

Jet Fire

Workspace: 72452 Ottimizz-00

Study: FSRU in rigassificazione

Equipment Item: 13R Linea second riscaldatori

72452 Ottimizz-00\FSRU in rigassificazione\13R Linea second riscaldatori

Material	GAS NATURALE	
East	0	m
North	0	m

Scenario (Leak) : 30mm

72452 Ottimizz-00\FSRU in rigassificazione\13R Linea second riscaldatori\30mm

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	0,459004	kg/s
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Temperature after atmospheric expansion	6,73324	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	300	m/s
Rainout fraction time averaged	0	fraction

OUTPUT DATA

Flame emissive power	86,5024	kW/m2
Fraction of emissivity	0,104257	fraction
Jet velocity	300	m/s
Flame length	9,8637	m
Frustum length	8,1096	m
Frustum base width	0,374453	m
Frustum tip width	1,60885	m
Frustum lift-off distance	1,79236	m
Flame length in still air	11,9029	m
Hole to flame angle	13,099	deg
Expanded diameter	0,0512669	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	10,7	m

OUTPUT DATA

Radiation intensity

Incident radiation	Lethality [%]	View factor	Probability	Dose [(W/m2)^ProbabilityN.s]	Ellipse half-	Ellipse half-	Ellipse centre downw	Effect downwind	Ellipse area
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on [kW/ m2]					length [m]	width [m]	ind distance [m]	distance [m]	[m2]
3	0	0,0346 811	- 1,383 21	865.119	6,388 32	6,968 48	7,038	13,4263	139,8 54
5	0,00017 4704	0,0578 019	0,360 367	1.709.491	5,047 22	4,855 22	6,62787	11,6751	76,98 6
7	0,02405	0,0809 226	1,508 83	2.677.313	4,034 99	3,522 99	6,28467	10,3197	44,65 85
12,5	6,52536	0,1445 05	3,487 89	5.800.162	Not reach ed	Not reach ed		8,31272	n/a
37,5	98,7381	0,4335 14	7,237 73	25.094.924	Not reach ed	Not reach ed		n/a	n/a

Radiation v Distance Results

INPUT DATA

Maximum distance	19,3819	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	10,7	m

OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m2]	Lethality level [fraction]
0	1,95727	0
0,395549	2,54022	0
0,791098	3,28045	0
1,18665	4,12006	5,79162E-08
1,5822	5,00292	1,76397E-06
1,97775	5,65851	1,23682E-05
2,3733	6,88982	0,000196109
2,76884	8,2816	0,00176537

3,16439	9,40986	0,00654398
3,55994	10,3077	0,0149917
3,95549	11,0324	0,026288
4,35104	11,6308	0,039364
4,74659	12,1318	0,0532464
5,14214	12,5506	0,0670249
5,53769	12,8956	0,0798978
5,93324	13,166	0,0909486
6,32879	13,3569	0,0992578
6,72434	13,4572	0,103787
7,11989	13,4893	0,105262
7,51543	13,3087	0,0971215
7,91098	13,0064	0,0843253
8,30653	12,5103	0,065613
8,70208	11,7945	0,0435969
9,09763	10,8787	0,0235004
9,49318	9,70743	0,0087721
9,88873	8,42735	0,00213325
10,2843	7,10689	0,000291503
10,6798	6,14292	4,1275E-05
11,0754	5,83473	1,95671E-05
11,4709	5,28755	4,32179E-06
11,8665	4,74335	7,20561E-07
12,262	4,23592	9,68287E-08
12,6576	3,77023	1,05497E-08
13,0531	3,35159	0
13,4487	2,98037	0
13,8442	2,65399	0
14,2398	2,36842	0
14,6353	2,11921	0
15,0309	1,9018	0
15,4264	1,71199	0
15,822	1,54602	0
16,2175	1,40057	0
16,6131	1,27277	0

17,0086	1,16016	0
17,4042	1,06063	0
17,7997	0,972402	0
18,1953	0,893944	0
18,5908	0,823964	0
18,9864	0,761359	0
19,3819	0,705187	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	0,459004	kg/s
Temperature after atmospheric expansion	6,73324	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	300	m/s
Rainout fraction time averaged	0	fraction

OUTPUT DATA

Flame emissive power	79,3183	kW/m2
Fraction of emissivity	0,0941911	fraction
Jet velocity	300	m/s
Flame length	10,8881	m
Frustum length	9,10884	m

Frustum base width	0,374453	m
Frustum tip width	1,39983	m
Frustum lift-off distance	1,79236	m
Flame length in still air	11,9029	m
Hole to flame angle	7,59366	deg
Expanded diameter	0,0512669	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	10,7	m

OUTPUT DATA

Radiation intensity

Incident radiation [kW/m ²]	Lethality [%]	View factor	Probability	Dose [(W/m ²) ^{ProbitN.s}]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m ²]
3	0	0,0378223	-1,38321	865.119	6,56776	6,56961	7,36568	13,9334	135,552
5	0,000174704	0,0630371	0,360367	1.709.491	5,3099	4,51266	7,18644	12,4963	75,2781
7	0,02405	0,088252	1,50883	2.677.313	4,40274	3,21825	6,85136	11,2541	44,5135
12,5	6,52536	0,157593	3,48789	5.800.162	1,83527	0,950129	7,6849	9,52017	5,47814
37,5	98,7381	0,472779	7,23773	25.094.924	Not reached	Not reached		n/a	n/a

Radiation v Distance Results

INPUT DATA

Maximum distance	21,6426	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	10,7	m

OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m ²]	Lethality level [fraction]
0	1,82861	0
0,441687	2,41084	0
0,883373	3,15463	0
1,32506	3,93986	2,48242E-08
1,76675	4,73573	7,01022E-07
2,20843	5,898	2,29356E-05
2,65012	7,36571	0,000454438
3,09181	8,53577	0,00244551
3,53349	9,45522	0,00685157
3,97518	10,1951	0,0136295
4,41687	10,8231	0,0225469
4,85855	11,373	0,0332818
5,30024	11,8569	0,045286
5,74193	12,2917	0,0582685
6,18361	12,6745	0,0714899
6,6253	13,0068	0,0843401
7,06699	13,2813	0,0959178
7,50867	13,4809	0,104874
7,95036	13,5865	0,109795
8,39205	13,562	0,108643
8,83373	13,3546	0,0991563
9,27542	12,894	0,0798355
9,71711	12,0973	0,0522019

10,1588	10,907	0,0239968
10,6005	9,34765	0,0061398
11,0422	7,56228	0,000624554
11,4839	6,68803	0,000132807
11,9255	5,98428	2,83468E-05
12,3672	5,2147	3,46334E-06
12,8089	4,49788	2,85826E-07
13,2506	3,84092	1,51802E-08
13,6923	3,27278	0
14,134	2,79249	0
14,5757	2,3911	0
15,0173	2,05732	0
15,459	1,77979	0
15,9007	1,54854	0
16,3424	1,35509	0
16,7841	1,19286	0
17,2258	1,05534	0
17,6675	0,938492	0
18,1092	0,83866	0
18,5508	0,752895	0
18,9925	0,678824	0
19,4342	0,614517	0
19,8759	0,558425	0
20,3176	0,509262	0
20,7593	0,465981	0
21,201	0,427718	0
21,6426	0,393754	0

