

# Jet Fire

## Workspace: 72438-1RiempFSRU-2R

### Study: Riempimento FSRU-ME7

#### Equipment Item: 2Rb Compressore BOG HD

72438-1RiempFSRU-2R\Riempimento FSRU-ME7\2Rb Compressore BOG HD

Material	<b>GAS NATURALE</b>	
East	0	m
North	0	m

### Scenario (Leak) : 25mm

72438-1RiempFSRU-2R\Riempimento FSRU-ME7\2Rb Compressore BOG HD\25mm

#### Weather: Category 2/F

Wind speed [m/s]	2
Pasquill stability	<b>F stable - night with moderate clouds and light/moderate wind</b>
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	0,152072	kg/s
Temperature after atmospheric expansion	-134,871	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	<b>300</b>	m/s
Rainout fraction time averaged	<b>0</b>	fraction

## OUTPUT DATA

Flame emissive power	55,088	kW/m2
Fraction of emissivity	0,0635068	fraction
Jet velocity	300	m/s
Flame length	6,02482	m
Frustum length	5,00809	m
Frustum base width	0,168082	m
Frustum tip width	0,852982	m
Frustum lift-off distance	1,03167	m
Flame length in still air	7,2622	m
Hole to flame angle	10,7166	deg
Expanded diameter	0,0198793	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	<b>1,7</b>	m

### OUTPUT DATA

#### Radiation intensity

Incident radiation [kW/m <sup>2</sup> ]	Lethality [%]	View factor	Probit	Dose [(W/m <sup>2</sup> ) <sup>^</sup> ProbitN.s]	Ellipse half-length [m]	Ellipse half-width [m]	Effect downwind distance [m]	Ellipse area [m <sup>2</sup> ]
3	0	0,0544583	-1,38321	865.119	Not reached	Not reached	n/a	n/a
5	0,000174704	0,0907639	0,360367	1.709.491	Not reached	Not reached	n/a	n/a
7	0,02405	0,127069	1,50883	2.677.313	Not reached	Not reached	n/a	n/a
12,5	6,52536	0,22691	3,48789	5.800.162	Not reached	Not reached	n/a	n/a
37,5	98,7381	0,680729	7,23773	25.094.924	Not reached	Not reached	n/a	n/a

## Radiation v Distance Results

### INPUT DATA

Maximum distance	11,9048	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	<b>1,7</b>	m

### OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m <sup>2</sup> ]	Lethality level [fraction]
0	0,226788	0
0,242956	0,231406	0
0,485911	0,235881	0
0,728867	0,240193	0



0,971823	0,244323	0
1,21478	0,248253	0
1,45773	0,251964	0
1,70069	0,255438	0
1,94365	0,25866	0
2,1866	0,261612	0
2,42956	0,264941	0
2,67251	0,268802	0
2,91547	0,272255	0
3,15842	0,275297	0
3,40138	0,277926	0
3,64434	0,280089	0
3,88729	0,281771	0
4,13025	0,282963	0
4,3732	0,283659	0
4,61616	0,283858	0
4,85911	0,283561	0
5,10207	0,282772	0
5,34503	0,2815	0
5,58798	0,279757	0
5,83094	0,277559	0
6,07389	0,274923	0
6,31685	0,27187	0
6,55981	0,268423	0
6,80276	0,264609	0
7,04572	0,260452	0
7,28867	0,255982	0
7,53163	0,251776	0
7,77458	0,247698	0
8,01754	0,243441	0
8,2605	0,23944	0
8,50345	0,236014	0
8,74641	0,232435	0
8,98936	0,228721	0
9,23232	0,224888	0



9,47527	0,220951	0
9,71823	0,216924	0
9,96119	0,212824	0
10,2041	0,208664	0
10,4471	0,204458	0
10,6901	0,200218	0
10,933	0,195957	0
11,176	0,191687	0
11,4189	0,187417	0
11,6619	0,183158	0
11,9048	0,178919	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	0,152072	kg/s
Temperature after atmospheric expansion	-134,871	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	300	m/s
Rainout fraction time averaged	0	fraction

### OUTPUT DATA

Flame emissive power	50,9324	kW/m2
Fraction of emissivity	0,0540849	fraction

Jet velocity	300	m/s
Flame length	6,51376	m
Frustum length	5,48793	m
Frustum base width	0,168082	m
Frustum tip width	0,70654	m
Frustum lift-off distance	1,03167	m
Flame length in still air	7,2622	m
Hole to flame angle	6,64836	deg
Expanded diameter	0,0198793	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	<b>1,7</b>	m

### OUTPUT DATA

#### Radiation intensity

Incident radiation [kW/m <sup>2</sup> ]	Lethality [%]	View factor	Probit	Dose [(W/m <sup>2</sup> ) <sup>Probit</sup> N.s]	Ellipse half-length [m]	Ellipse half-width [m]	Effect downwind distance [m]	Ellipse area [m <sup>2</sup> ]
3	0	0,0589016	-1,38321	865.119	Not reached	Not reached	n/a	n/a
5	0,000174704	0,0981693	0,360367	1.709.491	Not reached	Not reached	n/a	n/a
7	0,02405	0,137437	1,50883	2.677.313	Not reached	Not reached	n/a	n/a

12,5	6,52536	0,24542 3	3,4878 9	5.800.162	Not reach ed	Not reach ed	n/a	n/a
37,5	98,7381	0,73627	7,2377 3	25.094.924	Not reach ed	Not reach ed	n/a	n/a

## Radiation v Distance Results

### INPUT DATA

Maximum distance	12,9654	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	<b>1,7</b>	m

### OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m <sup>2</sup> ]	Lethality level [fraction]
0	0,198134	0
0,2646	0,202555	0
0,5292	0,206838	0
0,7938	0,21096	0
1,0584	0,214901	0
1,323	0,21864	0
1,5876	0,222157	0
1,8522	0,225974	0
2,1168	0,230512	0
2,3814	0,234713	0
2,646	0,238564	0
2,9106	0,241995	0
3,1752	0,244979	0
3,4398	0,247495	0
3,7044	0,249521	0
3,969	0,251042	0
4,2336	0,252046	0
4,4982	0,252527	0





4,7628	0,252481	0
5,0274	0,251911	0
5,292	0,250822	0
5,5566	0,249226	0
5,8212	0,247136	0
6,0858	0,244574	0
6,3504	0,241559	0
6,615	0,238119	0
6,8796	0,234283	0
7,1442	0,23008	0
7,4088	0,226081	0
7,6734	0,222297	0
7,938	0,218712	0
8,2026	0,215405	0
8,4672	0,211907	0
8,7318	0,208239	0
8,9964	0,204419	0
9,261	0,200467	0
9,5256	0,196403	0
9,7902	0,192244	0
10,0548	0,18801	0
10,3194	0,183717	0
10,584	0,179381	0
10,8486	0,175019	0
11,1132	0,170645	0
11,3778	0,166273	0
11,6424	0,161915	0
11,907	0,157583	0
12,1716	0,153288	0
12,4362	0,149038	0
12,7008	0,144842	0
12,9654	0,140708	0

