

Jet Fire

Workspace: 72438-2FSRURegas-9R

Study: FSRU in rigassificazione-ME7

Equipment Item: 9Rb Compressore BOG LD

72438-2FSRURegas-9R\FSRU in rigassificazione-ME7\9Rb Compressore BOG LD

Material	GAS NATURALE	
East	0	m
North	0	m

Scenario (Leak) : 25mm

72438-2FSRURegas-9R\FSRU in rigassificazione-ME7\9Rb 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
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	0,453325	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	86,3108	kW/m ²
Fraction of emissivity	0,102997	fraction
Jet velocity	300	m/s
Flame length	9,75613	m
Frustum length	8,01243	m
Frustum base width	0,36762	m
Frustum tip width	1,5817	m
Frustum lift-off distance	1,78124	m
Flame length in still air	11,7764	m
Hole to flame angle	13,0189	deg
Expanded diameter	0,0505286	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) [^] ProbitN.s]	Ellipse half-length [m]	Ellipse half-width [m]	Effect downwind distance [m]	Ellipse area [m ²]
3	0	0,0347581	-1,38321	865.119	Not reached	Not reached	n/a	n/a
5	0,000174704	0,0579302	0,360367	1.709.491	Not reached	Not reached	n/a	n/a
7	0,02405	0,0811022	1,50883	2.677.313	Not reached	Not reached	n/a	n/a
12,5	6,52536	0,144825	3,48789	5.800.162	Not reached	Not reached	n/a	n/a
37,5	98,7381	0,434476	7,23773	25.094.924	Not reached	Not reached	n/a	n/a

Radiation v Distance Results

INPUT DATA

Maximum distance	19,1754	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	0,773043	0
0,391335	0,804015	0
0,78267	0,834638	0
1,17401	0,864696	0

1,56534	0,893968	0
1,95668	0,922227	0
2,34801	0,94925	0
2,73935	0,974819	0
3,13068	0,998724	0
3,52202	1,02357	0
3,91335	1,0576	0
4,30469	1,08893	0
4,69602	1,11773	0
5,08736	1,14303	0
5,47869	1,16451	0
5,87003	1,18193	0
6,26136	1,19508	0
6,6527	1,20382	0
7,04403	1,20806	0
7,43537	1,2078	0
7,8267	1,20306	0
8,21804	1,19397	0
8,60937	1,18069	0
9,00071	1,16344	0
9,39204	1,1425	0
9,78338	1,11817	0
10,1747	1,09082	0
10,566	1,06081	0
10,9574	1,02853	0
11,3487	0,994376	0
11,7401	0,961889	0
12,1314	0,932616	0
12,5227	0,902991	0
12,9141	0,880017	0
13,3054	0,856362	0
13,6967	0,832194	0
14,0881	0,807671	0
14,4794	0,782943	0
14,8707	0,758146	0



15,2621	0,733405	0
15,6534	0,708831	0
16,0447	0,684525	0
16,4361	0,660573	0
16,8274	0,637049	0
17,2187	0,614017	0
17,6101	0,591528	0
18,0014	0,569626	0
18,3928	0,548342	0
18,7841	0,527702	0
19,1754	0,507723	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	0,453325	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	79,2159	kW/m2
Fraction of emissivity	0,0929879	fraction

Jet velocity	300	m/s
Flame length	10,7531	m
Frustum length	8,98495	m
Frustum base width	0,36762	m
Frustum tip width	1,37597	m
Frustum lift-off distance	1,78124	m
Flame length in still air	11,7764	m
Hole to flame angle	7,61395	deg
Expanded diameter	0,0505286	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	0,0378712	-1,38321	865.119	Not reached	Not reached	n/a	n/a
5	0,000174704	0,0631186	0,360367	1.709.491	Not reached	Not reached	n/a	n/a
7	0,02405	0,0883661	1,50883	2.677.313	Not reached	Not reached	n/a	n/a

12,5	6,52536	0,15779 7	3,4878 9	5.800.162	Not reach ed	Not reach ed	n/a	n/a
37,5	98,7381	0,47339	7,2377 3	25.094.924	Not reach ed	Not reach ed	n/a	n/a

Radiation v Distance Results

INPUT DATA

Maximum distance	21,3739	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	0,709058	0
0,436203	0,740339	0
0,872405	0,771309	0
1,30861	0,801717	0
1,74481	0,831308	0
2,18101	0,859823	0
2,61722	0,887008	0
3,05342	0,927783	0
3,48962	0,96733	0
3,92582	1,00429	0
4,36203	1,0388	0
4,79823	1,06991	0
5,23443	1,09716	0
5,67064	1,12016	0
6,10684	1,13854	0
6,54304	1,15203	0
6,97924	1,16069	0
7,41545	1,16378	0



7,85165	1,16157	0
8,28785	1,15408	0
8,72405	1,14144	0
9,16026	1,12387	0
9,59646	1,10165	0
10,0327	1,07516	0
10,4689	1,04483	0
10,9051	1,01115	0
11,3413	0,974904	0
11,7775	0,939072	0
12,2137	0,908444	0
12,6499	0,882629	0
13,0861	0,856864	0
13,5223	0,83009	0
13,9585	0,802559	0
14,3947	0,774107	0
14,8309	0,745791	0
15,2671	0,7174	0
15,7033	0,689123	0
16,1395	0,661124	0
16,5757	0,633551	0
17,0119	0,606528	0
17,4481	0,580158	0
17,8843	0,554525	0
18,3205	0,529695	0
18,7567	0,505718	0
19,1929	0,48263	0
19,6291	0,46045	0
20,0653	0,43919	0
20,5015	0,41885	0
20,9377	0,399422	0
21,3739	0,380895	0

