	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	436	436	436	479	616	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	469	469	469	501	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	505	505	505	531	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	594	594	594	607	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.09: Time to Sprinkler Activation vs. H and R (Contained Transient Fires)

H	Sprinkler Activation Time in Seconds (Small Enclosure Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	492	524	720	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	593	597	862	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	698	698	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.10: Time to Sprinkler Activation vs. H and R (Small Enclosure Fires)

H	Sprinkler Activation Time in Seconds (MCC & Battery Charger Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	321	342	466	559	637	704	774	884	1166	NA	NA	NA	NA	NA	NA
6	381	384	511	615	701	794	1027	NA	NA	NA	NA	NA	NA	NA	NA
7	443	443	555	668	774	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	507	507	598	721	1024	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	573	573	639	795	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	641	641	681	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	711	711	721	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	857	857	868	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.11: Time to Sprinkler Activation vs. H and R (MCC & Battery Charger Fires)

H	Sprinkler Activation Time in Seconds (Switchgear and Load Center Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	289	309	419	503	572	632	686	736	798	887	1048	NA	NA	NA	NA
6	342	346	459	551	627	694	760	862	1141	NA	NA	NA	NA	NA	NA
7	397	397	497	597	682	761	918	NA	NA	NA	NA	NA	NA	NA	NA
8	453	453	534	643	735	913	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	510	510	570	688	825	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	570	570	605	732	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	631	631	640	805	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	693	693	697	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	772	772	774	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.12: Time to Sprinkler Activation vs. H and R (Switchgear & Load Center Fires)

H	Sprinkler Activation Time in Seconds (Power Inverter Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	272	290	394	471	536	592	643	689	732	782	850	946	1125	NA	NA
6	321	324	430	516	587	650	706	763	847	1006	NA	NA	NA	NA	NA
7	371	371	465	559	637	705	778	918	NA	NA	NA	NA	NA	NA	NA
8	423	423	499	600	685	769	972	NA	NA	NA	NA	NA	NA	NA	NA
9	476	476	532	641	734	923	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	531	531	564	682	811	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	587	587	597	721	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	645	645	648	774	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	704	704	705	966	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	787	787	787	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.13: Time to Sprinkler Activation vs. H and R (Power Inverter Fires)

H	Sprinkler Activation Time in Seconds (Closed Medium Enclosure Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	272	290	394	471	536	592	643	689	732	782	850	946	1125	NA	NA
6	321	324	430	516	587	650	706	763	847	1006	NA	NA	NA	NA	NA
7	371	371	465	559	637	705	778	918	NA	NA	NA	NA	NA	NA	NA
8	423	423	499	600	685	769	972	NA	NA	NA	NA	NA	NA	NA	NA
9	476	476	532	641	734	923	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	531	531	564	682	811	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	587	587	597	721	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	645	645	648	774	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	704	704	705	966	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	787	787	787	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.14: Time to Sprinkler Activation vs. H and R (Closed Medium Enclosure Fires)

H	Sprinkler Activation Time in Seconds (Open Medium Enclosure Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	226	242	327	391	444	490	531	568	603	636	666	696	724	753	787
6	266	269	356	426	484	534	580	621	660	696	730	770	818	882	974
7	306	306	383	459	522	578	627	673	715	759	819	911	1103	NA	NA
8	347	347	409	491	560	620	673	723	781	874	1133	NA	NA	NA	NA
9	389	389	435	523	596	661	719	788	929	NA	NA	NA	NA	NA	NA
10	432	432	460	554	632	701	774	955	NA	NA	NA	NA	NA	NA	NA
11	476	476	485	584	668	743	902	NA	NA	NA	NA	NA	NA	NA	NA
12	521	521	525	614	703	814	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	567	567	568	644	739	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	614	614	614	673	798	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	662	662	662	702	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	711	711	711	732	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	781	781	781	791	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.15: Time to Sprinkler Activation vs. H and R (Open Medium Enclosure Fires)

H	Sprinkler Activation Time in Seconds (Closed Large Enclosure Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	210	224	303	361	410	452	490	524	556	586	614	642	667	691	714
6	246	249	328	393	446	492	534	572	607	640	671	701	730	761	798
7	282	282	353	423	481	531	577	618	657	693	727	765	815	880	982
8	319	319	376	452	514	569	618	663	705	746	800	881	1044	NA	NA
9	357	357	399	480	547	606	658	707	756	830	983	NA	NA	NA	NA
10	396	396	422	508	579	642	698	754	847	NA	NA	NA	NA	NA	NA
11	436	436	444	535	611	677	739	838	NA	NA	NA	NA	NA	NA	NA
12	477	477	480	562	642	712	801	NA	NA	NA	NA	NA	NA	NA	NA
13	518	518	519	588	673	752	1029	NA	NA	NA	NA	NA	NA	NA	NA
14	560	560	560	615	703	822	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	603	603	603	641	735	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	647	647	647	666	782	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	692	692	692	697	929	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
18	740	740	740	744	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19	933	933	933	940	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.16: Time to Sprinkler Activation vs. H and R (Closed Large Enclosure Fires)

H	Sprinkler Activation Time in Seconds (Open Large TP Enclosure Fires)														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	151	161	217	258	292	321	347	371	394	414	434	453	470	487	503
6	175	177	233	278	315	347	376	402	426	449	470	490	510	528	546
7	200	200	249	297	337	372	403	431	457	481	504	526	547	568	587
8	224	224	264	315	358	395	428	459	487	513	538	561	583	605	626
9	249	249	279	333	378	418	453	486	516	544	570	595	619	642	665
10	274	274	293	350	398	440	478	512	544	574	602	629	654	678	702
11	300	300	306	367	418	462	502	538	572	604	633	661	688	714	740
12	326	326	329	384	437	484	526	564	599	633	664	694	722	753	795
13	352	352	353	400	456	505	549	589	626	661	694	726	762	813	896
14	379	379	379	416	475	526	572	614	653	690	724	765	826	950	NA
15	406	406	406	432	493	546	594	639	679	718	761	830	1015	NA	NA
16	434	434	434	448	511	567	617	663	706	749	820	1061	NA	NA	NA
17	462	462	462	466	529	587	639	687	732	797	1004	NA	NA	NA	NA
18	490	490	490	493	547	607	661	711	767	907	NA	NA	NA	NA	NA
19	519	519	519	521	565	627	683	736	829	NA	NA	NA	NA	NA	NA
20	549	549	549	549	582	647	705	771	NA	NA	NA	NA	NA	NA	NA
21	578	578	578	578	600	666	727	835	NA	NA	NA	NA	NA	NA	NA
22	609	609	609	609	617	686	754	NA	NA	NA	NA	NA	NA	NA	NA
23	639	639	639	640	644	705	799	NA	NA	NA	NA	NA	NA	NA	NA
24	670	671	671	671	674	725	950	NA	NA	NA	NA	NA	NA	NA	NA
25	702	702	702	702	704	749	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	735	735	735	735	736	787	NA	NA	NA	NA	NA	NA	NA	NA	NA
27	801	801	801	801	801	888	NA	NA	NA	NA	NA	NA	NA	NA	NA
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Figure H.17: Time to Sprinkler Activation vs. H and R (Open Large Enclosure Fires)

H	HRR in kW for Sprinkler Activation in 1 min														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	36	44	103	171	244	322	405	491	581	674	769	868	969	1073	1179
6	55	58	126	206	294	388	487	591	697	808	923	1040	1161	1285	1411
7	78	78	148	242	345	455	570	690	815	945	1078	1214	1355	1498	1645
8	106	106	170	279	397	523	654	792	934	1082	1234	1389	1549	1713	1880
9	139	139	193	316	449	591	740	894	1055	1221	1391	1566	1746	1930	2118
10	178	178	217	354	503	659	825	997	1176	1361	1551	1745	1944	2149	2357
11	221	221	240	392	556	730	913	1102	1299	1502	1711	1925	2145	2369	2598
12	270	270	282	431	610	801	1000	1208	1423	1645	1873	2107	2346	2591	2841
13	326	326	330	470	665	872	1089	1314	1548	1788	2036	2290	2550	2815	3085
14	386	386	386	510	721	945	1179	1422	1674	1934	2201	2474	2754	3040	3331
15	452	452	453	550	777	1017	1269	1531	1802	2080	2366	2660	2961	3267	3580
16	526	526	526	590	834	1091	1360	1640	1929	2228	2534	2848	3168	3495	3830
17	605	605	605	641	891	1165	1453	1751	2059	2376	2702	3037	3378	3726	4081
18	690	690	690	718	949	1241	1545	1862	2190	2526	2873	3227	3589	3958	4335
19	782	783	783	799	1007	1316	1639	1975	2321	2678	3044	3419	3801	4192	4590
20	881	881	881	885	1067	1393	1734	2088	2454	2830	3217	3611	4015	4427	4847
21	986	986	987	987	1126	1471	1830	2203	2588	2984	3390	3806	4231	4664	5105
22	1099	1099	1099	1099	1186	1549	1926	2318	2723	3139	3565	4001	4448	4903	5366
23	1218	1218	1218	1219	1283	1627	2023	2435	2858	3294	3741	4199	4666	5142	5627
24	1345	1345	1345	1345	1397	1706	2122	2551	2995	3451	3919	4397	4886	5384	5891
25	1479	1479	1479	1479	1516	1787	2220	2669	3132	3609	4097	4597	5107	5627	6156
26	1620	1620	1620	1620	1641	1867	2320	2788	3272	3768	4278	4798	5329	5872	6423
27	1768	1768	1768	1769	1769	1948	2419	2908	3411	3929	4458	5000	5554	6118	6691
28	1924	1924	1925	1925	1925	2041	2520	3029	3552	4090	4641	5204	5779	6365	6961
29	2088	2088	2088	2088	2088	2189	2622	3150	3694	4252	4824	5409	6006	6614	7233
30	2259	2259	2259	2259	2260	2344	2725	3272	3836	4416	5009	5615	6234	6865	7506

Figure H.18: Steady HRR for Sprinkler Activation in 1 Minute vs. H and R

H	HRR in kW for Sprinkler Activation in 2 min														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	21	26	58	94	133	173	216	260	305	352	400	450	500	553	605
6	33	34	71	115	162	212	263	317	372	429	487	547	608	671	734
7	48	48	85	137	193	252	313	376	441	508	576	647	719	792	866
8	65	65	100	161	225	293	363	436	511	589	668	748	832	916	1001
9	86	86	115	184	257	335	415	498	584	671	761	853	947	1042	1139
10	111	111	130	208	292	378	468	562	658	756	856	960	1065	1172	1281
11	138	138	147	233	326	423	522	626	733	842	954	1068	1185	1303	1424
12	170	170	175	259	361	468	578	693	810	931	1053	1179	1307	1437	1569
13	206	206	207	286	398	514	636	761	888	1020	1155	1292	1432	1574	1718
14	245	245	246	313	435	561	693	829	969	1111	1258	1407	1558	1713	1870
15	289	289	289	340	472	610	753	899	1051	1205	1363	1524	1688	1854	2023
16	337	337	337	368	511	660	813	971	1133	1300	1470	1642	1818	1997	2179
17	389	389	389	404	550	710	874	1044	1218	1396	1578	1763	1951	2143	2337
18	446	446	446	457	591	761	937	1118	1304	1494	1688	1886	2086	2290	2497
19	508	508	508	515	631	813	1001	1194	1392	1593	1800	2010	2223	2440	2661
20	573	573	573	576	673	866	1066	1270	1480	1695	1913	2136	2363	2592	2826
21	644	644	645	645	716	920	1131	1348	1570	1797	2028	2264	2503	2747	2993
22	720	720	720	720	759	974	1198	1427	1662	1901	2146	2394	2646	2902	3162
23	801	801	801	801	826	1030	1266	1507	1754	2007	2264	2526	2791	3061	3334
24	887	887	887	887	907	1087	1334	1588	1848	2113	2384	2659	2938	3221	3508
25	977	977	977	977	993	1144	1404	1671	1943	2222	2505	2793	3086	3383	3684
26	1074	1074	1074	1074	1082	1202	1475	1755	2040	2332	2628	2930	3236	3547	3862
27	1175	1175	1175	1175	1175	1261	1546	1838	2137	2442	2752	3068	3389	3713	4042
28	1283	1283	1283	1283	1283	1328	1619	1924	2237	2554	2878	3208	3542	3881	4224
29	1395	1395	1395	1395	1395	1434	1693	2011	2337	2668	3006	3349	3697	4051	4408
30	1513	1513	1513	1513	1513	1547	1767	2099	2438	2783	3135	3492	3855	4222	4594

Figure H.19: Steady HRR for Sprinkler Activation in 2 Minutes vs. H and R

H	HRR in kW for Sprinkler Activation in 3 min														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	18	21	45	71	99	128	159	190	223	256	290	325	360	396	433
6	27	27	56	88	123	159	197	235	274	316	357	400	443	486	531
7	39	39	68	107	148	191	236	282	330	378	427	478	529	580	634
8	54	54	80	126	175	225	277	331	386	442	499	558	617	678	739
9	72	72	93	146	202	260	320	382	445	509	574	642	709	779	849
10	92	92	107	167	231	296	364	434	505	578	652	728	804	882	961
11	116	116	121	189	260	334	410	488	568	649	732	816	902	989	1077
12	143	143	146	211	291	373	457	544	632	722	814	907	1002	1098	1196
13	174	174	175	235	322	413	506	601	698	797	898	1000	1105	1210	1318
14	208	208	208	259	355	454	556	660	766	874	985	1097	1210	1325	1442
15	246	246	246	284	388	497	607	720	836	954	1073	1195	1318	1443	1570
16	288	288	288	309	422	540	660	782	908	1034	1164	1295	1429	1564	1700
17	334	334	334	341	458	585	713	846	980	1118	1257	1398	1542	1687	1834
18	384	384	384	389	494	630	769	910	1055	1203	1352	1503	1657	1812	1969
19	437	437	437	441	531	676	825	978	1132	1289	1448	1610	1774	1941	2108
20	496	496	496	497	569	724	883	1045	1210	1377	1547	1720	1894	2071	2249
21	558	558	558	558	608	773	942	1115	1290	1467	1648	1831	2016	2204	2393
22	625	625	625	625	647	823	1002	1185	1371	1559	1751	1944	2140	2339	2540
23	697	697	697	697	709	874	1063	1257	1453	1652	1855	2060	2267	2477	2689
24	773	773	773	773	783	925	1126	1330	1537	1748	1961	2177	2396	2617	2840
25	854	854	854	854	861	978	1189	1405	1623	1845	2069	2297	2527	2759	2994
26	940	940	940	940	944	1031	1254	1480	1710	1943	2179	2418	2660	2904	3151
27	1031	1031	1031	1031	1031	1086	1320	1558	1799	2043	2291	2542	2795	3051	3309
28	1127	1127	1127	1127	1127	1148	1387	1636	1889	2145	2404	2667	2932	3199	3470
29	1228	1228	1228	1228	1228	1246	1455	1716	1980	2248	2519	2794	3071	3351	3634
30	1334	1334	1334	1334	1334	1349	1524	1797	2073	2353	2636	2923	3212	3505	3799

Figure H.20: Steady HRR for Sprinkler Activation in 3 Minutes vs. H and R

H	HRR in kW for Sprinkler Activation in 4 min														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	16	18	39	60	84	108	133	158	185	211	239	267	295	324	353
6	24	25	49	77	106	136	166	198	230	264	297	332	367	402	438
7	35	35	60	94	128	165	201	240	279	318	359	400	442	484	527
8	49	49	72	112	153	195	239	284	329	376	423	472	520	570	620
9	66	66	85	130	178	227	278	330	383	436	491	546	602	660	717
10	86	86	98	150	205	261	319	378	438	499	561	624	688	752	818
11	108	108	111	171	233	296	361	428	496	564	634	705	776	849	922
12	133	133	135	192	261	333	406	480	555	632	709	788	867	948	1030
13	163	163	163	215	292	371	451	534	617	702	787	874	962	1051	1141
14	195	195	195	238	323	409	498	588	680	773	867	963	1059	1157	1255
15	231	231	231	262	355	450	547	645	746	847	950	1054	1159	1265	1372
16	270	270	270	287	388	492	598	704	813	923	1035	1148	1262	1377	1494
17	314	314	314	318	422	535	649	765	883	1002	1123	1244	1368	1492	1618
18	361	361	361	364	458	579	702	827	954	1082	1212	1343	1475	1610	1745
19	413	413	413	414	494	624	756	891	1027	1165	1303	1445	1586	1729	1874
20	469	469	469	469	530	670	812	956	1102	1249	1398	1548	1700	1853	2007
21	529	529	529	529	569	717	869	1022	1178	1335	1494	1654	1816	1978	2143
22	593	593	593	593	608	766	928	1091	1256	1423	1592	1762	1934	2107	2282
23	661	661	661	661	668	816	987	1161	1336	1513	1692	1872	2055	2238	2423
24	734	734	734	734	740	866	1048	1232	1418	1605	1794	1985	2178	2372	2567
25	812	812	812	812	816	919	1110	1304	1501	1699	1898	2100	2304	2508	2714
26	895	895	895	895	897	971	1174	1379	1585	1794	2005	2217	2431	2647	2864
27	983	983	983	983	983	1024	1238	1454	1672	1891	2113	2337	2562	2788	3017
28	1075	1075	1075	1075	1075	1086	1304	1530	1760	1991	2223	2458	2694	2931	3171
29	1173	1173	1173	1173	1173	1182	1371	1609	1849	2091	2335	2581	2829	3078	3329
30	1275	1275	1275	1275	1275	1283	1439	1688	1939	2193	2449	2706	2965	3227	3489

Figure H.21: Steady HRR for Sprinkler Activation in 4 Minutes vs. H and R

H	HRR in kW for Sprinkler Activation in 5 min														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	15	17	36	55	76	97	119	141	163	187	211	235	259	284	309
6	23	23	45	71	96	123	150	178	207	235	265	295	325	356	386
7	34	34	56	87	118	150	184	218	252	286	322	358	395	431	469
8	48	48	68	104	141	180	219	259	300	341	383	425	468	512	556
9	63	63	80	123	167	211	257	303	350	398	447	496	545	595	646
10	82	82	93	142	193	244	296	349	403	458	513	570	626	683	741
11	104	104	107	163	220	278	337	397	458	520	583	646	710	775	840
12	129	129	130	184	248	314	380	448	516	585	656	726	797	870	943
13	157	157	158	206	278	351	424	500	576	653	731	809	888	968	1049
14	189	189	189	229	308	389	471	554	638	723	808	895	983	1071	1159
15	224	224	224	253	340	429	519	610	702	795	889	984	1079	1175	1273
16	263	263	263	277	373	470	568	668	768	869	971	1075	1179	1284	1390
17	306	306	306	308	407	513	619	727	836	946	1057	1169	1282	1395	1509
18	353	353	353	354	442	556	671	789	906	1025	1145	1266	1387	1510	1633
19	404	404	404	404	478	601	726	851	978	1107	1235	1365	1496	1627	1760
20	458	458	458	459	514	647	781	916	1052	1189	1328	1467	1607	1748	1890
21	517	517	517	517	553	695	837	982	1128	1275	1422	1571	1720	1871	2023
22	581	581	581	581	591	743	896	1050	1205	1362	1519	1678	1838	1997	2159
23	648	648	648	648	651	793	955	1119	1285	1451	1619	1787	1957	2126	2298
24	721	721	721	721	723	843	1016	1190	1366	1542	1720	1898	2078	2258	2441
25	797	797	797	797	799	894	1078	1262	1448	1635	1823	2012	2202	2393	2585
26	879	879	879	879	880	948	1141	1336	1533	1730	1928	2128	2329	2531	2733
27	966	966	966	966	966	1001	1206	1412	1619	1827	2036	2246	2457	2670	2884
28	1057	1057	1057	1057	1057	1062	1271	1488	1706	1925	2146	2367	2589	2813	3037
29	1154	1154	1154	1154	1154	1158	1339	1566	1795	2025	2257	2489	2723	2957	3193
30	1255	1255	1255	1255	1255	1259	1407	1646	1886	2127	2370	2614	2859	3105	3352

Figure H.22: Steady HRR for Sprinkler Activation in 5 Minutes vs. H and R

H	HRR in kW for Sprinkler Activation in 6 min														
(ft.)	R=0	R=1	R=2	R=3	R=4	R=5	R=6	R=7	R=8	R=9	R=10	R=11	R=12	R=13	R=14
5	14	16	34	52	71	90	111	130	151	172	193	215	237	259	281
6	23	23	44	67	91	116	140	166	192	218	245	272	299	327	355
7	33	33	55	83	113	143	173	205	236	268	300	333	366	399	433
8	47	47	65	100	135	172	208	245	282	321	359	398	437	477	517
9	62	62	78	119	160	202	245	288	332	376	421	466	512	558	604
10	81	81	91	138	186	234	284	333	384	434	486	538	590	643	697
11	102	102	104	158	213	268	324	381	439	496	555	614	673	733	793
12	127	127	128	179	241	304	367	430	495	560	626	692	759	826	894
13	156	156	156	202	271	340	411	483	555	626	700	773	848	922	998
14	187	187	187	224	302	379	457	536	616	696	777	858	940	1023	1106
15	222	222	222	248	333	418	505	591	679	768	857	946	1036	1126	1218
16	260	260	260	273	366	460	554	650	745	841	939	1036	1135	1233	1333
17	303	303	303	304	400	502	605	709	813	918	1024	1130	1236	1344	1452
18	350	350	350	350	435	546	657	770	883	996	1111	1226	1341	1458	1575
19	400	400	400	400	471	591	711	832	955	1077	1201	1325	1449	1575	1700
20	454	454	454	454	508	637	767	897	1028	1160	1293	1426	1560	1694	1829
21	513	513	513	513	546	684	824	963	1104	1245	1387	1530	1673	1817	1961
22	576	576	576	576	585	733	882	1031	1181	1332	1484	1636	1790	1943	2097
23	644	644	644	644	644	782	941	1100	1261	1422	1583	1746	1908	2072	2236
24	716	716	716	716	716	833	1002	1172	1342	1513	1685	1857	2030	2203	2378
25	792	792	792	792	793	885	1064	1244	1425	1606	1788	1970	2154	2338	2522
26	873	873	873	873	874	938	1128	1318	1509	1701	1894	2087	2280	2475	2670
27	959	959	959	959	959	992	1192	1394	1595	1798	2001	2205	2410	2615	2820
28	1051	1051	1051	1051	1051	1053	1258	1470	1683	1896	2110	2325	2541	2757	2974
29	1147	1147	1147	1147	1147	1149	1325	1548	1772	1997	2222	2448	2675	2902	3130
30	1248	1248	1248	1248	1248	1250	1394	1628	1864	2099	2336	2573	2811	3050	3289

Figure H.23: Steady HRR for Sprinkler Activation in 6 Minutes vs. H and R

ATTACHMENT 1
Revision History for IMC 0609, Appendix F, Attachment 8

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public)
	05/28/2004 CN 04-016	IMC 0609, App F, Att 8 "Guidance for Fire Non-Suppression Probability Analysis," is added to provide guidance for fire non-suppression analysis.		
	02/28/2005 CN 05-007	IMC 0609, App F, Att 8 "Guidance for Fire Non-Suppression Probability Analysis," is revised to correct the mathematical signs within the last bullet before Manual fire suppression on page F8-9.		
	ML17089A411 DRAFT CN 17-XXX	IMC 0609, App F, Att 8 "Guidance for Fire Non-Suppression Probability Analysis," is moved to IMC 0609, App F, Att 7. Attachment 8 is replaced with sets of pre-solved tables and plots that are used in the revised Phase 2 to replace the use of the Fire Dynamics Tools Spreadsheets. CA Note sent 7/18/17 for information only, ML17191A681. Issued 10/11/17 as a draft publically available document to allow for public comments.	November 2017	ML17093A189
	ML18087A413 05/02/18 CN 18-010	Re-issued with new accession number in order to issue as an official revision after receipt of public comments.	Gap training covering changes to the procedure completed November 2017	ML17093A189