



Early Pool Fire Report

Workspace: 72438-4FSRUInvioGNL-12R

Study: Invio GNL Water

Equipment Item: 12R Manichette GNL riempimento FSRU

72438-4FSRUInvioGNL-12R\Invio GNL Water\12R Manichette GNL riempimento FSRU

Material	GAS NATURALE	
East	0	m
North	0	m

Scenario (Leak) : 60mm

72438-4FSRUInvioGNL-12R\Invio GNL Water\12R Manichette GNL riempimento FSRU\60mm

Weather: Category 2/F

Wind speed [m/s]	2
Pasquill stability	F stable - night with moderate clouds and light/moderate wind
Atmospheric temperature [degC]	25
Relative humidity [fraction]	0,75
Solar radiation flux [kW/m2]	0,5

Pool fire model results

Early pool fires are assumed to occur at a time when the initial PVAP rainout rate equals the pool fire burn rate, unless the thus calculated pool fire radius exceeds the maximum PVAP pool radius. For the latter case the early pool fire radius is assumed to be the maximum PVAP pool radius. The pool fire centre is located at the rainout point.

INPUT DATA

Correlation Type: Thomas / Johnson

Surface type	Water
Pool fire elevation	0 m
Maximum exposure duration	20 s



Downwind distance of liquid rainout	0	m
Use two zone pool fire model	No	

OUTPUT DATA

Pool fire diameter	13,8507	m
Downwind distance of pool fire centre	0	m
Pool fire flame length	45,1442	m
Angle between pool fire axis and vertical	32,1619	deg
Flame emissive power	190,282	kW/m ²
Total burn rate	31,1993	kg/s
Radiative fraction	0,259683	fraction

Radiation Intensity Ellipse Results

INPUT DATA

For ellipses 'observer direction' refers to whether inclination is 'fixed' or 'variable'. Orientation is always variable.

Observer direction	Variable	
Exposure duration	20	s
Height of interest	1,7	m

OUTPUT DATA

Radiation intensity

Incident radiation [kW/m ²]	Lethality [%]	View factor	Probability	Dose [(W/m ²) ^{Pr} obitN.s]	Hazard information	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m ²]
3	0	0,0157661	-1,38321	865.119	-	86,2069	88,1149	16,0961	102,303	23863,9



5	0,00017 4704	0,026 2768	0,360 367	1.709.491	-	66,7 322	67,6 212	15,628 4	82,360 6	1417 6,5
7	0,02405	0,036 7875	1,508 83	2.677.313	-	56,2 965	56,2 338	15,341 4	71,637 9	9945 ,55
12,5	6,52536	0,065 692	3,487 89	5.800.162	-	41,3 035	39,7 272	14,001 1	55,304 6	5154 ,95
37,5	98,7381	0,197 076	7,237 73	25.094.924	-	19,9 214	18,2 401	7,3435 4	27,265	1141 ,56

Radiation v Distance Results

INPUT DATA

Maximum distance	102,303	m
Angle from wind direction	0	deg
Observer direction	Variable	
Height of interest	1,7	m

OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m ²]	Lethality level [fraction]
0	190,282	1
2,08782	190,282	1
4,17563	190,282	1
6,26345	190,282	1
8,35127	166,514	1
10,4391	117,813	1
12,5269	92,4517	1
14,6147	76,8119	0,999999
16,7025	65,3939	0,999982
18,7904	57,148	0,999881
20,8782	50,7535	0,999464
22,966	45,4142	0,998082
25,0538	41,2315	0,994789
27,1416	37,6963	0,987951
29,2294	34,5749	0,975033
31,3173	32,0306	0,9554



33,4051	29,5056	0,922105
35,4929	27,1452	0,871764
37,5807	24,9732	0,802371
39,6685	22,9804	0,714392
41,7563	21,1528	0,611571
43,8442	19,4772	0,500688
45,932	17,9414	0,390269
48,0198	16,5346	0,288648
50,1076	15,2468	0,202114
52,1954	14,069	0,133821
54,2832	12,9926	0,0837651
56,3711	12,0095	0,0496
58,4589	11,1121	0,0278205
60,5467	10,2931	0,0148095
62,6345	9,5458	0,00749935
64,7223	8,86382	0,00362208
66,8101	8,24126	0,0016733
68,898	7,67266	0,000741559
70,9858	7,15301	0,000316202
73,0736	6,67771	0,000130109
75,1614	6,24258	5,18109E-05
77,2492	5,84381	2,00221E-05
79,337	5,47798	7,5287E-06
81,4249	5,14196	2,7615E-06
83,5127	4,83294	9,90398E-07
85,6005	4,54841	3,48077E-07
87,6883	4,28609	1,20126E-07
89,7761	4,05078	4,21151E-08
91,8639	3,84408	1,54252E-08
93,9518	3,65141	0
96,0396	3,47163	0
98,1274	3,30374	0
100,215	3,1468	0
102,303	2,99995	0



Weather: Category 5/D

Wind speed [m/s]	5
Pasquill stability	D neutral - little sun and high wind or overcast/windy night
Atmospheric temperature [degC]	25
Relative humidity [fraction]	0,75
Solar radiation flux [kW/m2]	0,5

Pool fire model results

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Correlation Type: Thomas / Johnson

Surface type	Water	
Pool fire elevation	0	m
Maximum exposure duration	20	s
Downwind distance of liquid rainout	0	m
Use two zone pool fire model	No	

OUTPUT DATA

Pool fire diameter	13,8507	m
Downwind distance of pool fire centre	0	m
Pool fire flame length	45,1442	m
Angle between pool fire axis and vertical	49,4554	deg
Flame emissive power	190,282	kW/m2
Total burn rate	31,1993	kg/s
Radiative fraction	0,259683	fraction

Radiation Intensity Ellipse Results

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For ellipses 'observer direction' refers to whether inclination is 'fixed' or 'variable'. Orientation is always variable.

Observer direction	Variable	
Exposure duration	20	s
Height of interest	1,7	m

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Radiation intensity

Incident radiation [kW/m ²]	Lethality [%]	View factor	Probability	Dose [(W/m ²) ^{Pr} obitN.s]	Hazard information	Ellipse half-length [m]	Ellipse half-width [m]	Ellipses centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m ²]
3	0	0,0157661	-1,38321	865.119	-	82,817	86,8335	22,7653	105,582	22592,1
5	0,000174704	0,0262768	0,360367	1.709.491	-	65,3168	67,3618	22,0355	87,3522	13822,6
7	0,024057875	0,0367875	1,50883	2.677.313	-	55,7935	56,589	21,2725	77,0665	9918,95
12,5	6,52536692	0,065692	3,48789	5.800.162	-	42,509	40,984	19,4315	61,9405	5473,24
37,5	98,7381076	0,197076	7,23773	25.094.924	-	23,3868	19,706	12,0013	35,3883	1447,83

Radiation v Distance Results

INPUT DATA

Maximum distance	105,582	m
Angle from wind direction	0	deg
Observer direction	Variable	
Height of interest	1,7	m

OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m ²]	Lethality level [fraction]
0	190,282	1
2,15474	190,282	1
4,30948	190,282	1
6,46423	190,282	1
8,61897	190,282	1
10,7737	125,577	1
12,9285	103,234	1
15,0832	88,5857	1
17,2379	74,5115	0,999998
19,3927	69,1601	0,999992
21,5474	62,0584	0,999962
23,7022	56,4657	0,999861
25,8569	51,6939	0,999571
28,0116	47,7209	0,998895
30,1664	44,2167	0,997446
32,3211	41,1917	0,99474
34,4759	38,5632	0,99018
36,6306	36,2358	0,983026
38,7854	34,1484	0,972455
40,9401	32,2513	0,957563
43,0948	30,0443	0,930713
45,2496	27,5475	0,881989
47,4043	25,0764	0,80626
49,5591	22,7205	0,701056
51,7138	20,5209	0,57138
53,8685	18,497	0,430729
56,0233	16,6554	0,297198
58,178	14,994	0,186419
60,3328	13,5047	0,105974
62,4875	12,1762	0,0546114
64,6423	10,9949	0,0255863
66,797	10,1244	0,0128228



68,9517	9,35009	0,00615527
71,1065	8,6431	0,00279016
73,2612	7,99896	0,00119942
75,416	7,41278	0,00049111
77,5707	6,87961	0,000192375
79,7254	6,39461	7,2398E-05
81,8802	5,95323	2,62828E-05
84,0349	5,55122	9,23931E-06
86,1897	5,18467	3,15625E-06
88,3444	4,85004	1,05122E-06
90,4992	4,54414	3,42379E-07
92,6539	4,26409	1,09347E-07
94,8086	4,00731	3,43305E-08
96,9634	3,77149	1,06196E-08
99,1181	3,55459	0
101,273	3,35476	0
103,428	3,17037	0
105,582	2,99997	0