

Jet Fire

Workspace: 72341-2FSRURegas

Study: FSRU in rigassificazione

Equipment Item: 9R Compressore BOG LD

72341-2FSRURegas\FSRU in rigassificazione\9R Compressore BOG LD

Material	GAS NATURALE	
East	0	m
North	0	m

Scenario (Leak) : 25mm

72341-2FSRURegas\FSRU in rigassificazione\9R Compressore BOG LD\25mm

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	
Crosswind angle	0	deg
Rate modification factor	3	

Calculated inputs

Mass flow rate	0,440366	kg/s
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Temperature after atmospheric expansion	21,2178	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	300	m/s
Rainout fraction time averaged	0	fraction

OUTPUT DATA

Flame emissive power	85,15	kW/m2
Fraction of emissivity	0,102554	fraction
Jet velocity	300	m/s
Flame length	9,68667	m
Frustum length	7,96805	m
Frustum base width	0,36373	m
Frustum tip width	1,57224	m
Frustum lift-off distance	1,75559	m
Flame length in still air	11,6872	m
Hole to flame angle	13,0063	deg
Expanded diameter	0,0515091	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 radiati	Lethality [%]	View factor	Probit	Dose [(W/m2)^ProbitN.s]	Ellipse half-	Ellipse half-	Effect downwind	Ellipse area
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on [kW/m ²]					length [m]	width [m]	distance [m]	[m ²]
3	0	0,03523 19	- 1,3832 1	865.119	Not reach ed	Not reach ed	n/a	n/a
5	0,000174 704	0,05871 99	0,3603 67	1.709.491	Not reach ed	Not reach ed	n/a	n/a
7	0,02405	0,08220 79	1,5088 3	2.677.313	Not reach ed	Not reach ed	n/a	n/a
12,5	6,52536	0,1468	3,4878 9	5.800.162	Not reach ed	Not reach ed	n/a	n/a
37,5	98,7381	0,44039 9	7,2377 3	25.094.924	Not reach ed	Not reach ed	n/a	n/a

Radiation v Distance Results

INPUT DATA

Maximum distance	19,0385	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/m ²]	Lethality level [fraction]
0	0,757934	0
0,38854	0,787984	0
0,77708	0,817682	0
1,16562	0,84682	0
1,55416	0,875184	0
1,9427	0,902557	0
2,33124	0,928726	0

2,71978	0,95348	0
3,10832	0,976619	0
3,49686	1,00081	0
3,8854	1,03372	0
4,27394	1,064	0
4,66248	1,09183	0
5,05102	1,11626	0
5,43956	1,13702	0
5,8281	1,15384	0
6,21664	1,16654	0
6,60518	1,17497	0
6,99372	1,17908	0
7,38226	1,17882	0
7,7708	1,17426	0
8,15934	1,16548	0
8,54788	1,15266	0
8,93642	1,13601	0
9,32496	1,11579	0
9,7135	1,09229	0
10,102	1,06586	0
10,4906	1,03685	0
10,8791	1,00563	0
11,2677	0,972589	0
11,6562	0,940982	0
12,0447	0,912623	0
12,4333	0,883615	0
12,8218	0,861361	0
13,2104	0,838437	0
13,5989	0,815003	0
13,9874	0,791214	0
14,376	0,767214	0
14,7645	0,743135	0
15,1531	0,719098	0
15,5416	0,695211	0
15,9301	0,671572	0



16,3187	0,648265	0
16,7072	0,625363	0
17,0958	0,602928	0
17,4843	0,581012	0
17,8728	0,559657	0
18,2614	0,538894	0
18,6499	0,51875	0
19,0385	0,499242	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	
Crosswind angle	0	deg
Rate modification factor	3	

Calculated inputs

Mass flow rate	0,440366	kg/s
Temperature after atmospheric expansion	21,2178	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	300	m/s
Rainout fraction time averaged	0	fraction

OUTPUT DATA

Flame emissive power	78,0784	kW/m2
Fraction of emissivity	0,0924928	fraction
Jet velocity	300	m/s
Flame length	10,6871	m
Frustum length	8,94425	m

Frustum base width	0,36373	m
Frustum tip width	1,36622	m
Frustum lift-off distance	1,75559	m
Flame length in still air	11,6872	m
Hole to flame angle	7,55521	deg
Expanded diameter	0,0515091	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/m ²]	Lethality [%]	View factor	Probit	Dose [(W/m ²) ^{Probit} N.s]	Ellipse half-length [m]	Ellipse half-width [m]	Effect downwind distance [m]	Ellipse area [m ²]
3	0	0,0384229	-1,38321	865.119	Not reached	Not reached	n/a	n/a
5	0,000174704	0,0640382	0,360367	1.709.491	Not reached	Not reached	n/a	n/a
7	0,02405	0,0896534	1,50883	2.677.313	Not reached	Not reached	n/a	n/a
12,5	6,52536	0,160095	3,48789	5.800.162	Not reached	Not reached	n/a	n/a

37,5	98,7381	0,48028	7,2377	25.094.924	Not reach ed	Not reach ed	n/a	n/a
		6	3					

Radiation v Distance Results

INPUT DATA

Maximum distance	21,2444	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	0,694654	0
0,433559	0,725023	0
0,867118	0,755077	0
1,30068	0,784574	0
1,73424	0,813268	0
2,1678	0,84091	0
2,60136	0,867749	0
3,03491	0,907433	0
3,46847	0,945733	0
3,90203	0,981477	0
4,33559	1,01483	0
4,76915	1,04488	0
5,20271	1,07119	0
5,63627	1,09337	0
6,06983	1,11108	0
6,50339	1,12405	0
6,93695	1,13235	0
7,37051	1,13526	0
7,80407	1,13303	0
8,23762	1,12571	0

8,67118	1,11341	0
9,10474	1,09633	0
9,5383	1,07477	0
9,97186	1,04907	0
10,4054	1,01965	0
10,839	0,98699	0
11,2725	0,951837	0
11,7061	0,917236	0
12,1397	0,887518	0
12,5732	0,862542	0
13,0068	0,83753	0
13,4403	0,811531	0
13,8739	0,784789	0
14,3075	0,757146	0
14,741	0,729625	0
15,1746	0,702021	0
15,6081	0,674517	0
16,0417	0,647274	0
16,4752	0,620435	0
16,9088	0,59412	0
17,3424	0,56843	0
17,7759	0,543448	0
18,2095	0,51924	0
18,643	0,495853	0
19,0766	0,473324	0
19,5102	0,451673	0
19,9437	0,430911	0
20,3773	0,411041	0
20,8108	0,392055	0
21,2444	0,373942	0

