

	PROGETTISTA  Tecnologia Ricerca Rischi	COMMESSA NQ/R21300/L01	UNITA' -
	LOCALITA' PORTO TORRES (SS) (SARDEGNA)	001-CI-E-60001	
	PROGETTO / IMPIANTO FSRU Porto Torres e Opere Connesse	Allegato C.4.2_1	Rev. 00

Rif. TRR: 72556

FSRU di PORTO TORRES e OPERE CONNESSE

Rapporto Preliminare di Sicurezza ai sensi del D.Lgs. 105/15

ALLEGATO C.4.2_1

ELABORATI DI CALCOLO 8R

0	Emissione per permessi	A.VISIGOTI	V.ROMANO	G.ROMANO	AGOSTO 2024
Rev.	Descrizione	Elaborato	Verificato	Approvato	Data

Input Report

Workspace: 2FSRURegas-8R

FSRU in rigassificazione

Study

2FSRURegas-8R

Tab	Group	Field	Value
Context of calculations	Selection of context	Weathers to use for this study	Weather folder
		Parameters to use for this study	Parameter set
		Obstructions to use for this study	
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Default terrain
		Type of pool substrate and bunds	No bund
Toxic parameters	Indoor toxic calculations	Specify the downwind building type Building type (downwind building type)	Unselected

8R Linee mandata pompe LNG Feed e collettore GNL

Pressure vessel

2FSRURegas-8R\FSRU in rigassificazione

Tab	Group	Field	Value	Units
Material	Material	Material	GAS NATURALE	
		Specify volume inventory?	Yes	
		Mass inventory	9412,32	kg
		Volume inventory	20,7	m3
		Material to track	GAS NATURALE	
	Phase	Specified condition	Pressure/temperature	
		Temperature	-160	degC
		Pressure (gauge)	14,5	bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	1	m
		Tank head	0	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
Discharge parameters	Model settings	Atmospheric expansion method	DNV recommended	
		Phase change upstream of orifice?	Disallow liquid phase change only (metastable liquid)	
	Droplet break-up mechanism	Droplet break-up mechanism - instantaneous	Use flashing correlation	
		Droplet break-up mechanism - continuous	Do not force correlation	
Short pipe	Pipe	Pipe roughness	0,045	mm

	characteristics			
	Frequencies	Frequency of bends in pipe	0	/m
		Frequency of couplings in pipe	0	/m
		Frequency of junctions in pipe	0	/m
	Frequencies of valves	Frequency of excess flow valves	0	/m
		Frequency of non-return valves	0	/m
		Frequency of shut-off valves	0	/m
	Velocity head losses	Excess flow valve velocity head losses	0	
		Non-return valve velocity head losses	0	
		Shut-off valve velocity head losses	0	
Time varying releases	Modelling of time-varying leaks and line ruptures	Vacuum relief valve	Operating	
		Vacuum relief valve set point	0	bar
	Inventory data for time-varying releases	Tank volume	20,7	m ³
		Tank vapour volume	0	m ³
		Tank liquid volume	20,7	m ³
		Tank liquid level	0	m
		Maximum vapour release height	0	m

		Minimum mass inventory	0,1	kg
		Maximum mass inventory	1E+09	kg
	Safety system modelling for time-varying releases	Safety system modelling (isolation and blowdown)	No	
Dispersion	User-defined dispersion scope (N.B Based on the material to track)	Concentrations of interest		ppm
		Distances of interest		m
		Averaging time for concentrations and distances of interest		
		Specify user-defined averaging time	No	
		User defined averaging time		s
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Default terrain	
		Type of pool substrate and bunds	No bund	
	Building definition	Release building		
		In-building release?	Outdoor	
		Building wake effect	None	
		Wind or release angle from North	0	deg
		Handling of	Trapped	

		droplets		
		Indoor mass modification factor	3	
Explosion parameters	Explosion method (Consequence calculations only)	Explosion method	Multi-Energy: Uniform confined	
	Ignition	Supply late ignition location	No ignition location	
		Location of late ignition		m
	Vapour liquid method	Use explosion mass modification factor	Yes	
		Explosion mass modification factor	3	
Fireball	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	3	
		Intensity levels	4; 12,5; 37,5	kW/m2
		Probit levels	2,73; 3,72; 7,5	
		Dose levels	1,27E+06; 5,8E+06; 2,51E+07	
		Lethality levels	0,01; 0,1; 0,99	fraction
	Parameters	Mass modification factor	3	
		Fireball maximum exposure duration	20	s
	Calculation method	Fireball model	Martinsen time varying	
		TNO model flame temperature	1726,85	degC
Jet fire	Jet fire method	Selection for jet fire method	Automatic selection / DNV recommended	

	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	5	
		Intensity levels	3; 5; 7; 12,5; 37,5	kW/m2
		Probit levels	2,73; 3,72; 7,5	
		Dose levels	1,27E+06; 5,8E+06; 2,51E+07	
		Lethality levels	0,01; 0,1; 0,99	fraction
	Parameters	Rate modification factor	3	
		Jet fire maximum exposure duration	20	s
	Cone model data	Horizontal options	Use standard method	
		Correlation	Recommended	
		Flame-shape adjustment if grounded	Yes	
	Surface emissive power	Calculation method for surface emissive power	Calculate SEP	
		Flame emissive power		kW/m2
		Emissivity fraction		fraction
Pool fire	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	5	
		Intensity levels	3; 5; 7; 12,5; 37,5	kW/m2
		Probit levels	2,73; 3,72; 7,5	
		Dose levels	1,27E+06; 5,8E+06; 2,51E+07	



		Lethality levels	0,01; 0,1; 0,99	fraction
	Parameters	Radiative fraction for general fires	0,4	fraction
		Pool fire maximum exposure duration	20	s
Geometry	Geometry	East	0	m
		North	0	m

50mm

Leak

2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe LNG Feed e collettore GNL

Tab	Group	Field	Value	Units
Scenario	Hole	Orifice diameter	50	mm
		Use specified discharge coefficient?	Yes	
		Discharge coefficient	0,62	fraction
	Release location	Elevation	17	m
		Tank head	0	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
Material	Material	Material characteristics	Flammable only	
		Material to track	GAS NATURALE	
		Type of risk effects to model	Flammable only	
	Phase	Phase to be released	Liquid	
Discharge parameters	Model settings	Atmospheric expansion method	DNV recommended	
		Phase change upstream of orifice?	Disallow liquid phase change only (metastable liquid)	
	Droplet break-up mechanism	Droplet break-up mechanism - continuous	Do not force correlation	
Dispersion	User-defined dispersion scope (N.B Based on the material to track)	Concentrations of interest		ppm
		Distances of interest		m

		Averaging time for concentrations and distances of interest		
		Specify user-defined averaging time	No	
		User defined averaging time		s
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Default terrain	
		Type of pool substrate and bunds	No bund	
Explosion parameters	Explosion method	Explosion method	Multi-Energy: Uniform confined	
	Ignition	Supply late ignition location	No ignition location	
		Location of late ignition		m
	Vapour liquid method	Use explosion mass modification factor	Yes	
		Explosion mass modification factor	3	
Fireball	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	3	
		Intensity levels	4; 12,5; 37,5	kW/m ²
		Probit levels	2,73; 3,72; 7,5	
		Dose levels	1,27E+06; 5,8E+06; 2,51E+07	
		Lethality levels	0,01; 0,1; 0,99	fraction
	Parameters	Mass modification factor	3	
		Fireball maximum exposure duration	20	s
	Calculation method	Fireball model	Martinsen time varying	

		TNO model flame temperature	1726,85	degC
Jet fire	Jet fire method	Selection for jet fire method	Automatic selection / DNV recommended	
	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	5	
		Intensity levels	3; 5; 7; 12,5; 37,5	kW/m2
		Probit levels	2,73; 3,72; 7,5	
	Parameters	Dose levels	1,27E+06; 5,8E+06; 2,51E+07	
		Lethality levels	0,01; 0,1; 0,99	fraction
		Rate modification factor	3	
	Cone model data	Jet fire maximum exposure duration	20	s
		Correlation	Recommended	
		Horizontal options	Use standard method	
		Flame-shape adjustment if grounded	Yes	
	Surface emissive power	Calculation method for surface emissive power	Calculate SEP	
		Flame emissive power		kW/m2
		Emissivity fraction		fraction
Pool fire	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input	5	

		radiation levels		
		Intensity levels	3; 5; 7; 12,5; 37,5	kW/m2
		Probit levels	2,73; 3,72; 7,5	
		Dose levels	1,27E+06; 5,8E+06; 2,51E+07	
		Lethality levels	0,01; 0,1; 0,99	fraction
	Parameters	Radiative fraction for general fires	0,4	fraction
		Pool fire maximum exposure duration	20	s



Discharge Report

Workspace: 2FSRURegas-8R

Study: FSRU in rigassificazione

Equipment Item: 8R Linee mandata pompe LNG Feed e collettore GNL

2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe LNG Feed e collettore GNL

Material	GAS NATURALE	
East	0	m
North	0	m

Scenario (Leak) : 50mm

2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe LNG Feed e collettore GNL\50mm

Weather: Category 2/F

INPUT DATA

Inventory data

Mass in vessel	9412,32	kg
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Stagnation Data (upstream end for long pipe)

Initial pressure (gauge)	14,5	bar
Initial temperature	-160	degC
Fluid state	Non-saturated liquid	

Scenario data

Phase to be released	Liquid	
Tank head	0	m
Hole diameter	50	mm
Discharge coefficient	0,62	fraction

OUTPUT DATA

Mass flow rate	44,2031	kg/s
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Release duration 212,933 s

Orifice or pipe exit data (before atmospheric expansion)

Pressure	1,01325	bar
Temperature	-160,346	degC
Liquid mass fraction	1	fraction
Velocity at vena contracta (at exit for pipe releases)	79,7648	m/s
Discharge coefficient	0,62	

Final Data (after atmospheric expansion)

Temperature	-160,347	degC
Liquid mass fraction	1	fraction
Droplet diameter	24,762	um
Expanded diameter	0,03937	m
Velocity	79,7648	m/s



Weather: Category 5/D

INPUT DATA

Inventory data

Mass in vessel	9412,32	kg
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Stagnation Data (upstream end for long pipe)

Initial pressure (gauge)	14,5	bar
Initial temperature	-160	degC
Fluid state	Non-saturated liquid	

Scenario data

Phase to be released	Liquid	
Tank head	0	m
Hole diameter	50	mm
Discharge coefficient	0,62	fraction

OUTPUT DATA

Mass flow rate	44,2031	kg/s
Release duration	212,933	s

Orifice or pipe exit data (before atmospheric expansion)

Pressure	1,01325	bar
Temperature	-160,346	degC
Liquid mass fraction	1	fraction
Velocity at vena contracta (at exit for pipe releases)	79,7648	m/s
Discharge coefficient	0,62	

Final Data (after atmospheric expansion)

Temperature	-160,347	degC
Liquid mass fraction	1	fraction
Droplet diameter	24,762	um
Expanded diameter	0,03937	m



Velocity	79,7648	m/s
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Dispersion Report

Workspace: 2FSRURegas-8R

Study: FSRU in rigassificazione

Equipment Item: 8R Linee mandata pompe LNG Feed e collettore GNL

2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe LNG Feed e collettore GNL

Material	GAS NATURALE	
East	0	m
North	0	m

Scenario (Leak) : 50mm

2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe LNG Feed e collettore GNL\50mm

Material to track	GAS NATURALE
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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
Mixing layer height [m]	100

Observer Release Data and Observer Mass Data

Observer number	Release type	Start time [s]	Start downwind distance [m]	Unit	Masses or mass rates		
					Release	Rainout	Final
1	Continuous	0	0	kg/s	44,2031	0	44,2031



2	Continuous	212,933	0	kg/s	44,2031	0	44,2031
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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
Mixing layer height [m]	800

Observer Release Data and Observer Mass Data

Observer number	Release type	Start time [s]	Start downwind distance [m]	Unit	Masses or mass rates		
					Release	Rainout	Final
1	Continuous	0	0	kg/s	44,2031	0	44,2031
2	Continuous	212,933	0	kg/s	44,2031	0	44,2031



Jet Fire

Workspace: 2FSRURegas-8R

Study: FSRU in rigassificazione

Equipment Item: 8R Linee mandata pompe LNG Feed e collettore GNL

2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe LNG Feed e collettore GNL

Material	GAS NATURALE	
East	0	m
North	0	m

Scenario (Leak) : 50mm

2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe LNG Feed e collettore GNL\50mm

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	17	m
Release angle from horizontal	0	deg

Jet fire method

Selection for jet fire method	Automatic selection / DNV recommended
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Jet Fire Parameters



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	

Automatic selection of method

Jet fire method used in calculations	Cone model
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Calculated inputs

Mass flow rate	44,2031	kg/s
Temperature after atmospheric expansion	-160,347	degC
Liquid fraction	1	fraction
Velocity after atmospheric expansion (input)	79,7648	m/s
Rainout fraction time averaged	0	fraction

OUTPUT DATA

Flame emissive power	104,93	kW/m ²
Fraction of emissivity	0,272303	fraction
Jet velocity	79,7648	m/s
Flame length	89,8604	m
Frustum length	88,5125	m
Frustum base width	1,6478	m
Frustum tip width	32,5277	m
Frustum lift-off distance	1,34791	m
Flame length in still air	80,8073	m
Hole to flame angle	0	deg
Expanded diameter	0,03937	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]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m ²]
3	0	0,0285904	-1,38321	865.119	91,434	100,525	73,2721	164,706	28875,5
5	0,000174704	0,0476506	0,360367	1.709.491	76,9043	78,6484	69,4955	146,4	19001,6
7	0,02405	0,0667108	1,50883	2.677.313	68,1583	66,3382	68,0005	136,159	14204,7
12,5	6,52536	0,119127	3,48789	5.800.162	57,0194	48,5055	64,0007	121,02	8688,88
37,5	98,7381	0,35738	7,23773	25.094.924	32,2893	20,8697	65,6857	97,975	2117,02

Radiation v Distance Results

INPUT DATA

Maximum distance	179,721	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	1,7	m

OUTPUT DATA

Downwind distance [m]	Maximum incident	Lethality level [fraction]
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	radiation [kW/m2]	
0	7,10146	0,00028871
3,66777	9,75509	0,00917737
7,33555	12,8053	0,0763947
11,0033	16,0559	0,255397
14,6711	19,4174	0,496501
18,3389	22,8508	0,707795
22,0066	26,3391	0,848936
25,6744	29,8822	0,928219
29,3422	33,4756	0,967861
33,01	37,1139	0,986182
36,6777	40,8071	0,994235
40,3455	44,5571	0,997645
44,0133	48,3695	0,999053
47,681	52,3789	0,999635
51,3488	56,2203	0,999853
55,0166	60,2846	0,999943
58,6844	64,4659	0,999978
62,3521	68,7947	0,999992
66,0199	73,314	0,999997
69,6877	78,0935	0,999999
73,3555	82,9782	1
77,0232	88,3813	1
80,691	94,2664	1
84,3588	104,93	1
88,0265	104,93	1
91,6943	67,2248	0,999988
95,3621	44,1543	0,997407
99,0299	35,2831	0,978808
102,698	29,0332	0,91376
106,365	24,2058	0,771438
110,033	20,3295	0,558794
113,701	17,1797	0,3348
117,369	14,6042	0,163276
121,037	12,4908	0,0649356



124,704	10,7501	0,0213375
128,372	9,30983	0,00590377
132,04	8,11253	0,00140542
135,708	7,11155	0,000293923
139,375	6,26967	5,50525E-05
143,043	5,55789	9,41123E-06
146,711	4,95227	1,49036E-06
150,379	4,43412	2,21744E-07
154,046	3,98828	3,13573E-08
157,714	3,60259	0
161,382	3,26722	0
165,05	2,97417	0
168,718	2,71691	0
172,385	2,49006	0
176,053	2,28919	0
179,721	2,11061	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	17	m
Release angle from horizontal	0	deg

Jet fire method

Selection for jet fire method	Automatic selection / DNV recommended
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Jet Fire Parameters

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	

Automatic selection of method

Jet fire method used in calculations	Cone model
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Calculated inputs

Mass flow rate	44,2031	kg/s
Temperature after atmospheric expansion	-160,347	degC
Liquid fraction	1	fraction
Velocity after atmospheric expansion (input)	79,7648	m/s

Rainout fraction time averaged	0	fraction
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OUTPUT DATA

Flame emissive power	138,727	kW/m2
Fraction of emissivity	0,272303	fraction
Jet velocity	79,7648	m/s
Flame length	69,851	m
Frustum length	68,8032	m
Frustum base width	2,57894	m
Frustum tip width	29,8528	m
Frustum lift-off distance	1,04776	m
Flame length in still air	80,8073	m
Hole to flame angle	0	deg
Expanded diameter	0,03937	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	Probability	Dose [(W/m2)^ProbabilityN.s]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m2]
3	0	0,0216252	-1,38321	865.119	89,2148	99,9854	60,1154	149,33	28023,6



5	0,00017 4704	0,0360 419	0,360 367	1.709.491	73,84 48	77,67 38	56,4449	130,29	1801 9,6
7	0,02405	0,0504 587	1,508 83	2.677.313	65,27 82	66,06 5	54,4091	119,687	1354 8,5
12,5	6,52536	0,0901 048	3,487 89	5.800.162	52,02 73	49,12 64	52,0972	104,125	8029, 65
37,5	98,7381	0,2703 14	7,237 73	25.094.924	30,75 07	23,73 46	49,1457	79,8963	2292, 9

Radiation v Distance Results

INPUT DATA

Maximum distance	149,33	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	12,4219	0,0625779
3,04756	16,071	0,256431
6,09511	20,1366	0,545926
9,14267	24,3586	0,777883
12,1902	28,6446	0,906295
15,2378	32,9729	0,963959
18,2853	37,343	0,986906
21,3329	41,7584	0,995404
24,3805	46,2248	0,99842
27,428	50,747	0,999463
30,4756	55,3282	0,999818
33,5231	59,9759	0,999939
36,5707	57,6708	0,999895
39,6182	70,7941	0,999995
42,6658	74,394	0,999998
45,7133	79,3991	0,999999



48,7609	84,5323	1
51,8085	89,8142	1
54,856	95,3104	1
57,9036	103,373	1
60,9511	105,803	1
63,9987	110,361	1
67,0462	120,186	1
70,0938	75,0695	0,999998
73,1414	51,9775	0,999599
76,1889	44,7505	0,997752
79,2365	38,2281	0,989371
82,284	33,4579	0,967731
85,3316	28,9411	0,912042
88,3791	25,0603	0,805656
91,4267	21,7497	0,647429
94,4742	18,9295	0,461903
97,5218	16,5322	0,288481
100,569	14,4949	0,157036
103,617	12,7619	0,0747466
106,664	11,2847	0,0313564
109,712	10,0222	0,01172
112,76	8,93933	0,00394836
115,807	8,00669	0,00121259
118,855	7,20091	0,000343716
121,902	6,50145	9,08158E-05
124,95	5,8917	2,25788E-05
127,997	5,35812	5,32974E-06
131,045	4,88922	1,20343E-06
134,092	4,47556	2,61695E-07
137,14	4,10924	5,51346E-08
140,188	3,78364	1,13132E-08
143,235	3,49324	0
146,283	3,23334	0
149,33	3	0



Explosion Report

Workspace: 2FSRURegas-8R

Study: FSRU in rigassificazione

Equipment Item: 8R Linee mandata pompe LNG Feed e collettore GNL

2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe LNG Feed e collettore GNL

Material	GAS NATURALE	
East	0	m
North	0	m

Scenario (Leak) : 50mm

2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe LNG Feed e collettore GNL\50mm

Weather: Category 2/F

Explosion location criterion	Cloud front (LFL fraction)	
Explosion height criterion	Effect height	
Explosion method	Multi-Energy: Uniform confined	
Uniform confined method explosion efficiency	12,5	%
Uniform confined method explosion strength	4	

Time of explosion [s]	Distance to centre of mass [m]	Distance to explosion centre [m]	Distance to ignition point [m]	Flammable mass [kg]	Overpressures (input) [bar]	Distance to specified overpressures [m]
0,959017	15,6687	10	10	11,6824	0,03	30,1588
					0,07	18,6435
					0,14	0
					0,3	0
					0,6	0
0,959017	15,6687	20	20	11,6824	0,03	40,1588



					0,07	28,6435
					0,14	0
					0,3	0
					0,6	0
0,959017	15,6687	30	30	11,6824	0,03	50,1588
					0,07	38,6435
					0,14	0
					0,3	0
					0,6	0
1,67391	20,8109	40	40	30,7197	0,03	67,8245
					0,07	51,9303
					0,14	0
					0,3	0
					0,6	0
2,61951	27,6128	50	50	55,901	0,03	83,9699
					0,07	64,5653
					0,14	0
					0,3	0
					0,6	0
4,33646	34,0327	60	60	89,5198	0,03	99,7431
					0,07	77,0406
					0,14	0
					0,3	0
					0,6	0
6,28484	40,3381	70	70	125,67	0,03	114,501
					0,07	89,0805
					0,14	0
					0,3	0
					0,6	0
10,282	41,9191	80	80	133,932	0,03	125,455
					0,07	99,4898
					0,14	0
					0,3	0
					0,6	0
16,3745	42,671	90	90	137,455	0,03	135,85
					0,07	109,659
					0,14	0
					0,3	0
					0,6	0
36,5117	42,6777	100	100	137,387	0,03	145,843



					0,07		119,656
					0,14		0
					0,3		0
					0,6		0

Weather: Category 5/D

Explosion location criterion	Cloud front (LFL fraction)	
Explosion height criterion	Effect height	
Explosion method	Multi-Energy: Uniform confined	
Uniform confined method explosion efficiency	12,5	%
Uniform confined method explosion strength	4	

Time of explosion [s]	Distance to centre of mass [m]	Distance to explosion centre [m]	Distance to ignition point [m]	Flammable mass [kg]	Overpressures (input) [bar]	Distance to specified overpressures [m]
0,956531	16,6784	10	10	14,6453	0,03	31,7364
					0,07	19,3199
					0,14	0
					0,3	0
					0,6	0
0,956531	16,6784	20	20	14,6453	0,03	41,7364
					0,07	29,3199
					0,14	0
					0,3	0
					0,6	0
1,12119	17,8082	30	30	18,6324	0,03	53,5529
					0,07	40,0988
					0,14	0
					0,3	0
					0,6	0
2,06559	24,2883	40	40	41,5007	0,03	70,7591
					0,07	53,1886
					0,14	0
					0,3	0
					0,6	0
3,20222	29,8487	50	50	61,173	0,03	85,0059
					0,07	65,0095
					0,14	0
					0,3	0



					0,6	0
5,14419	31,5566	60	60	67,4561	0,03	96,1656
					0,07	75,5067
					0,14	0
					0,3	0
					0,6	0
8,65312	32,7347	70	70	71,7813	0,03	106,923
					0,07	85,8313
					0,14	0
					0,3	0
					0,6	0

