Input Report

Workspace: RNM LANDIM_ACL_Rev_2

3600 s

Study
RNM LANDIM_ACL_Rev_Jul2024

Tab	Group	Field	Value
Context of calculations	Selection of context	Weathers to use for this study	Weather folder
		Parameters to use for this study	3600s
Material	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land
		Type of pool substrate and bunds	Concrete, no bund
Toxic parameters	Indoor toxic calculations	Specify the downwind building type	Unselected
		Building type (downwind building type)	Buildings\Building type

9_Rotura Catastrófica TK.3.233.1 com etanol

Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	ETHANOL	
		Specify volume inventory?	No	
		Mass inventory	79220	kg
		Volume inventory	100,803	m3
		Material to track	ETHANOL	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature	25	degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	0,1	m
		Tank head	10	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 characteristics	Pipe roughness	0,045	mm
	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	100,803	m3

		Tank vapour volume	0	m3
		Tank liquid volume	100,803	m3
		Tank liquid level	0	m
		Maximum vapour release height		m
		Minimum mass inventory	0,1	kg
		Maximum mass inventory	1E+09	kg
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	Land	
		Type of pool substrate and bunds	Parque Tanques - Bacia 3	
	Building definition	Release building		
		In-building release?	Outdoor	
		Building wake effect	Roof/lee	

		Wind or release angle from North	0	deg
		Handling of droplets	Trapped	
		Indoor mass modification factor	3	
Explosion parameters	Explosion method (Consequence calculations only)	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of confined sources	Use volumes	
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction

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	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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

Catastrophic rupture

Catastrophic rupture
RNM LANDIM_ACL_Rev_Jul2024\3600 s\9_Rotura Catastrófica
TK.3.233.1 com etanol

Tab	Group	Field	Value	Units
Scenario	Release location	Elevation	0,1	m
		Tank head	10	m
	Fireball emissive power	Use vessel burst pressure	No	
		Vessel burst pressure - gauge		bar
Material	Material	Material characteristics	Flammable only	
		Material to track	ETHANOL	
Discharge parameters	Droplet break-up mechanism	Droplet break-up mechanism - instantaneous	Use flashing 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	Land	
		Type of pool	Parque	

		substrate and bunds	Tanques - Bacia 3	
Explosion parameters	Explosion method	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of confined sources	Use volumes	
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction
Fireball	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	5	
		Intensity levels	37,5; 12,5; 7; 5; 3	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
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	37,5; 12,5; 7; 5; 3	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

10_Rotura 100mm TK.3.233.1 com etanol

Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	ETHANOL	
		Specify volume inventory?	No	
		Mass inventory	79220	kg
		Volume inventory	100,803	m3
		Material to track	ETHANOL	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature	25	degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	0,1	m
		Tank head	10	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	Droplet break-up	Use flashing	

	mechanism	mechanism - instantaneous	correlation	
		Droplet break-up mechanism - continuous	Do not force correlation	
Short pipe	Pipe characteristics	Pipe roughness	0,045	mm
	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	100,803	m3
		Tank vapour	0	m3

		volume		
		Tank liquid volume	100,803	m3
		Tank liquid level	0	m
		Maximum vapour release height		m
		Minimum mass inventory	0,1	kg
		Maximum mass inventory	1E+09	kg
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	Land	
		Type of pool substrate and bunds	Parque Tanques - Bacia 3	
	Building definition	Release building		
		In-building release?	Outdoor	
		Building wake effect	Roof/lee	

		Wind or release angle from North	0	deg
		Handling of droplets	Trapped	
		Indoor mass modification factor	3	
Explosion parameters	Explosion method (Consequence calculations only)	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of confined sources	Use volumes	
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction

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	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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

Leak

Leak
RNM LANDIM_ACL_Rev_Jul2024\3600 s\10_Rotura 100mm TK.3.233.1 com etanol

Tab	Group	Field	Value	Units
Scenario	Hole	Orifice diameter	100	mm
		Use specified discharge coefficient?	No	
		Discharge coefficient		fraction
	Release location	Elevation	0,1	m
		Tank head	10	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
Material	Material	Material characteristics	Flammable only	
		Material to track	ETHANOL	
	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	Concentrations of interest		ppm

	track)			
		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	Land	
		Type of pool substrate and bunds	Parque Tanques - Bacia 3	
Explosion parameters	Explosion method	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of	Use volumes	

		confined sources		
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction
Fireball	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	5	
		Intensity levels	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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	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 radiation levels	5	
		Intensity levels	37,5; 12,5; 7; 5; 3	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	0,4	fraction

		for general fires		
		Pool fire maximum exposure duration	20	s

11_Rotura 10mm TK.3.233.1 com etanol

Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	ETHANOL	
		Specify volume inventory?	No	
		Mass inventory	79220	kg
		Volume inventory	100,803	m3
		Material to track	ETHANOL	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature	25	degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	0,1	m
		Tank head	10	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	Droplet break-up	Use flashing	

	mechanism	mechanism - instantaneous	correlation	
		Droplet break-up mechanism - continuous	Do not force correlation	
Short pipe	Pipe characteristics	Pipe roughness	0,045	mm
	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	100,803	m3
		Tank vapour	0	m3

		volume		
		Tank liquid volume	100,803	m3
		Tank liquid level	0	m
		Maximum vapour release height		m
		Minimum mass inventory	0,1	kg
		Maximum mass inventory	1E+09	kg
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	Land	
		Type of pool substrate and bunds	Parque Tanques - Bacia 3	
	Building definition	Release building		
		In-building release?	Outdoor	
		Building wake effect	Roof/lee	

		Wind or release angle from North	0	deg
		Handling of droplets	Trapped	
		Indoor mass modification factor	3	
Explosion parameters	Explosion method (Consequence calculations only)	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of confined sources	Use volumes	
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction

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	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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

Leak

Leak
RNM LANDIM_ACL_Rev_Jul2024\3600 s\11_Rotura 10mm TK.3.233.1 com etanol

Tab	Group	Field	Value	Units
Scenario	Hole	Orifice diameter	10	mm
		Use specified discharge coefficient?	No	
		Discharge coefficient		fraction
	Release location	Elevation	0,1	m
		Tank head	10	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
Material	Material	Material characteristics	Flammable only	
		Material to track	ETHANOL	
	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	Concentrations of interest		ppm

	track)			
		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	Land	
		Type of pool substrate and bunds	Parque Tanques - Bacia 3	
Explosion parameters	Explosion method	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of	Use volumes	

		confined sources		
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction
Fireball	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	5	
		Intensity levels	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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	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 radiation levels	5	
		Intensity levels	37,5; 12,5; 7; 5; 3	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	0,4	fraction

		for general fires		
		Pool fire maximum exposure duration	20	s

12_Rotura Catastrófica TK.3.249.1 com isohexano

Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	ISO-HEXANE	
		Specify volume inventory?	No	
		Mass inventory	40500	kg
		Volume inventory	61,7367	m3
		Material to track	ISO-HEXANE	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature	25	degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	0,1	m
		Tank head	10	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 characteristics	Pipe roughness	0,045	mm
	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	61,7367	m3

		Tank vapour volume	0	m3
		Tank liquid volume	61,7367	m3
		Tank liquid level	0	m
		Maximum vapour release height		m
		Minimum mass inventory	0	kg
		Maximum mass inventory	1E+09	kg
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	Land	
		Type of pool substrate and bunds	Parque Tanques - Bacia 3	
	Building definition	Release building		
		In-building release?	Outdoor	
		Building wake effect	Roof/lee	

		Wind or release angle from North	0	deg
		Handling of droplets	Trapped	
		Indoor mass modification factor	3	
Explosion parameters	Explosion method (Consequence calculations only)	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of confined sources	Use volumes	
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction

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	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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

Catastrophic rupture

Catastrophic rupture
RNM LANDIM_ACL_Rev_Jul2024\3600 s\12_Rotura Catastrófica
TK.3.249.1 com isohexano

Tab	Group	Field	Value	Units
Scenario	Release location	Elevation	0,1	m
		Tank head	8,82	m
	Fireball emissive power	Use vessel burst pressure	No	
		Vessel burst pressure - gauge		bar
Material	Material	Material characteristics	Flammable only	
		Material to track	ISO-HEXANE	
Discharge parameters	Droplet break-up mechanism	Droplet break-up mechanism - instantaneous	Use flashing 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	Land	
		Type of pool	Parque	

		substrate and bunds	Tanques - Bacia 3	
Explosion parameters	Explosion method	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of confined sources	Use volumes	
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction
Fireball	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	5	
		Intensity levels	37,5; 12,5; 7; 5; 3	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
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	37,5; 12,5; 7; 5; 3	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

13_Rotura 100mm TK.3.249.1 com isohexano

Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	ISO-HEXANE	
		Specify volume inventory?	No	
		Mass inventory	40500	kg
		Volume inventory	61,7367	m3
		Material to track	ISO-HEXANE	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature	25	degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	0,1	m
		Tank head	10	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	Droplet break-up	Use flashing	

	mechanism	mechanism - instantaneous	correlation	
		Droplet break-up mechanism - continuous	Do not force correlation	
Short pipe	Pipe characteristics	Pipe roughness	0,045	mm
	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	61,7367	m3
		Tank vapour	0	m3

		volume		
		Tank liquid volume	61,7367	m3
		Tank liquid level	0	m
		Maximum vapour release height		m
		Minimum mass inventory	0	kg
		Maximum mass inventory	1E+09	kg
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	Land	
		Type of pool substrate and bunds	Parque Tanques - Bacia 3	
	Building definition	Release building		
		In-building release?	Outdoor	
		Building wake effect	Roof/lee	

		Wind or release angle from North	0	deg
		Handling of droplets	Trapped	
		Indoor mass modification factor	3	
Explosion parameters	Explosion method (Consequence calculations only)	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of confined sources	Use volumes	
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction

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	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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

Leak

Leak
RNM LANDIM_ACL_Rev_Jul2024\3600 s\13_Rotura 100mm TK.3.249.1 com isohexano

Tab	Group	Field	Value	Units
Scenario	Hole	Orifice diameter	100	mm
		Use specified discharge coefficient?	Yes	
		Discharge coefficient	0,62	fraction
	Release location	Elevation	0,1	m
		Tank head	10	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
Material	Material	Material characteristics	Flammable only	
		Material to track	ISO-HEXANE	
	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	Concentrations of interest		ppm

	track)			
		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	Land	
		Type of pool substrate and bunds	Parque Tanques - Bacia 3	
Explosion parameters	Explosion method	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of	Use volumes	

		confined sources		
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction
Fireball	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	5	
		Intensity levels	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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	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 radiation levels	5	
		Intensity levels	37,5; 12,5; 7; 5; 3	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	0,4	fraction

		for general fires		
		Pool fire maximum exposure duration	20	s

14_Rotura 10mm TK.3.249.1 com isohexano

Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	ISO-HEXANE	
		Specify volume inventory?	No	
		Mass inventory	40500	kg
		Volume inventory	61,7367	m3
		Material to track	ISO-HEXANE	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature	25	degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	0,1	m
		Tank head	10	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	Droplet break-up	Use flashing	

	mechanism	mechanism - instantaneous	correlation	
		Droplet break-up mechanism - continuous	Do not force correlation	
Short pipe	Pipe characteristics	Pipe roughness	0,045	mm
	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	61,7367	m3
		Tank vapour	0	m3

		volume		
		Tank liquid volume	61,7367	m3
		Tank liquid level	0	m
		Maximum vapour release height		m
		Minimum mass inventory	0	kg
		Maximum mass inventory	1E+09	kg
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	Land	
		Type of pool substrate and bunds	Parque Tanques - Bacia 3	
	Building definition	Release building		
		In-building release?	Outdoor	
		Building wake effect	Roof/lee	

		Wind or release angle from North	0	deg
		Handling of droplets	Trapped	
		Indoor mass modification factor	3	
Explosion parameters	Explosion method (Consequence calculations only)	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of confined sources	Use volumes	
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction

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	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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

Leak

Leak
RNM LANDIM_ACL_Rev_Jul2024\3600 s\14_Rotura 10mm TK.3.249.1 com isohexano

Tab	Group	Field	Value	Units
Scenario	Hole	Orifice diameter	10	mm
		Use specified discharge coefficient?	Yes	
		Discharge coefficient	0,62	fraction
	Release location	Elevation	0,1	m
		Tank head	10	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
Material	Material	Material characteristics	Flammable only	
		Material to track	ISO-HEXANE	
	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	Concentrations of interest		ppm

	track)			
		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	Land	
		Type of pool substrate and bunds	Parque Tanques - Bacia 3	
Explosion parameters	Explosion method	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of	Use volumes	

		confined sources		
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction
Fireball	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	5	
		Intensity levels	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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	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 radiation levels	5	
		Intensity levels	37,5; 12,5; 7; 5; 3	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	0,4	fraction

		for general fires		
		Pool fire maximum exposure duration	20	s

61_Warehouse

Warehouse
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Warehouse materials	Warehouse materials	Warehouse material	WAREHOUSE RNM	
		Stored mass	1,954E+06	kg
		Active mass fraction	0,414	fraction
		Warehouse material validation	Warehouse material selection is valid	
Building	Building	Warehouse building	Buildings\Building type\Armazém Automático	
	Building wake effect	Building wake effect	Roof/lee	
		Wind or release angle from North	0	deg
	Warehouse	Warehouse is part of a larger building	No	
		Warehouse area		m2
		Warehouse height		m
	Calculated warehouse dimensions	Calculated warehouse area	3936	m2
		Calculated warehouse volume	141696	m3
Fire scenarios	Fire scenarios	Scenario type	PGS-15 scenarios	
	ADR class 3 liquids	Storage type	(Not stored)	
		Reaction rate calculation		

		Mass fraction		fraction
		Specified reaction rate		kg/m2.s
	PGS-15 scenarios	Fire-fighting system	1.1a Automatic sprinkler system	
		Method of setting likelihood of doors being open	Manual closing	
	User-defined scenarios	Name	Doors closed - 20 m2 / 1800 s; Doors closed - 50 m2 / 1800 s; Doors closed - 100 m2 / 1800 s; Doors closed - 300 m2 / 1800 s; Doors open - 20 m2 / 1800 s; Doors open - 50 m2 / 1800 s; Doors open - 100 m2 / 1800 s; Doors open - 300 m2 / 1800 s; Doors open - 900 m2 / 1800 s	
		Fire surface area	20; 50; 100; 300; 20; 50; 100; 300; 900	m2
		Ventilation rate option	Specified; Specified; Specified; Specified; Infinite; Infinite; Infinite; Infinite; Infinite	
		Air change	4; 4; 4; 4	/hr
		Fire duration	1800; 1800; 1800; 1800; 1800; 1800; 1800; 1800; 1800	s
		Probability	0,405; 0,396; 0,09; 0,009; 0,045; 0,044; 0,01;	fraction

			0,0005; 0,0005	
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
	Standardised toxic threshold concentrations and averaging times	ERPG [1 hr]	No	
		IDLH [30 mins]	No	
		STEL [15 mins]	No	

15a_Dispersão nuvem tóxica incendio armazém automático

Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	HYDROGEN CHLORIDE	
		Specify volume inventory?	No	
		Mass inventory	383	kg
		Volume inventory		m3
		Material to track	HYDROGEN CHLORIDE	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature		degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	36	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	Disallow liquid	

		upstream of orifice?	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 characteristics	Pipe roughness	0,045	mm
	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		m3
		Tank vapour volume		m3
		Tank liquid volume		m3
		Tank liquid level		m
		Maximum vapour release height		m
		Minimum mass inventory	0,1	kg
		Maximum mass inventory		kg
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
	Standardised toxic threshold concentrations and averaging times	ERPG [1 hr]	No	
		IDLH [30 mins]	No	
		STEL [15 mins]	No	

Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	
		Type of pool substrate and bunds	Armazém automático	
	Building definition	Release building	Buildings\Building type (1)\Armazém Automático (1)	
		In-building release?	Inbuilding	
		Building wake effect	Roof/lee	
		Wind or release angle from North	0	deg
		Handling of droplets	Not trapped	
		Indoor mass modification factor	3	
Toxic parameters	Indoor toxic calculations	Specify the downwind building type	Unselected	
		Building type (downwind building type)	Buildings\Building type	
	Exposure time data	Set averaging time equal to exposure time	Use a fixed averaging time	
		Cut-off fraction of toxic load for exposure time calculation	0,05	fraction
		Cut-off concentration for exposure time calculations	0	fraction
	Toxic contours	Number of toxic levels	4	

		Dose levels [ppm^n.min]	130000; 1,3E+06; 1,3E+07; 1,3E+08	
		Probit levels	2; 3; 4; 10	
		Lethality levels	0,001; 0,01; 0,1; 0,99	fraction
Geometry	Geometry	East	15,814	m
		North	-61,179	m

User defined source_a

User defined source
RNM LANDIM_ACL_Rev_Jul2024\3600 s\15a_Dispersão nuvem tóxica incendio armazém automático

Tab	Group	Field	Value	Units
Scenario	Release scenario	Release scenario	Leak	
		The number of release observers	2	
	Release observers	Release time	0; 1800	s
		Release phase	Vapour; Vapour	
		Mass flow	0,21; 0,21	kg/s
		Final temperature	50; 50	degC
		Final velocity	3,61E-05; 3,61E-05	m/s
		Liquid fraction		fraction
		Droplet diameter		um
		Pool radius		m
		Pre-dilution air rate		kg/s
		Downstream calculation status	No errors detected	
	Release location	Elevation	36	m
		Tank head	0	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
	Fireball emissive power	Use vessel burst pressure	No	
		Vessel burst pressure - gauge		bar
	Jet fire Miller model hole size	Orifice diameter		mm

Material	Material	Material characteristics	Toxic only	
		Material to track	HYDROGEN CHLORIDE	
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
	Standardised toxic threshold concentrations and averaging times	ERPG [1 hr]	No	
		IDLH [30 mins]	No	
		STEL [15 mins]	No	
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	
		Type of pool substrate and bunds	Armazém automático	
Toxic parameters	Indoor toxic calculations	Specify the downwind building type	Unselected	
		Building type (downwind	Buildings\Building type	

		building type)		
	Exposure time data	Set averaging time equal to exposure time	Use a fixed averaging time	
		Cut-off fraction of toxic load for exposure time calculation	0,05	fraction
		Cut-off concentration for exposure time calculations	0	fraction
	Toxic contours	Number of toxic levels	4	
		Dose levels [ppm^n.min]	130000; 1,3E+06; 1,3E+07; 1,3E+08	
		Probit levels	2; 3; 4; 10	
		Lethality levels	0,001; 0,01; 0,1; 0,99	fraction

15b_Dispersão nuvem tóxica incendio armazém automático

Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	HYDROGEN CHLORIDE	
		Specify volume inventory?	No	
		Mass inventory	957	kg
		Volume inventory		m3
		Material to track	HYDROGEN CHLORIDE	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature		degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	36	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	Disallow liquid	

		upstream of orifice?	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 characteristics	Pipe roughness	0,045	mm
	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		m3
		Tank vapour volume		m3
		Tank liquid volume		m3
		Tank liquid level		m
		Maximum vapour release height		m
		Minimum mass inventory	0,1	kg
		Maximum mass inventory		kg
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
	Standardised toxic threshold concentrations and averaging times	ERPG [1 hr]	No	
		IDLH [30 mins]	No	
		STEL [15 mins]	No	

Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	
		Type of pool substrate and bunds	Armazém automático	
	Building definition	Release building	Buildings\Building type (1)\Armazém Automático (1)	
		In-building release?	Inbuilding	
		Building wake effect	Roof/lee	
		Wind or release angle from North	0	deg
		Handling of droplets	Not trapped	
		Indoor mass modification factor	3	
Toxic parameters	Indoor toxic calculations	Specify the downwind building type	Unselected	
		Building type (downwind building type)	Buildings\Building type	
	Exposure time data	Set averaging time equal to exposure time	Use a fixed averaging time	
		Cut-off fraction of toxic load for exposure time calculation	0,05	fraction
		Cut-off concentration for exposure time calculations	0	fraction
	Toxic contours	Number of toxic levels	4	

		Dose levels [ppm^n.min]	130000; 1,3E+06; 1,3E+07; 1,3E+08	
		Probit levels	2; 3; 4; 10	
		Lethality levels	0,001; 0,01; 0,1; 0,99	fraction
Geometry	Geometry	East	15,814	m
		North	-61,179	m

User defined source_b

User defined source
RNM LANDIM_ACL_Rev_Jul2024\3600 s\15b_Dispersão nuvem tóxica incendio armazém automático

Tab	Group	Field	Value	Units
Scenario	Release scenario	Release scenario	Leak	
		The number of release observers	2	
	Release observers	Release time	0; 1800	s
		Release phase	Vapour; Vapour	
		Mass flow	0,53; 0,53	kg/s
		Final temperature	50; 50	degC
		Final velocity	9,02E-05; 9,02E-05	m/s
		Liquid fraction		fraction
		Droplet diameter		um
		Pool radius		m
		Pre-dilution air rate		kg/s
		Downstream calculation status	No errors detected	
	Release location	Elevation	36	m
		Tank head	0	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
	Fireball emissive power	Use vessel burst pressure	No	
		Vessel burst pressure - gauge		bar
	Jet fire Miller model hole size	Orifice diameter		mm

Material	Material	Material characteristics	Toxic only	
		Material to track	HYDROGEN CHLORIDE	
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
	Standardised toxic threshold concentrations and averaging times	ERPG [1 hr]	No	
		IDLH [30 mins]	No	
		STEL [15 mins]	No	
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	
		Type of pool substrate and bunds	Armazém automático	
Toxic parameters	Indoor toxic calculations	Specify the downwind building type	Unselected	
		Building type (downwind	Buildings\Building type	

		building type)		
	Exposure time data	Set averaging time equal to exposure time	Use a fixed averaging time	
		Cut-off fraction of toxic load for exposure time calculation	0,05	fraction
		Cut-off concentration for exposure time calculations	0	fraction
	Toxic contours	Number of toxic levels	4	
		Dose levels [ppm^n.min]	130000; 1,3E+06; 1,3E+07; 1,3E+08	
		Probit levels	2; 3; 4; 10	
		Lethality levels	0,001; 0,01; 0,1; 0,99	fraction

15c_Dispersão nuvem tóxica incendio armazém automático

Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	HYDROGEN CHLORIDE	
		Specify volume inventory?	No	
		Mass inventory	1915	kg
		Volume inventory		m3
		Material to track	HYDROGEN CHLORIDE	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature		degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	36	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	Disallow liquid	

		upstream of orifice?	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 characteristics	Pipe roughness	0,045	mm
	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		m3
		Tank vapour volume		m3
		Tank liquid volume		m3
		Tank liquid level		m
		Maximum vapour release height		m
		Minimum mass inventory	0,1	kg
		Maximum mass inventory		kg
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
	Standardised toxic threshold concentrations and averaging times	ERPG [1 hr]	No	
		IDLH [30 mins]	No	
		STEL [15 mins]	No	

Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	
		Type of pool substrate and bunds	Armazém automático	
	Building definition	Release building	Buildings\Building type (1)\Armazém Automático (1)	
		In-building release?	Inbuilding	
		Building wake effect	Roof/lee	
		Wind or release angle from North	0	deg
		Handling of droplets	Not trapped	
		Indoor mass modification factor	3	
Toxic parameters	Indoor toxic calculations	Specify the downwind building type	Unselected	
		Building type (downwind building type)	Buildings\Building type	
	Exposure time data	Set averaging time equal to exposure time	Use a fixed averaging time	
		Cut-off fraction of toxic load for exposure time calculation	0,05	fraction
		Cut-off concentration for exposure time calculations	0	fraction
	Toxic contours	Number of toxic levels	4	

		Dose levels [ppm^n.min]	130000; 1,3E+06; 1,3E+07; 1,3E+08	
		Probit levels	2; 3; 4; 10	
		Lethality levels	0,001; 0,01; 0,1; 0,99	fraction
Geometry	Geometry	East	15,814	m
		North	-61,179	m

User defined source_c

User defined source
RNM LANDIM_ACL_Rev_Jul2024\3600 s\15c_Dispersão nuvem tóxica incendio armazém automático

Tab	Group	Field	Value	Units
Scenario	Release scenario	Release scenario	Leak	
		The number of release observers	2	
	Release observers	Release time	0; 1800	s
		Release phase	Vapour; Vapour	
		Mass flow	1,06; 1,06	kg/s
		Final temperature	50; 50	degC
		Final velocity	0,00018; 0,00018	m/s
		Liquid fraction	-9,95E+36; -9,95E+36	fraction
		Droplet diameter	-9,95E+42; -9,95E+42	um
		Pool radius	-9,95E+36; -9,95E+36	m
		Pre-dilution air rate	-9,95E+36; -9,95E+36	kg/s
		Downstream calculation status	No errors detected	
	Release location	Elevation	36	m
		Tank head	0	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
	Fireball emissive power	Use vessel burst pressure	No	
		Vessel burst		bar

		pressure - gauge		
	Jet fire Miller model hole size	Orifice diameter		mm
Material	Material	Material characteristics	Toxic only	
		Material to track	HYDROGEN CHLORIDE	
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
	Standardised toxic threshold concentrations and averaging times	ERPG [1 hr]	No	
		IDLH [30 mins]	No	
		STEL [15 mins]	No	
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	
		Type of pool substrate and bunds	Armazém automático	
Toxic parameters	Indoor toxic calculations	Specify the downwind	Unselected	

		building type		
		Building type (downwind building type)	Buildings\Building type	
	Exposure time data	Set averaging time equal to exposure time	Use a fixed averaging time	
		Cut-off fraction of toxic load for exposure time calculation	0,05	fraction
		Cut-off concentration for exposure time calculations	0	fraction
	Toxic contours	Number of toxic levels	4	
		Dose levels [ppm^n.min]	130000; 1,3E+06; 1,3E+07; 1,3E+08	
		Probit levels	2; 3; 4; 10	
		Lethality levels	0,001; 0,01; 0,1; 0,99	fraction

15d_Dispersão nuvem tóxica incendio armazém automático

Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	HYDROGEN CHLORIDE	
		Specify volume inventory?	No	
		Mass inventory	5401	kg
		Volume inventory		m3
		Material to track	HYDROGEN CHLORIDE	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature		degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	36	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	Disallow liquid	

		upstream of orifice?	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 characteristics	Pipe roughness	0,045	mm
	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		m3
		Tank vapour volume		m3
		Tank liquid volume		m3
		Tank liquid level		m
		Maximum vapour release height		m
		Minimum mass inventory	0,1	kg
		Maximum mass inventory		kg
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
	Standardised toxic threshold concentrations and averaging times	ERPG [1 hr]	No	
		IDLH [30 mins]	No	
		STEL [15 mins]	No	

Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	
		Type of pool substrate and bunds	Armazém automático	
	Building definition	Release building	Buildings\Building type (1)\Armazém Automático (1)	
		In-building release?	Inbuilding	
		Building wake effect	Roof/lee	
		Wind or release angle from North	0	deg
		Handling of droplets	Not trapped	
		Indoor mass modification factor	3	
Toxic parameters	Indoor toxic calculations	Specify the downwind building type	Unselected	
		Building type (downwind building type)	Buildings\Building type	
	Exposure time data	Set averaging time equal to exposure time	Use a fixed averaging time	
		Cut-off fraction of toxic load for exposure time calculation	0,05	fraction
		Cut-off concentration for exposure time calculations	0	fraction
	Toxic contours	Number of toxic levels	4	

		Dose levels [ppm^n.min]	130000; 1,3E+06; 1,3E+07; 1,3E+08	
		Probit levels	2; 3; 4; 10	
		Lethality levels	0,001; 0,01; 0,1; 0,99	fraction
Geometry	Geometry	East	15,814	m
		North	-61,179	m

User defined source_d

User defined source
RNM LANDIM_ACL_Rev_Jul2024\3600 s\15d_Dispersão nuvem tóxica incendio armazém automático

Tab	Group	Field	Value	Units
Scenario	Release scenario	Release scenario	Leak	
		The number of release observers	2	
	Release observers	Release time	0; 1800	s
		Release phase	Vapour; Vapour	
		Mass flow	3; 3	kg/s
		Final temperature	50; 50	degC
		Final velocity	0,000541; 0,000541	m/s
		Liquid fraction	0; 0	fraction
		Droplet diameter	0; 0	um
		Pool radius	0; 0	m
		Pre-dilution air rate	0; 0	kg/s
		Downstream calculation status	No errors detected	
	Release location	Elevation	36	m
		Tank head	0	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
	Fireball emissive power	Use vessel burst pressure	No	
		Vessel burst pressure - gauge		bar
	Jet fire Miller	Orifice diameter		mm

	model hole size			
Material	Material	Material characteristics	Toxic only	
		Material to track	HYDROGEN CHLORIDE	
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
	Standardised toxic threshold concentrations and averaging times	ERPG [1 hr]	No	
		IDLH [30 mins]	No	
		STEL [15 mins]	No	
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	
		Type of pool substrate and bunds	Armazém automático	
Toxic parameters	Indoor toxic calculations	Specify the downwind building type	Unselected	
		Building type	Buildings\Building	

		(downwind building type)	type	
	Exposure time data	Set averaging time equal to exposure time	Use a fixed averaging time	
		Cut-off fraction of toxic load for exposure time calculation	0,05	fraction
		Cut-off concentration for exposure time calculations	0	fraction
	Toxic contours	Number of toxic levels	4	
		Dose levels [ppm^n.min]	130000; 1,3E+06; 1,3E+07; 1,3E+08	
		Probit levels	2; 3; 4; 10	
		Lethality levels	0,001; 0,01; 0,1; 0,99	fraction

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Atmospheric storage tank
RNM LANDIM_ACL_Rev_Jul2024\3600 s

Tab	Group	Field	Value	Units
Material	Material	Material	OCTOATO MANGANES 10%	
		Specify volume inventory?	No	
		Mass inventory	82	kg
		Volume inventory	0,121955	m3
		Material to track	OCTOATO MANGANES 10%	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature	25	degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	0,1	m
		Tank head	1	m
	Direction	Outdoor release direction	Horizontal	
		Outdoor release angle	0	deg
Discharge parameters	Model settings	Atmospheric expansion method	DNV recommended	
		Phase change upstream of	Disallow liquid phase change	

		orifice?	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 characteristics	Pipe roughness	0,045	mm
	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	Tank volume	0,121955	m3

	for time-varying releases			
		Tank vapour volume	0	m3
		Tank liquid volume	0,121955	m3
		Tank liquid level	0	m
		Maximum vapour release height		m
		Minimum mass inventory	0,1	kg
		Maximum mass inventory	1E+09	kg
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	Land	
		Type of pool substrate and bunds	Armazém automático	
	Building definition	Release building		
		In-building release?	Outdoor	

		Building wake effect	Roof/lee	
		Wind or release angle from North	0	deg
		Handling of droplets	Trapped	
		Indoor mass modification factor	3	
Explosion parameters	Explosion method (Consequence calculations only)	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of confined sources	Use volumes	
		Strength of confined source		
		Volume of confined source		m3

		Volume fraction of confined source		fraction
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	37,5; 12,5; 7; 5; 3	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	37,5; 12,5; 7; 5; 3	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

Catastrophic rupture

Catastrophic rupture
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Tab	Group	Field	Value	Units
Scenario	Release location	Elevation	0,1	m
		Tank head	1	m
	Fireball emissive power	Use vessel burst pressure	No	
		Vessel burst pressure - gauge		bar
Material	Material	Material characteristics	Flammable only	
		Material to track	OCTOATO MANGANES 10%	
Discharge parameters	Droplet break-up mechanism	Droplet break-up mechanism - instantaneous	Use flashing 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		s

		averaging time		
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	
		Type of pool substrate and bunds	Armazém automático	
Explosion parameters	Explosion method	Explosion method	Multi-Energy: User-defined	
	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	
Multi-Energy	Multi-Energy: User-defined	Unconfined explosion strength	6	
		Unconfined explosion efficiency	100	%
	Confined explosion sources	Number of confined sources	0	
		Option for specifying size of confined sources	Use volumes	
		Strength of confined source		
		Volume of confined source		m3
		Volume fraction of confined source		fraction
Fireball	Result types to calculate	Calculate probit	No	
		Calculate dose	No	
		Calculate lethality	No	
	Radiation levels	Number of input radiation levels	5	

		Intensity levels	37,5; 12,5; 7; 5; 3	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
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	37,5; 12,5; 7; 5; 3	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

63 - Rotura de IBC com Horolith V

Atmospheric storage tank
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Tab	Group	Field	Value	Units
Material	Material	Material	HORALITH	
		Specify volume inventory?	No	
		Mass inventory	1000	kg
		Volume inventory	0,868124	m3
		Material to track	NITRIC ACID	
	Phase	Specified condition	Temperature and atmospheric pressure	
		Temperature	25	degC
		Pressure (gauge)		bar
		Fluid state	Liquid	
		Liquid mole fraction	1	fraction
	Modelling of mixtures	Multi or pseudo-component modelling	PC modelling	
Scenario	Pipe dimensions	Pipe length		m
	Release location	Elevation	0,1	m
		Tank head	1	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-	Droplet break-up	Use flashing	

	up mechanism	mechanism - instantaneous	correlation	
		Droplet break-up mechanism - continuous	Do not force correlation	
Short pipe	Pipe characteristics	Pipe roughness	0,045	mm
	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	0,868124	m3

		Tank vapour volume	0	m3
		Tank liquid volume	0,868124	m3
		Tank liquid level	0	m
		Maximum vapour release height		m
		Minimum mass inventory	0,1	kg
		Maximum mass inventory	1E+09	kg
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
	Standardised toxic threshold concentrations and averaging times	ERPG [1 hr]	No	
		IDLH [30 mins]	No	
		STEL [15 mins]	No	
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	

		Type of pool substrate and bunds	Armazém automático	
	Building definition	Release building	Buildings\Building type\Armazém Automático	
		In-building release?	Inbuilding	
		Building wake effect	Roof/lee	
		Wind or release angle from North	0	deg
		Handling of droplets	Trapped	
		Indoor mass modification factor	3	
Toxic parameters	Indoor toxic calculations	Specify the downwind building type	Unselected	
		Building type (downwind building type)	Buildings\Building type	
	Exposure time data	Set averaging time equal to exposure time	Use a fixed averaging time	
		Cut-off fraction of toxic load for exposure time calculation	0,05	fraction
		Cut-off concentration for exposure time calculations	0	fraction
	Toxic contours	Number of toxic levels	4	
		Dose levels [ppm^n.min]	130000; 1,3E+06; 1,3E+07; 1,3E+08	
		Probit levels	2; 3; 4; 10	

		Lethality levels	0,001; 0,01; 0,1; 0,99	fraction
Geometry	Geometry	East	15,814	m
		North	-61,179	m

Catastrophic rupture

Catastrophic rupture
RNM LANDIM_ACL_Rev_Jul2024\3600 s\63 - Rotura de IBC com Horolith V

Tab	Group	Field	Value	Units
Scenario	Release location	Elevation	0,1	m
		Tank head	1	m
	Fireball emissive power	Use vessel burst pressure	No	
		Vessel burst pressure - gauge		bar
Material	Material	Material characteristics	Toxic only	
		Material to track	NITRIC ACID	
Discharge parameters	Droplet break-up mechanism	Droplet break-up mechanism - instantaneous	Use flashing 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
	Standardised toxic threshold concentrations	ERPG [1 hr]	No	

	and averaging times			
		IDLH [30 mins]	No	
		STEL [15 mins]	No	
Bund, building and terrain	Terrain and bund definition	Type of terrain for dispersion	Land	
		Type of pool substrate and bunds	Armazém automático	
Toxic parameters	Indoor toxic calculations	Specify the downwind building type	Unselected	
		Building type (downwind building type)	Buildings\Building type	
	Exposure time data	Set averaging time equal to exposure time	Use a fixed averaging time	
		Cut-off fraction of toxic load for exposure time calculation	0,05	fraction
		Cut-off concentration for exposure time calculations	0	fraction
	Toxic contours	Number of toxic levels	4	
		Dose levels [ppm^n.min]	130000; 1,3E+06; 1,3E+07; 1,3E+08	
		Probit levels	2; 3; 4; 10	
		Lethality levels	0,001; 0,01; 0,1; 0,99	fraction