Jet Fire

Workspace: 72438-1RiempFSRU-1H

Study: Riempimento FSRU-ME4

Equipment Item: 1H Sistema BOG

72438-1RiempFSRU-1H\Riempimento FSRU-ME4\1H Sistema BOG

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

Scenario (User defined source) : 350mm-Q0,1

72438-1RiempFSRU-1H\Riempimento FSRU-ME4\1H Sistema BOG\350mm-Q0,1

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	**25**	m
Release angle from horizontal	**90**	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	0,1	kg/s
Temperature after atmospheric expansion	10,9061	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	**242,433**	m/s
Rainout fraction time averaged	**0**	fraction

OUTPUT DATA

Flame emissive power	88,2226	kW/m2
Fraction of emissivity	0,205971	fraction
Jet velocity	242,433	m/s
Flame length	4,54139	m
Frustum length	3,77362	m
Frustum base width	0,29767	m
Frustum tip width	1,3681	m
Frustum lift-off distance	0,788658	m
Flame length in still air	6,31487	m
Hole to flame angle	14,521	deg
Expanded diameter	0,0259639	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

Incide	Lethalit	View	Probit	Dose	Ellip	Ellip	Effect	Ellip

nt radiation [kW/m2]	y [%]	factor		[(W/m2)^ProbitN.s]	se half-length [m]	se half-width [m]	downwind distance [m]	se area [m2]
3	0	0,0340049	-1,38321	865.119	Not reached	Not reached	n/a	n/a
5	0,000174704	0,0566748	0,360367	1.709.491	Not reached	Not reached	n/a	n/a
7	0,02405	0,0793448	1,50883	2.677.313	Not reached	Not reached	n/a	n/a
12,5	6,52536	0,141687	3,48789	5.800.162	Not reached	Not reached	n/a	n/a
37,5	98,7381	0,425061	7,23773	25.094.924	Not reached	Not reached	n/a	n/a

Radiation v Distance Results

INPUT DATA

Maximum distance	1,89235	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	0,0471991	0
0,0386194	0,0473139	0
0,0772387	0,0474288	0
0,115858	0,0475436	0
0,154477	0,0476585	0

0,193097	0,0477733	0
0,231716	0,0478882	0
0,270336	0,048003	0
0,308955	0,0481178	0
0,347574	0,0482325	0
0,386194	0,0483472	0
0,424813	0,0484619	0
0,463432	0,0485765	0
0,502052	0,048691	0
0,540671	0,0488055	0
0,57929	0,0489199	0
0,61791	0,0490342	0
0,656529	0,0491484	0
0,695149	0,0492625	0
0,733768	0,0493765	0
0,772387	0,0494904	0
0,811007	0,0496042	0
0,849626	0,0497178	0
0,888245	0,0498313	0
0,926865	0,0499447	0
0,965484	0,0500579	0
1,0041	0,050171	0
1,04272	0,0502839	0
1,08134	0,0503967	0
1,11996	0,0505093	0
1,15858	0,0506217	0
1,1972	0,050734	0
1,23582	0,050846	0
1,27444	0,0509579	0
1,31306	0,0510696	0
1,35168	0,0511811	0
1,3903	0,0512924	0
1,42892	0,0514035	0
1,46754	0,0515144	0
1,50616	0,051625	0

1,54477	0,0517355	0
1,58339	0,0518457	0
1,62201	0,0519556	0
1,66063	0,0520654	0
1,69925	0,0521749	0
1,73787	0,0522841	0
1,77649	0,0523931	0
1,81511	0,0525019	0
1,85373	0,0526104	0
1,89235	0,0527186	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	**25**	m
Release angle from horizontal	**90**	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	0,1	kg/s
Temperature after atmospheric expansion	10,9061	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	**242,433**	m/s
Rainout fraction time averaged	**0**	fraction

OUTPUT DATA

Flame emissive power	117,712	kW/m2
Fraction of emissivity	0,205971	fraction

Jet velocity	242,433	m/s
Flame length	3,53015	m
Frustum length	3,09875	m
Frustum base width	0,268424	m
Frustum tip width	1,23038	m
Frustum lift-off distance	0,518692	m
Flame length in still air	6,31487	m
Hole to flame angle	36,3024	deg
Expanded diameter	0,0259639	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]	Effect downwind distance [m]	Ellipse area [m2]
3	0	0,0254859	-1,38321	865.119	Not reached	Not reached	n/a	n/a
5	0,000174704	0,0424765	0,360367	1.709.491	Not reached	Not reached	n/a	n/a
7	0,02405	0,0594671	1,50883	2.677.313	Not reached	Not reached	n/a	n/a

12,5	6,52536	0,106191	3,48789	5.800.162	Not reached	Not reached	n/a	n/a
37,5	98,7381	0,318574	7,23773	25.094.924	Not reached	Not reached	n/a	n/a

Radiation v Distance Results

INPUT DATA

Maximum distance	3,66921	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	0,081485	0
0,0748818	0,0817129	0
0,149764	0,0819389	0
0,224645	0,082163	0
0,299527	0,0823851	0
0,374409	0,0826051	0
0,449291	0,0828232	0
0,524172	0,0830392	0
0,599054	0,0832531	0
0,673936	0,083465	0
0,748818	0,0836748	0
0,8237	0,0838824	0
0,898581	0,0840879	0
0,973463	0,0842913	0
1,04834	0,0844924	0
1,12323	0,0846914	0
1,19811	0,0848882	0
1,27299	0,0850827	0

1,34787	0,085275	0
1,42275	0,0854651	0
1,49764	0,0856528	0
1,57252	0,0858383	0
1,6474	0,0860215	0
1,72228	0,0862023	0
1,79716	0,0863808	0
1,87204	0,0865569	0
1,94693	0,0867307	0
2,02181	0,0869021	0
2,09669	0,0870711	0
2,17157	0,0872377	0
2,24645	0,0874018	0
2,32134	0,0875636	0
2,39622	0,0877228	0
2,4711	0,0878797	0
2,54598	0,088034	0
2,62086	0,0881859	0
2,69574	0,0883353	0
2,77063	0,0884821	0
2,84551	0,0886265	0
2,92039	0,0887684	0
2,99527	0,0889077	0
3,07015	0,0890444	0
3,14503	0,0891787	0
3,21992	0,0893103	0
3,2948	0,0894394	0
3,36968	0,089566	0
3,44456	0,0896899	0
3,51944	0,0898113	0
3,59433	0,0899301	0
3,66921	0,0900463	0