Jet Fire

Workspace: 72438-2FSRURegas-14R

Study: FSRU in rigassificazione

Equipment Item: 14R Linee BOG da serbatoi

72438-2FSRURegas-14R\FSRU in rigassificazione\14R Linee BOG da serbatoi

Material	**GAS NATURALE**	
East	0	m
North	0	m

Scenario (Leak) : 80mm

72438-2FSRURegas-14R\FSRU in rigassificazione\14R Linee BOG da serbatoi\80mm

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

Jet fire model results

INPUT DATA

Scenario

Elevation	**12,5**	m
Release angle from horizontal	**0**	deg

Jet Fire Parameters

Jet fire method	Cone model	
Wind orientation about the z-axis (anti-clockwise from the East)	**0**	deg
Rotation about the z-axis (anti-clockwise from the east)	**0**	deg
Rate modification factor	3	

Calculated inputs

Mass flow rate	4,64204	kg/s
Temperature after atmospheric expansion	20,43	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	**300**	m/s
Rainout fraction time averaged	**0**	fraction

OUTPUT DATA

Flame emissive power	182,262	kW/m2
Fraction of emissivity	0,192526	fraction
Jet velocity	300	m/s
Flame length	25,1301	m
Frustum length	19,7057	m
Frustum base width	1,78489	m
Frustum tip width	5,22609	m
Frustum lift-off distance	5,69996	m
Flame length in still air	32,6384	m
Hole to flame angle	20,2826	deg
Expanded diameter	0,161691	m
Plane angular rotation	0	deg

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/m2]	Lethality [%]	View factor	Probit	Dose [(W/m2)^ProbitN.s]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m2]
3	0	0,0164599	-1,38321	865.119	22,5392	27,7462	20,0904	42,6296	1964,68
5	0,000174704	0,0274331	0,360367	1.709.491	16,5212	19,4588	18,1666	34,6878	1009,97
7	0,02405	0,0384063	1,50883	2.677.313	12,1067	14,1699	17,1474	29,2541	538,944
12,5	6,52536	0,0685827	3,48789	5.800.162	Not reached	Not reached		18,3275	n/a
37,5	98,7381	0,205748	7,23773	25.094.924	Not reached	Not reached		n/a	n/a

Radiation v Distance Results

INPUT DATA

Maximum distance	48,3677	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	**1,7**	m

OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m2]	Lethality level [fraction]
0	4,10959	5,52244E-08
0,987095	4,63226	4,78933E-07
1,97419	5,18758	3,18495E-06
2,96129	5,78515	1,72402E-05
3,94838	6,37166	6,88952E-05
4,93548	6,9411	0,000215805

5,92257	7,47205	0,000540802
6,90967	7,94569	0,00111178
7,89676	8,34857	0,00192736
8,88386	8,74894	0,00316734
9,87095	9,51139	0,00724792
10,858	10,2538	0,0143269
11,8451	10,8991	0,0238577
12,8322	11,5137	0,0365141
13,8193	11,8746	0,0457736
14,8064	12,2011	0,0553881
15,7935	12,4203	0,062521
16,7806	12,5331	0,0664109
17,7677	12,5413	0,066696
18,7548	12,4466	0,063416
19,7419	12,2522	0,0570009
20,729	11,9623	0,0482378
21,7161	11,5833	0,0381912
22,7032	11,1461	0,0284951
23,6903	10,5949	0,0189234
24,6774	10,0097	0,01159
25,6645	9,38296	0,00636672
26,6516	8,73043	0,00309857
27,6387	8,0676	0,00132068
28,6258	7,40894	0,000488023
29,6129	6,82507	0,000173453
30,6	6,34916	6,56062E-05
31,587	6,0055	2,98382E-05
32,5741	5,67796	1,30264E-05
33,5612	5,35625	5,30051E-06
34,5483	5,04352	2,01493E-06
35,5354	4,74222	7,17633E-07
36,5225	4,45411	2,40263E-07
37,5096	4,17631	7,45425E-08
38,4967	3,91846	2,23567E-08
39,4838	3,67569	0

40,4709	3,44791	0
41,458	3,2348	0
42,4451	3,03587	0
43,4322	2,85048	0
44,4193	2,67793	0
45,4064	2,51749	0
46,3935	2,3684	0
47,3806	2,2299	0
48,3677	2,10123	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

Jet fire model results

INPUT DATA

Scenario

Elevation	**12,5**	m
Release angle from horizontal	**0**	deg

Jet Fire Parameters

Jet fire method	Cone model	
Wind orientation about the z-axis (anti-clockwise from the East)	**0**	deg
Rotation about the z-axis (anti-clockwise from the east)	**0**	deg
Rate modification factor	3	

Calculated inputs

Mass flow rate	4,64204	kg/s
Temperature after atmospheric expansion	20,43	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	**300**	m/s
Rainout fraction time averaged	**0**	fraction

OUTPUT DATA

Flame emissive power	174,295	kW/m2
Fraction of emissivity	0,184571	fraction

Jet velocity	300	m/s
Flame length	27,905	m
Frustum length	22,2864	m
Frustum base width	1,78489	m
Frustum tip width	4,5839	m
Frustum lift-off distance	5,69996	m
Flame length in still air	32,6384	m
Hole to flame angle	10,8557	deg
Expanded diameter	0,161691	m
Plane angular rotation	0	deg

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/m2]	Lethality [%]	View factor	Probit	Dose [(W/m2)^ProbitN.s]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m2]
3	0	0,0172122	-1,38321	865.119	23,3698	27,9006	20,409	43,7788	2048,42
5	0,000174704	0,0286869	0,360367	1.709.491	17,8248	19,7929	19,3224	37,1472	1108,36
7	0,02405	0,0401617	1,50883	2.677.313	13,5672	14,8218	18,7585	32,3257	631,744
12,5	6,52536	0,0717174	3,48789	5.800.162	5,79534	5,06254	18,3092	24,1046	92,1717

37,5	98,7381	0,215152	7,23773	25.094.924		Not reached	Not reached	n/a	n/a

Radiation v Distance Results

INPUT DATA

Maximum distance	55,175	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	**1,7**	m

OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m2]	Lethality level [fraction]
0	4,24735	1,01744E-07
1,12602	4,80771	9,06448E-07
2,25204	5,43081	6,58213E-06
3,37806	6,0471	3,29632E-05
4,50408	6,65242	0,0001237
5,63011	7,21002	0,000349171
6,75613	7,69771	0,00077052
7,88215	8,49146	0,00231369
9,00817	9,50724	0,00721804
10,1342	10,4374	0,0166834
11,2602	11,2729	0,0311055
12,3862	11,9984	0,0492782
13,5123	12,6104	0,069157
14,6383	13,1096	0,0885741
15,7643	13,4954	0,105543
16,8903	13,7678	0,118528
18,0163	13,9229	0,126282
19,1424	13,9552	0,12793
20,2684	13,8601	0,123115
21,3944	13,6297	0,111842

22,5204	13,259	0,0949435
23,6464	12,7475	0,0742035
24,7725	12,101	0,0523114
25,8985	11,3328	0,0323962
27,0245	10,4656	0,0170695
28,1505	9,52989	0,0073823
29,2765	8,56166	0,00252531
30,4026	7,7973	0,000895178
31,5286	7,33277	0,000430172
32,6546	6,85986	0,00018533
33,7806	6,37972	7,01079E-05
34,9067	5,88239	2,20604E-05
36,0327	5,42901	6,54825E-06
37,1587	4,99565	1,72211E-06
38,2847	4,58712	4,03805E-07
39,4107	4,20891	8,60716E-08
40,5368	3,85547	1,63391E-08
41,6628	3,53176	0
42,7888	3,23668	0
43,9148	2,9686	0
45,0408	2,72562	0
46,1669	2,5057	0
47,2929	2,30678	0
48,4189	2,12688	0
49,5449	1,96413	0
50,6709	1,81681	0
51,797	1,68332	0
52,923	1,56224	0
54,049	1,45226	0
55,175	1,35224	0