Tai Po Project Biogas 22Feb2022 (RunRow STW

Parameters

Discharge Parameters

Continuous Critical Weber number	12.5	
Instantaneous Critical Weber number	12.5	
Venting equation constant	24.82	
Relief valve safety factor	1.2	
Minimum RV diameter ratio	1	
Critical pressure greater than flow phase	0.3447	bar
Maximum release velocity	500	m/s
Minimum drop diameter allowed	0.01	um
Maximum drop diameter allowed	1E4	um
Default Liquid Fraction	1	fraction
Continuous Drop Slip factor	1	
Instantaneous Drop Slip factor	1	
Number of Time Steps	100.00	
Maximum Number of Data Points	1,000.00	
Tolerance	0.0001	
Thermal coupling to the wall	No modelling of heat transfer	
Use Bernoulli for forced -phase liq-liq discharge	Use compressible flow eqn	
Capping of pipe flow rates	Use leak scenario cap, disallow flashing	
Velocity capping method	FixedVelocity	
Droplet Method - continuous only	Modified CCPS	
Thermodynamic Option for Gas Pipellines	Non-ideal Gas	
Excess Flow Valve velocity head losses	0	
Non-Return Valve velocity head losses	0	
Shut-Off Valve velocity head losses	0	
Frequency of bends in long pipes	0	/m
Frequency of couplings in long pipes	0	/m
Frequency of junctions in long pipes	0	/m
Line length	10	m
Pipe roughness	0.0457	mm
Air changes	3	/hr
Elevation	1	m
Atmospheric Expansion Method	Closest to Initial Conditions	
Tank Roof Failure Model Effects	Instantaneous effects	
Frequency of Excess Flow Valves	0	/m
Frequency of Non-Return Valves	0	/m
Frequency of Shut-Off Valves	0	/m
Mechanism for forcing droplet breakup - Inst.	Use flashing correlation	
Mechanism for forcing droplet breakup - Cont	Do not force correlation	
Flashing in the orifice	No flashing in the orifice	
Handling of droplets	Not Trapped	
Indoor mass modification factor	3	
Vacuum Relief Valve	Operating	
Vacuum Relief Valve Set Point	0	bar

Dispersion Parameters

Expansion zone length/source diameter ratio	0.01	
Near Field Passive Entrainment Parameter	1	
Jet Model	Morton et.al.	
Jet entrainment coefficient alpha1	0.17	
Jet entrainment coefficient alpha2	0.35	

Drag coefficient between plume and air	0	
Dense cloud parameter gamma - continuous	0	
Dense cloud parameter gamma - instant	0.3	
Dense cloud parameter K - continuous	1.15	
Dense cloud parameter K - instantaneous	1.15	
Modeling of instantaneous expansion	Standard Method	
Maximum Cloud/Ambient Velocity Difference	0.1	
Maximum Cloud/Ambient Density Difference	0.015	
Maximum Non-passive entrainment fraction	0.3	
Maximum Richardson number	15	
Distance multiple for full passive entrainment	2	
Core Averaging Time	18.75	s
Ratio instantaneous/continuous sigma-y	1	
Ratio instantaneous/continuous sigma-z	1	
Droplet evaporation thermodynamics model	Rainout, Non-equilibrium	
Ratio Droplet/ expansion velocity for inst. release	0.8	
Expansion energy cutoff for droplet angle	0.69	kJ/kg
Coefficient of Initial Rainout	0	
Flag to reset rainout position	Do not reset rainout position	
Richardson Number for passive transition above pool	0.015	
Pool Vaporization entrainment parameter	1.5	
Richardson number criterion for cloud lift-off	-20	
Flag for Heat/Water vapor transfer	Heat and Water	
Surface over which the dispersion occurs	Land	
Minimum temperature allowed	-262.1	degC
Maximum temperature allowed	626.9	degC
Minimum release velocity for cont. release	0.1	m/s
Minimum Continuous Release Height	0	m
Maximum distance for dispersion	5E4	m
Maximum height for dispersion	1000	m
Minimum cloud depth	0.02	m
Treatment of top mixing layer	Constrained	
Model In Use	Best Estimate	
Lee Length	Calculate	
Lee Half-Width	Calculate	
Lee Height	Calculate	
K-Factor	Calculate	
Switch Distance	Calculate	
Maximum Initial Step Size	10	m
Minimum Number of Steps per Zone	5.00	
Factor for Step Increase	1.2	
Maximum Number of Output Steps	1,000.00	
Flag for finite duration correction	QI without Duration Adjustment	
Quasi-instantaneous transition parameter	0.8	
Relative tolerance for dispersion calculations	0.001	
Relative tolerance for droplet calculations	0.001	
Initial integration step size - Instantaneous	0.01	s
Initial integration step size - Continuous	0.01	m
Maximum integration step size - Instantaneous	100	s
Maximum integration step size - Continuous	100	m
Criterion for halting dispersion model	Risk based	
Impingement Option	Use Velocity Modification Factor	
Impinged velocity limit	500	m/s
Impinged Velocity Factor	0.25	
Dispersion Model to use	Version 2 model	

Fixed step size - Instantaneous	0.01	s
Fixed step size - Continuous	0.1	m
Number of fixed size output steps	20.00	
Multiplier for output step sizes	1.2	

Event Tree Probabilities

Probability of a BLEVE	1	fraction
Probability of a Pool Fire	1	fraction
Toxic Probability	1	fraction
Continuous no Rainout Immediate Ignition	0.3	fraction
Continuous no Rainout Long Duration Horizontal Fraction	0.6	fraction
Continuous no Rainout Long Duration Horizontal Jet Fire	1	fraction
Continuous no Rainout Long Duration Vertical Jet Fire	1	fraction
Continuous no Rainout Short Duration Fraction	1	fraction
Continuous no Rainout Short Duration BLEVE	1	fraction
Continuous no Rainout Short Duration Flash Fire	0	fraction
Continuous no Rainout Short Duration Explosion	0	fraction
Continuous no Rainout Delayed Ignition Flash Fire	1	fraction
Continuous no Rainout Delayed Ignition Explosion	0	fraction
Continuous with Rainout Immediate Ignition	0.3	fraction
Continuous with Rainout Long Duration Horizontal Fraction	0.6	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Pool Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire with Pool Fire	1	fraction
Continuous with Rainout Long Duration Vertical Pool Fire	0	fraction
Continuous with Rainout Long Duration Vertical Jet Fire	0	fraction
Continuous with Rainout Short Duration Fraction	1	fraction
Continuous with Rainout Long Duration Vertical Jet Fire with Pool Fire	1	fraction
Continuous with Rainout Short Duration BLEVE with Pool Fire	1	fraction
Continuous with Rainout Short Duration BLEVE alone	0	fraction
Continuous with Rainout Short Duration Flash Fire with Pool Fire	0	fraction
Continuous with Rainout Short Duration Flash Fire Alone	0	fraction
Continuous with Rainout Short Duration Explosion with Pool Fire	0	fraction
Continuous with Rainout Short Duration Explosion Alone	0	fraction
Continuous with Rainout Short Duration Pool Fire	0	fraction
Continuous with Rainout Residual Pool Fire	0.15	fraction
Continuous with Rainout Delayed Ignition Flash Fire	1	fraction
Continuous with Rainout Delayed Ignition Explosion	0	fraction
Instantaneous no Rainout Immediate Ignition	0.3	fraction
Instantaneous no Rainout BLEVE	1	fraction
Instantaneous no Rainout Immediate Flash Fire	0	fraction
Instantaneous no Rainout Immediate Explosion	0	fraction
Instantaneous no Rainout Delayed Ignition Flash Fire	1	fraction
Instantaneous no Rainout Delayed Ignition Explosion	0	fraction
Instantaneous with Rainout Immediate Ignition	0.3	fraction
Instantaneous with Rainout BLEVE with Pool Fire	1	fraction
Instantaneous with Rainout BLEVE Alone	0	fraction
Instantaneous with Rainout Immediate Flash Fire with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Flash Fire Alone	0	fraction
Instantaneous with Rainout Immediate Explosion with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Explosion Alone	0	fraction
Instantaneous with Rainout Immediate Pool Fire Alone	0	fraction
Instantaneous with Rainout Residual Pool Fire	0.15	fraction
Instantaneous with Rainout Delayed Ignition Flash Fire	1	fraction
Instantaneous with Rainout Delayed Ignition Explosion	0	fraction

Immediate Ignition	0.1	fraction
Explosion Given Ignition	0.5	fraction
Long Duration Jet Fire	0.5	fraction
Short Duration Any Ignition of Cloud	0.5	fraction
Short Duration Ignition of Cloud with Pool Fire	0	fraction
Long Duration Horizontal Jet Fire with Pool	0	fraction
Long Duration Vertical Jet Fire with Pool	0	fraction
Short Duration Fraction for Effects	0	fraction
Short Duration BLEVE not Flash Fire	0.5	fraction
Volume based explosion probabilities	No	
FlamespeedLowMedium	0.45	m/s
FlamespeedMediumHigh	0.75	m/s
Obstructed Cloud Volume (1)	200	m3
Obstructed Cloud Volume (2)	3000	m3
Obstructed Cloud Volume (3)	6000	m3
Low Flame Speed Probability (1)	0	fraction
Low Flame Speed Probability (2)	0.3	fraction
Low Flame Speed Probability (3)	0.6	fraction
Medium Flame Speed Probability (1)	0.3	fraction
Medium Flame Speed Probability (2)	0.6	fraction
Medium Flame Speed Probability (3)	0.9	fraction
High Flame Speed Probability (1)	0.6	fraction
High Flame Speed Probability (2)	0.9	fraction
High Flame Speed Probability (3)	1	fraction

Explosion Parameters

Over Pressure Level 1	0.02068	bar
Over Pressure Level 2	0.1379	bar
Over Pressure Level 3	0.2068	bar
Explosion Location Criterion	Cloud Front (LFL Fraction)	
Minimum explosive mass	0	kg
Minimum Explosion Energy	5E6	kJ
Explosion Efficiency	0.1	fraction
Coefficient for zone of heavy damage	0.03	
Coefficient for zone of light damage	0.06	
Explosion efficiency	10	%
Air or Ground burst	Air burst	
Explosion Mass Modification Factor	3	
Use of mass modification factor	Early and late explosions	

Fireball and BLEVE Blast Parameters

Maximum surface emissive power	400	kW/m2
Radiation Dose for Fireball risk calculations	5.784E6	
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	
TNO model flame temperature	1727	degC
Mass Modification Factor	3	
Calculation method for fireball	DNV Recommended	
Fireball Maximum Exposure Duration	20	s
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	

Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	

Flammable Parameters

Height for calculation of flammable effects	1	m
Flammable result grid step in X-direction	10	m
LFL fraction to finish	1	
Angle of inclination	0	deg
Observer direction	Variable	
Flammable mass calculation method	Mass between LFL and UFL	
Flammable Base averaging time	18.75	s
Radiation level for Jet/Pool Fire Risk	35	kW/m2
Cut Off fraction for cloud volume	0.001	fraction
UFL Multiple for immediate ignition	1	
Cut Off Time for Short Continuous Releases	20	s
Observer type radiation modelling flag	Planar	
Probit A Value	-36.38	
Probit B Value	2.56	
Probit N Value	1.333	
Height for reports	Centreline Height	
Angle of orientation	0	deg
Relative tolerance for radiation calculations	0.01	fraction
Number of Lethality Ellipses	5.00	
Ellipse linear spacing variable	Probit	
Minimum Probability Of Death	0.01	fraction
Number of radiation/distance points in linked radiation calculations	50.00	
Method for fitting ellipse to flash fire shape	ChiSq method	
Absolute tolerance for linked radiation calcs	1e-010	
Solar radiation	Exclude from calculations	
For time-varying releases	Don't Model Short Duration Effects	
Match fireball duration and mass released	No	

General Parameters

Maximum release duration	3600	s
Height for concentration output	0	m
Rotation	0	deg
Lower Elevation	0	m
Multicomponent aerosol behaviour	Single aerosol modelling	

General Risk Parameters

Use Free Field Modelling	No Free Field	
Distance to Site Boundary	0	m
Late Pool Fire	Exclude Effects	
Minimum Case Frequency	1e-012	/AvgeYear
Minimum Event Probability	1e-012	
Population Omega Factor	0	
Maximum Number of Subsquares across Ellipse	10.00	
Maximum Number of Subdivisions per Square	1.00	
Factor for Toxic F-N Spread	2	
Grid Sizing	Calculated	
Grid Bounds Minimum X	-1000	m
Grid Bounds Maximum X	1000	m
Grid Bounds Minimum Y	-1000	m
Grid Bounds Maximum Y	1000	m
Grid Calculation Method	Number of cells	
Grid cell size	10	m
Maximum number of cells	40,000.00	
Aversion Index	1.2	
Indoor Population Omega Factor	0	
Number of wind subdivisions per sector	1.00	
Method for handling Indoor/Outdoor risk	Indoor and outdoor risk calculations	
Inter-ellipse interpolation method	Weighted	
Method option	Normal dispersion	
Cylinder height over radius ratio	3	
Building damage method	Worst point	
Reflection method	Calculated Angle	
Number of X steps per view	11.00	
Minimum X step	0.1	m
Number of time steps - continuous clouds	5.00	
Between Cloud Views	Minimise Gaps	
Pressure exceedance curves	Calculate	
Elevation of Floor or Ceiling	0	m
Concentration method for filling	Stoichiometric	
Minimum probability of death for explosions	0.001	
Minimum Pressure Filter	0.01	bar
Separation specification	Use Ratio	
Critical Separation Ratio	0.5	
Cloud Shape of Area Integration	Elliptical	
Explosion efficiency method	100% efficiency	
Explosion Type Calculation Method	Polynomial Curve-Fit Equations	
Number of Blast Curve Discretization Points	30,000.00	
Maximum No. effect points along transect	2.00	
Low to medium criterion	0.006	
Medium to high criterion	0.08	
Options available	Volume Averaged	
Method option:	Ground reflection	
Reflection factor	1	
Unconfined Explosion Strength	2	
Explosion Efficiency	1	fraction
Flammable Mass Calculation Type	Area Weighted Mass Integral	
Minimum Explosion Energy	0	kJ
Maximum number of time steps	100.00	
Number of timesteps - time varying clouds	10.00	
Active Shut Down	No Shut Down	

Fraction of Population Indoors for Societal Risk	0.9	fraction
Fraction of Population Indoors for Individual Risk	0	fraction

Indoor Vulnerability

Vulnerability Model	Discrete Overpressure	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.1	bar
Overpressure for Lethality (2)	0.3	bar
Lethality (1)	0.025	fraction
Lethality (2)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	-10.46	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	2.00	
Number of impulses	1.00	
Pool Fire Radiation Soc Vulnerabilities (1)	0.001	fraction
Pool Fire Radiation Soc Vulnerabilities (2)	0.05	fraction
Pool Fire Radiation Soc Vulnerabilities (3)	0.099	fraction
Pool Fire Radiation Ind Vulnerabilities (1)	0.001	fraction
Pool Fire Radiation Ind Vulnerabilities (2)	0.05	fraction
Pool Fire Radiation Ind Vulnerabilities (3)	0.099	fraction
Fire Ball Radiation Soc Vulnerabilities (1)	0.001	fraction
Fire Ball Radiation Soc Vulnerabilities (2)	0.05	fraction
Fire Ball Radiation Soc Vulnerabilities (3)	0.099	fraction
Fire Ball Radiation Ind Vulnerabilities (1)	0.001	fraction
Fire Ball Radiation Ind Vulnerabilities (2)	0.05	fraction
Fire Ball Radiation Ind Vulnerabilities (3)	0.099	fraction
Jet Fire Radiation Soc Vulnerabilities (1)	0.001	fraction
Jet Fire Radiation Soc Vulnerabilities (2)	0.05	fraction
Jet Fire Radiation Soc Vulnerabilities (3)	0.099	fraction
Jet Fire Radiation Ind Vulnerabilities (1)	0.001	fraction
Jet Fire Radiation Ind Vulnerabilities (2)	0.05	fraction
Jet Fire Radiation Ind Vulnerabilities (3)	0.099	fraction
Exposure time required for damage from Pool Fire	20	s
Exposure time required for damage from Jet Fire	20	s
Fireball (Societal Radiation Criteria Zone)	0.1	fraction
Fireball (Individual Radiation Criteria Zone)	0.1	fraction
Fireball (Societal Flammable Probit Zone)	0.1	fraction
Fireball (Individual Flammable Probit Zone)	0.1	fraction
Jet Fire (Societal Radiation Criteria Zone)	0.1	fraction
Jet Fire (Individual Radiation Criteria Zone)	0.1	fraction
Jet Fire (Societal Flammable Probit Zone)	0.1	fraction
Jet Fire (Individual Flammable Probit Zone)	0.1	fraction
Pool Fire (Societal Radiation Criteria Zone)	0.1	fraction
Pool Fire (Individual Radiation Criteria Zone)	0.1	fraction
Pool Fire (Societal Flammable Probit Zone)	0.1	fraction
Pool Fire (Individual Flammable Probit Zone)	0.1	fraction
Light Explosion Damage vulnerability	0.025	fraction

Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	9.8	kW/m2
Pool Fire Radiation Intensity Level (2)	19.5	kW/m2
Pool Fire Radiation Intensity Level (3)	35	kW/m2
Jet Fire Radiation Intensity Level (1)	9.8	kW/m2
Jet Fire Radiation Intensity Level (2)	19.5	kW/m2
Jet Fire Radiation Intensity Level (3)	35	kW/m2
Fire Ball Radiation Intensity Level (1)	9.8	kW/m2
Fire Ball Radiation Intensity Level (2)	19.5	kW/m2
Fire Ball Radiation Intensity Level (3)	35	kW/m2

Jet Fire Parameters

Maximum SEP for a Jet Fire	400	kW/m2
Jet Fire Averaging Time	20	s
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	
Crosswind Angle	0	deg
Correlation	DNV Recommended	
Horizontal Options	Use standard method	
Rate Modification Factor	3	
Jet Fire Maximum Exposure Duration	20	s
Emissivity Method	E and F calculated	
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Outdoor Vulnerability

Vulnerability Model	Overpressure Probit Method	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.3	bar
Lethality (1)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	1.47	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	1.00	

Number of impulses	1.00	
Pool Fire Radiation Soc Vulnerabilities (1)	0.01	fraction
Pool Fire Radiation Soc Vulnerabilities (2)	0.5	fraction
Pool Fire Radiation Soc Vulnerabilities (3)	0.99	fraction
Pool Fire Radiation Ind Vulnerabilities (1)	0.01	fraction
Pool Fire Radiation Ind Vulnerabilities (2)	0.5	fraction
Pool Fire Radiation Ind Vulnerabilities (3)	0.99	fraction
Fire Ball Radiation Soc Vulnerabilities (1)	0.01	fraction
Fire Ball Radiation Soc Vulnerabilities (2)	0.5	fraction
Fire Ball Radiation Soc Vulnerabilities (3)	0.99	fraction
Fire Ball Radiation Ind Vulnerabilities (1)	0.01	fraction
Fire Ball Radiation Ind Vulnerabilities (2)	0.5	fraction
Fire Ball Radiation Ind Vulnerabilities (3)	0.99	fraction
Jet Fire Radiation Soc Vulnerabilities (1)	0.01	fraction
Jet Fire Radiation Soc Vulnerabilities (2)	0.5	fraction
Jet Fire Radiation Soc Vulnerabilities (3)	0.99	fraction
Jet Fire Radiation Ind Vulnerabilities (1)	0.01	fraction
Jet Fire Radiation Ind Vulnerabilities (2)	0.5	fraction
Jet Fire Radiation Ind Vulnerabilities (3)	0.99	fraction
Exposure time required for damage from Pool Fire	20	s
Exposure time required for damage from Jet Fire	20	s
Fireball (Societal Radiation Criteria Zone)	1	fraction
Fireball (Individual Radiation Criteria Zone)	1	fraction
Fireball (Societal Flammable Probit Zone)	1	fraction
Fireball (Individual Flammable Probit Zone)	1	fraction
Jet Fire (Societal Radiation Criteria Zone)	1	fraction
Jet Fire (Individual Radiation Criteria Zone)	1	fraction
Jet Fire (Societal Flammable Probit Zone)	1	fraction
Jet Fire (Individual Flammable Probit Zone)	1	fraction
Pool Fire (Societal Radiation Criteria Zone)	1	fraction
Pool Fire (Individual Radiation Criteria Zone)	1	fraction
Pool Fire (Societal Flammable Probit Zone)	1	fraction
Pool Fire (Individual Flammable Probit Zone)	1	fraction
Light Explosion Damage vulnerability	0	fraction
Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	9.8	kW/m2
Pool Fire Radiation Intensity Level (2)	19.5	kW/m2
Pool Fire Radiation Intensity Level (3)	35	kW/m2
Jet Fire Radiation Intensity Level (1)	9.8	kW/m2
Jet Fire Radiation Intensity Level (2)	19.5	kW/m2
Jet Fire Radiation Intensity Level (3)	35	kW/m2
Fire Ball Radiation Intensity Level (1)	9.8	kW/m2
Fire Ball Radiation Intensity Level (2)	19.5	kW/m2
Fire Ball Radiation Intensity Level (3)	35	kW/m2

Pool Fire Parameters

Instantaneous releases	10	s
Continuous releases	10	s
Calculate Dose	Not selected	
Calculate Probit	Not selected	
Calculate Lethality	Not selected	
MaxExposureDuration	20	s

Radiative fraction for general fires	0.4	fraction
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Pool Vaporization Parameters

Toxics cut-off rate for pool evaporation	0.001	kg/s
Flammable cut-off rate for pool evaporation	0.1	kg/s
Concentration power to use in pool rate load calculation	1	
Maximum number of pool evaporation rates	10.00	
Pool minimum thickness	5	mm
Surface thermal conductivity	0.00221	kJ/m.s.degK
Surface roughness factor	2.634	
Surface thermal diffusivity	9.48E-7	m2/s
Type of Bund Surface	Concrete	
Bund Height	0	m
Bund Failure Modeling	Bund cannot fail	

Toxic Parameters

Toxics: minimum probability of death	0.001	
Toxics: height for calculation of effects	0	m
Toxics: results grid step in Y-direction	2.5	m
Toxics: results grid step in X-direction	25	m
Multi-comp. toxic calc. method	Most Toxic Material Probit	
Toxic Averaging Time - New Parameter	600	s
Probit Calculation Method	Use Probit	
Building Exchange Rate	4	/hr
Tail Time	1800	s
Indoor Calculations	Selected	
Wind Dependent Exchange Rate	Case Specified	
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

Weather Parameters

Atmospheric pressure	1.013	bar
Atmospheric molecular weight	28.97	
Atmospheric specific heat at constant pressure	1.004	kJ/kg.degK
Wind speed reference height	10	m
Temperature reference height	0	m
Cut-off height for wind speed profile	1	m
Wind speed profile	Power Law	
Atmospheric T and P Profile	Temp.Logarithmic; Pres.Linear	
Atmospheric Temperature	25	degC
Relative Humidity	0.8	fraction
Parameter	0.1	
Length	183.2	mm

Surface Roughness	Use Parameter	
Surface Temperature for Dispersion Calculations	25	degC
Surface Temperature for Pool Calculations	25	degC
Solar Radiation Flux	0.5	kW/m2
Building Exchange Rate	4	/hr
Tail Time	1800	s
Surface Type	User-defined	
Mixing Layer Height for Pasquil Stability A	1300	m
Mixing Layer Height for Pasquil Stability A/B	1080	m
Mixing Layer Height for Pasquil Stability B	920	m
Mixing Layer Height for Pasquil Stability B/C	880	m
Mixing Layer Height for Pasquil Stability C	840	m
Mixing Layer Height for Pasquil Stability C/D	820	m
Mixing Layer Height for Pasquil Stability D	800	m
Mixing Layer Height for Pasquil Stability E	400	m
Mixing Layer Height for Pasquil Stability F	100	m
Mixing Layer Height for Pasquil Stability G	100	m

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Parameters

Discharge Parameters

Continuous Critical Weber number	12.5	
Instantaneous Critical Weber number	12.5	
Venting equation constant	24.82	
Relief valve safety factor	1.2	
Minimum RV diameter ratio	1	
Critical pressure greater than flow phase	0.3447	bar
Maximum release velocity	500	m/s
Minimum drop diameter allowed	0.01	um
Maximum drop diameter allowed	1E4	um
Default Liquid Fraction	1	fraction
Continuous Drop Slip factor	1	
Instantaneous Drop Slip factor	1	
Number of Time Steps	100.00	
Maximum Number of Data Points	1,000.00	
Tolerance	0.0001	
Thermal coupling to the wall	No modelling of heat transfer	
Use Bernoulli for forced -phase liq-liq discharge	Use compressible flow eqn	
Capping of pipe flow rates	Use leak scenario cap, disallow flashing	
Velocity capping method	FixedVelocity	
Droplet Method - continuous only	Modified CCPS	
Thermodynamic Option for Gas Pipellines	Non-ideal Gas	
Excess Flow Valve velocity head losses	0	
Non-Return Valve velocity head losses	0	
Shut-Off Valve velocity head losses	0	
Frequency of bends in long pipes	0	/m
Frequency of couplings in long pipes	0	/m
Frequency of junctions in long pipes	0	/m
Line length	10	m
Pipe roughness	0.0457	mm
Air changes	3	/hr
Elevation	1	m
Atmospheric Expansion Method	Closest to Initial Conditions	
Tank Roof Failure Model Effects	Instantaneous effects	
Frequency of Excess Flow Valves	0	/m
Frequency of Non-Return Valves	0	/m
Frequency of Shut-Off Valves	0	/m
Mechanism for forcing droplet breakup - Inst.	Use flashing correlation	
Mechanism for forcing droplet breakup - Cont	Do not force correlation	
Flashing in the orifice	No flashing in the orifice	
Handling of droplets	Not Trapped	
Indoor mass modification factor	3	
Vacuum Relief Valve	Operating	
Vacuum Relief Valve Set Point	0	bar

Dispersion Parameters

Expansion zone length/source diameter ratio	0.01	
Near Field Passive Entrainment Parameter	1	
Jet Model	Morton et.al.	
Jet entrainment coefficient alpha1	0.17	
Jet entrainment coefficient alpha2	0.35	

Drag coefficient between plume and air	0	
Dense cloud parameter gamma - continuous	0	
Dense cloud parameter gamma - instant	0.3	
Dense cloud parameter K - continuous	1.15	
Dense cloud parameter K - instantaneous	1.15	
Modeling of instantaneous expansion	Standard Method	
Maximum Cloud/Ambient Velocity Difference	0.1	
Maximum Cloud/Ambient Density Difference	0.015	
Maximum Non-passive entrainment fraction	0.3	
Maximum Richardson number	15	
Distance multiple for full passive entrainment	2	
Core Averaging Time	18.75	s
Ratio instantaneous/continuous sigma-y	1	
Ratio instantaneous/continuous sigma-z	1	
Droplet evaporation thermodynamics model	Rainout, Non-equilibrium	
Ratio Droplet/ expansion velocity for inst. release	0.8	
Expansion energy cutoff for droplet angle	0.69	kJ/kg
Coefficient of Initial Rainout	0	
Flag to reset rainout position	Do not reset rainout position	
Richardson Number for passive transition above pool	0.015	
Pool Vaporization entrainment parameter	1.5	
Richardson number criterion for cloud lift-off	-20	
Flag for Heat/Water vapor transfer	Heat and Water	
Surface over which the dispersion occurs	Land	
Minimum temperature allowed	-262.1	degC
Maximum temperature allowed	626.9	degC
Minimum release velocity for cont. release	0.1	m/s
Minimum Continuous Release Height	0	m
Maximum distance for dispersion	5E4	m
Maximum height for dispersion	1000	m
Minimum cloud depth	0.02	m
Treatment of top mixing layer	Constrained	
Model In Use	Best Estimate	
Lee Length	Calculate	
Lee Half-Width	Calculate	
Lee Height	Calculate	
K-Factor	Calculate	
Switch Distance	Calculate	
Maximum Initial Step Size	10	m
Minimum Number of Steps per Zone	5.00	
Factor for Step Increase	1.2	
Maximum Number of Output Steps	1,000.00	
Flag for finite duration correction	QI without Duration Adjustment	
Quasi-instantaneous transition parameter	0.8	
Relative tolerance for dispersion calculations	0.001	
Relative tolerance for droplet calculations	0.001	
Initial integration step size - Instantaneous	0.01	s
Initial integration step size - Continuous	0.01	m
Maximum integration step size - Instantaneous	100	s
Maximum integration step size - Continuous	100	m
Criterion for halting dispersion model	Risk based	
Impingement Option	Use Velocity Modification Factor	
Impinged velocity limit	500	m/s
Impinged Velocity Factor	0.25	
Dispersion Model to use	Version 2 model	

Fixed step size - Instantaneous	0.01	s
Fixed step size - Continuous	0.1	m
Number of fixed size output steps	20.00	
Multiplier for output step sizes	1.2	

Event Tree Probabilities

Probability of a BLEVE	1	fraction
Probability of a Pool Fire	1	fraction
Toxic Probability	1	fraction
Continuous no Rainout Immediate Ignition	0.3	fraction
Continuous no Rainout Long Duration Horizontal Fraction	0.6	fraction
Continuous no Rainout Long Duration Horizontal Jet Fire	1	fraction
Continuous no Rainout Long Duration Vertical Jet Fire	1	fraction
Continuous no Rainout Short Duration Fraction	1	fraction
Continuous no Rainout Short Duration BLEVE	1	fraction
Continuous no Rainout Short Duration Flash Fire	0	fraction
Continuous no Rainout Short Duration Explosion	0	fraction
Continuous no Rainout Delayed Ignition Flash Fire	0.6	fraction
Continuous no Rainout Delayed Ignition Explosion	0.4	fraction
Continuous with Rainout Immediate Ignition	0.3	fraction
Continuous with Rainout Long Duration Horizontal Fraction	0.6	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Pool Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire with Pool Fire	1	fraction
Continuous with Rainout Long Duration Vertical Pool Fire	0	fraction
Continuous with Rainout Long Duration Vertical Jet Fire	0	fraction
Continuous with Rainout Short Duration Fraction	1	fraction
Continuous with Rainout Long Duration Vertical Jet Fire with Pool Fire	1	fraction
Continuous with Rainout Short Duration BLEVE with Pool Fire	1	fraction
Continuous with Rainout Short Duration BLEVE alone	0	fraction
Continuous with Rainout Short Duration Flash Fire with Pool Fire	0	fraction
Continuous with Rainout Short Duration Flash Fire Alone	0	fraction
Continuous with Rainout Short Duration Explosion with Pool Fire	0	fraction
Continuous with Rainout Short Duration Explosion Alone	0	fraction
Continuous with Rainout Short Duration Pool Fire	0	fraction
Continuous with Rainout Residual Pool Fire	0.15	fraction
Continuous with Rainout Delayed Ignition Flash Fire	0.6	fraction
Continuous with Rainout Delayed Ignition Explosion	0.4	fraction
Instantaneous no Rainout Immediate Ignition	0.3	fraction
Instantaneous no Rainout BLEVE	1	fraction
Instantaneous no Rainout Immediate Flash Fire	0	fraction
Instantaneous no Rainout Immediate Explosion	0	fraction
Instantaneous no Rainout Delayed Ignition Flash Fire	0.6	fraction
Instantaneous no Rainout Delayed Ignition Explosion	0.4	fraction
Instantaneous with Rainout Immediate Ignition	0.3	fraction
Instantaneous with Rainout BLEVE with Pool Fire	1	fraction
Instantaneous with Rainout BLEVE Alone	0	fraction
Instantaneous with Rainout Immediate Flash Fire with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Flash Fire Alone	0	fraction
Instantaneous with Rainout Immediate Explosion with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Explosion Alone	0	fraction
Instantaneous with Rainout Immediate Pool Fire Alone	0	fraction
Instantaneous with Rainout Residual Pool Fire	0.15	fraction
Instantaneous with Rainout Delayed Ignition Flash Fire	0.6	fraction
Instantaneous with Rainout Delayed Ignition Explosion	0.4	fraction

Immediate Ignition	0.1	fraction
Explosion Given Ignition	0.5	fraction
Long Duration Jet Fire	0.5	fraction
Short Duration Any Ignition of Cloud	0.5	fraction
Short Duration Ignition of Cloud with Pool Fire	0	fraction
Long Duration Horizontal Jet Fire with Pool	0	fraction
Long Duration Vertical Jet Fire with Pool	0	fraction
Short Duration Fraction for Effects	0	fraction
Short Duration BLEVE not Flash Fire	0.5	fraction
Volume based explosion probabilities	No	
FlamespeedLowMedium	0.45	m/s
FlamespeedMediumHigh	0.75	m/s
Obstructed Cloud Volume (1)	200	m3
Obstructed Cloud Volume (2)	3000	m3
Obstructed Cloud Volume (3)	6000	m3
Low Flame Speed Probability (1)	0	fraction
Low Flame Speed Probability (2)	0.3	fraction
Low Flame Speed Probability (3)	0.6	fraction
Medium Flame Speed Probability (1)	0.3	fraction
Medium Flame Speed Probability (2)	0.6	fraction
Medium Flame Speed Probability (3)	0.9	fraction
High Flame Speed Probability (1)	0.6	fraction
High Flame Speed Probability (2)	0.9	fraction
High Flame Speed Probability (3)	1	fraction

Explosion Parameters

Over Pressure Level 1	0.02068	bar
Over Pressure Level 2	0.1379	bar
Over Pressure Level 3	0.2068	bar
Explosion Location Criterion	Cloud Front (LFL Fraction)	
Minimum explosive mass	0	kg
Minimum Explosion Energy	5E6	kJ
Explosion Efficiency	0.1	fraction
Coefficient for zone of heavy damage	0.03	
Coefficient for zone of light damage	0.06	
Explosion efficiency	10	%
Air or Ground burst	Air burst	
Explosion Mass Modification Factor	3	
Use of mass modification factor	Early and late explosions	

Fireball and BLEVE Blast Parameters

Maximum surface emissive power	400	kW/m2
Radiation Dose for Fireball risk calculations	5.784E6	
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	
TNO model flame temperature	1727	degC
Mass Modification Factor	3	
Calculation method for fireball	DNV Recommended	
Fireball Maximum Exposure Duration	20	s
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	

Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	

Flammable Parameters

Height for calculation of flammable effects	0	m
Flammable result grid step in X-direction	10	m
LFL fraction to finish	1	
Angle of inclination	0	deg
Observer direction	Variable	
Flammable mass calculation method	Mass between LFL and UFL	
Flammable Base averaging time	18.75	s
Radiation level for Jet/Pool Fire Risk	35	kW/m2
Cut Off fraction for cloud volume	0.001	fraction
UFL Multiple for immediate ignition	1	
Cut Off Time for Short Continuous Releases	20	s
Observer type radiation modelling flag	Planar	
Probit A Value	-36.38	
Probit B Value	2.56	
Probit N Value	1.333	
Height for reports	Centreline Height	
Angle of orientation	0	deg
Relative tolerance for radiation calculations	0.01	fraction
Number of Lethality Ellipses	5.00	
Ellipse linear spacing variable	Probit	
Minimum Probability Of Death	0.01	fraction
Number of radiation/distance points in linked radiation calculations	50.00	
Method for fitting ellipse to flash fire shape	ChiSq method	
Absolute tolerance for linked radiation calcs	1e-010	
Solar radiation	Exclude from calculations	
For time-varying releases	Don't Model Short Duration Effects	
Match fireball duration and mass released	No	

General Parameters

Maximum release duration	3600	s
Height for concentration output	0	m
Rotation	0	deg
Lower Elevation	0	m
Multicomponent aerosol behaviour	Single aerosol modelling	

General Risk Parameters

Use Free Field Modelling	No Free Field	
Distance to Site Boundary	0	m
Late Pool Fire	Exclude Effects	
Minimum Case Frequency	1e-012	/AvgeYear
Minimum Event Probability	1e-012	
Population Omega Factor	0	
Maximum Number of Subsquares across Ellipse	10.00	
Maximum Number of Subdivisions per Square	1.00	
Factor for Toxic F-N Spread	2	
Grid Sizing	Calculated	
Grid Bounds Minimum X	-1000	m
Grid Bounds Maximum X	1000	m
Grid Bounds Minimum Y	-1000	m
Grid Bounds Maximum Y	1000	m
Grid Calculation Method	Number of cells	
Grid cell size	10	m
Maximum number of cells	40,000.00	
Aversion Index	1.2	
Indoor Population Omega Factor	0	
Number of wind subdivisions per sector	1.00	
Method for handling Indoor/Outdoor risk	Indoor and outdoor risk calculations	
Inter-ellipse interpolation method	Weighted	
Method option	Normal dispersion	
Cylinder height over radius ratio	3	
Building damage method	Worst point	
Reflection method	Calculated Angle	
Number of X steps per view	11.00	
Minimum X step	0.1	m
Number of time steps - continuous clouds	5.00	
Between Cloud Views	Minimise Gaps	
Pressure exceedance curves	Calculate	
Elevation of Floor or Ceiling	0	m
Concentration method for filling	Stoichiometric	
Minimum probability of death for explosions	0.001	
Minimum Pressure Filter	0.01	bar
Separation specification	Use Ratio	
Critical Separation Ratio	0.5	
Cloud Shape of Area Integration	Elliptical	
Explosion efficiency method	100% efficiency	
Explosion Type Calculation Method	Polynomial Curve-Fit Equations	
Number of Blast Curve Discretization Points	30,000.00	
Maximum No. effect points along transect	2.00	
Low to medium criterion	0.006	
Medium to high criterion	0.08	
Options available	Volume Averaged	
Method option:	Ground reflection	
Reflection factor	1	
Unconfined Explosion Strength	2	
Explosion Efficiency	1	fraction
Flammable Mass Calculation Type	Area Weighted Mass Integral	
Minimum Explosion Energy	0	kJ
Maximum number of time steps	100.00	
Number of timesteps - time varying clouds	10.00	
Active Shut Down	No Shut Down	

Fraction of Population Indoors for Societal Risk	0.9	fraction
Fraction of Population Indoors for Individual Risk	0	fraction

Indoor Vulnerability

Vulnerability Model	Discrete Overpressure	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.1	bar
Overpressure for Lethality (2)	0.3	bar
Lethality (1)	0.025	fraction
Lethality (2)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	-10.46	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	2.00	
Number of impulses	1.00	
Pool Fire Radiation Soc Vulnerabilities (1)	0.001	fraction
Pool Fire Radiation Soc Vulnerabilities (2)	0.05	fraction
Pool Fire Radiation Soc Vulnerabilities (3)	0.099	fraction
Pool Fire Radiation Ind Vulnerabilities (1)	0.001	fraction
Pool Fire Radiation Ind Vulnerabilities (2)	0.05	fraction
Pool Fire Radiation Ind Vulnerabilities (3)	0.099	fraction
Fire Ball Radiation Soc Vulnerabilities (1)	0.001	fraction
Fire Ball Radiation Soc Vulnerabilities (2)	0.05	fraction
Fire Ball Radiation Soc Vulnerabilities (3)	0.099	fraction
Fire Ball Radiation Ind Vulnerabilities (1)	0.001	fraction
Fire Ball Radiation Ind Vulnerabilities (2)	0.05	fraction
Fire Ball Radiation Ind Vulnerabilities (3)	0.099	fraction
Jet Fire Radiation Soc Vulnerabilities (1)	0.001	fraction
Jet Fire Radiation Soc Vulnerabilities (2)	0.05	fraction
Jet Fire Radiation Soc Vulnerabilities (3)	0.099	fraction
Jet Fire Radiation Ind Vulnerabilities (1)	0.001	fraction
Jet Fire Radiation Ind Vulnerabilities (2)	0.05	fraction
Jet Fire Radiation Ind Vulnerabilities (3)	0.099	fraction
Exposure time required for damage from Pool Fire	20	s
Exposure time required for damage from Jet Fire	20	s
Fireball (Societal Radiation Criteria Zone)	0.1	fraction
Fireball (Individual Radiation Criteria Zone)	0.1	fraction
Fireball (Societal Flammable Probit Zone)	0.1	fraction
Fireball (Individual Flammable Probit Zone)	0.1	fraction
Jet Fire (Societal Radiation Criteria Zone)	0.1	fraction
Jet Fire (Individual Radiation Criteria Zone)	0.1	fraction
Jet Fire (Societal Flammable Probit Zone)	0.1	fraction
Jet Fire (Individual Flammable Probit Zone)	0.1	fraction
Pool Fire (Societal Radiation Criteria Zone)	0.1	fraction
Pool Fire (Individual Radiation Criteria Zone)	0.1	fraction
Pool Fire (Societal Flammable Probit Zone)	0.1	fraction
Pool Fire (Individual Flammable Probit Zone)	0.1	fraction
Light Explosion Damage vulnerability	0.025	fraction

Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	9.8	kW/m2
Pool Fire Radiation Intensity Level (2)	19.5	kW/m2
Pool Fire Radiation Intensity Level (3)	35	kW/m2
Jet Fire Radiation Intensity Level (1)	9.8	kW/m2
Jet Fire Radiation Intensity Level (2)	19.5	kW/m2
Jet Fire Radiation Intensity Level (3)	35	kW/m2
Fire Ball Radiation Intensity Level (1)	9.8	kW/m2
Fire Ball Radiation Intensity Level (2)	19.5	kW/m2
Fire Ball Radiation Intensity Level (3)	35	kW/m2

Jet Fire Parameters

Maximum SEP for a Jet Fire	400	kW/m2
Jet Fire Averaging Time	20	s
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	
Crosswind Angle	0	deg
Correlation	DNV Recommended	
Horizontal Options	Use standard method	
Rate Modification Factor	3	
Jet Fire Maximum Exposure Duration	20	s
Emissivity Method	E and F calculated	
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Outdoor Vulnerability

Vulnerability Model	Overpressure Probit Method	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.3	bar
Lethality (1)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	1.47	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	1.00	

Number of impulses	1.00	
Pool Fire Radiation Soc Vulnerabilities (1)	0.01	fraction
Pool Fire Radiation Soc Vulnerabilities (2)	0.5	fraction
Pool Fire Radiation Soc Vulnerabilities (3)	0.99	fraction
Pool Fire Radiation Ind Vulnerabilities (1)	0.01	fraction
Pool Fire Radiation Ind Vulnerabilities (2)	0.5	fraction
Pool Fire Radiation Ind Vulnerabilities (3)	0.99	fraction
Fire Ball Radiation Soc Vulnerabilities (1)	0.01	fraction
Fire Ball Radiation Soc Vulnerabilities (2)	0.5	fraction
Fire Ball Radiation Soc Vulnerabilities (3)	0.99	fraction
Fire Ball Radiation Ind Vulnerabilities (1)	0.01	fraction
Fire Ball Radiation Ind Vulnerabilities (2)	0.5	fraction
Fire Ball Radiation Ind Vulnerabilities (3)	0.99	fraction
Jet Fire Radiation Soc Vulnerabilities (1)	0.01	fraction
Jet Fire Radiation Soc Vulnerabilities (2)	0.5	fraction
Jet Fire Radiation Soc Vulnerabilities (3)	0.99	fraction
Jet Fire Radiation Ind Vulnerabilities (1)	0.01	fraction
Jet Fire Radiation Ind Vulnerabilities (2)	0.5	fraction
Jet Fire Radiation Ind Vulnerabilities (3)	0.99	fraction
Exposure time required for damage from Pool Fire	20	s
Exposure time required for damage from Jet Fire	20	s
Fireball (Societal Radiation Criteria Zone)	1	fraction
Fireball (Individual Radiation Criteria Zone)	1	fraction
Fireball (Societal Flammable Probit Zone)	1	fraction
Fireball (Individual Flammable Probit Zone)	1	fraction
Jet Fire (Societal Radiation Criteria Zone)	1	fraction
Jet Fire (Individual Radiation Criteria Zone)	1	fraction
Jet Fire (Societal Flammable Probit Zone)	1	fraction
Jet Fire (Individual Flammable Probit Zone)	1	fraction
Pool Fire (Societal Radiation Criteria Zone)	1	fraction
Pool Fire (Individual Radiation Criteria Zone)	1	fraction
Pool Fire (Societal Flammable Probit Zone)	1	fraction
Pool Fire (Individual Flammable Probit Zone)	1	fraction
Light Explosion Damage vulnerability	0	fraction
Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	9.8	kW/m2
Pool Fire Radiation Intensity Level (2)	19.5	kW/m2
Pool Fire Radiation Intensity Level (3)	35	kW/m2
Jet Fire Radiation Intensity Level (1)	9.8	kW/m2
Jet Fire Radiation Intensity Level (2)	19.5	kW/m2
Jet Fire Radiation Intensity Level (3)	35	kW/m2
Fire Ball Radiation Intensity Level (1)	9.8	kW/m2
Fire Ball Radiation Intensity Level (2)	19.5	kW/m2
Fire Ball Radiation Intensity Level (3)	35	kW/m2

Pool Fire Parameters

Instantaneous releases	10	s
Continuous releases	10	s
Calculate Dose	Not selected	
Calculate Probit	Not selected	
Calculate Lethality	Not selected	
MaxExposureDuration	20	s

Radiative fraction for general fires	0.4	fraction
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Pool Vaporization Parameters

Toxics cut-off rate for pool evaporation	0.001	kg/s
Flammable cut-off rate for pool evaporation	0.1	kg/s
Concentration power to use in pool rate load calculation	1	
Maximum number of pool evaporation rates	10.00	
Pool minimum thickness	5	mm
Surface thermal conductivity	0.00221	kJ/m.s.degK
Surface roughness factor	2.634	
Surface thermal diffusivity	9.48E-7	m2/s
Type of Bund Surface	Concrete	
Bund Height	0	m
Bund Failure Modeling	Bund cannot fail	

Toxic Parameters

Toxics: minimum probability of death	0.001	
Toxics: height for calculation of effects	0	m
Toxics: results grid step in Y-direction	2.5	m
Toxics: results grid step in X-direction	25	m
Multi-comp. toxic calc. method	Mixture Probit	
Toxic Averaging Time - New Parameter	600	s
Probit Calculation Method	Use Probit	
Building Exchange Rate	4	/hr
Tail Time	1800	s
Indoor Calculations	Unselected	
Wind Dependent Exchange Rate	Case Specified	
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

Weather Parameters

Atmospheric pressure	1.013	bar
Atmospheric molecular weight	28.97	
Atmospheric specific heat at constant pressure	1.004	kJ/kg.degK
Wind speed reference height	10	m
Temperature reference height	0	m
Cut-off height for wind speed profile	1	m
Wind speed profile	Power Law	
Atmospheric T and P Profile	Temp.Logarithmic; Pres.Linear	
Atmospheric Temperature	25	degC
Relative Humidity	0.8	fraction
Parameter	0.1	
Length	183.2	mm

Surface Roughness	Use Parameter	
Surface Temperature for Dispersion Calculations	25	degC
Surface Temperature for Pool Calculations	25	degC
Solar Radiation Flux	0.5	kW/m2
Building Exchange Rate	4	/hr
Tail Time	1800	s
Surface Type	User-defined	
Mixing Layer Height for Pasquil Stability A	1300	m
Mixing Layer Height for Pasquil Stability A/B	1080	m
Mixing Layer Height for Pasquil Stability B	920	m
Mixing Layer Height for Pasquil Stability B/C	880	m
Mixing Layer Height for Pasquil Stability C	840	m
Mixing Layer Height for Pasquil Stability C/D	820	m
Mixing Layer Height for Pasquil Stability D	800	m
Mixing Layer Height for Pasquil Stability E	400	m
Mixing Layer Height for Pasquil Stability F	100	m
Mixing Layer Height for Pasquil Stability G	100	m

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Parameters

Discharge Parameters

Continuous Critical Weber number	12.5	
Instantaneous Critical Weber number	12.5	
Venting equation constant	24.82	
Relief valve safety factor	1.2	
Minimum RV diameter ratio	1	
Critical pressure greater than flow phase	0.3447	bar
Maximum release velocity	500	m/s
Minimum drop diameter allowed	0.01	um
Maximum drop diameter allowed	1E4	um
Default Liquid Fraction	1	fraction
Continuous Drop Slip factor	1	
Instantaneous Drop Slip factor	1	
Number of Time Steps	100.00	
Maximum Number of Data Points	1,000.00	
Tolerance	0.0001	
Thermal coupling to the wall	No modelling of heat transfer	
Use Bernoulli for forced -phase liq-liq discharge	Use compressible flow eqn	
Capping of pipe flow rates	Use leak scenario cap, disallow flashing	
Velocity capping method	FixedVelocity	
Droplet Method - continuous only	Modified CCPS	
Thermodynamic Option for Gas Pipellines	Non-ideal Gas	
Excess Flow Valve velocity head losses	0	
Non-Return Valve velocity head losses	0	
Shut-Off Valve velocity head losses	0	
Frequency of bends in long pipes	0	/m
Frequency of couplings in long pipes	0	/m
Frequency of junctions in long pipes	0	/m
Line length	10	m
Pipe roughness	0.0457	mm
Air changes	3	/hr
Elevation	1	m
Atmospheric Expansion Method	Closest to Initial Conditions	
Tank Roof Failure Model Effects	Instantaneous effects	
Frequency of Excess Flow Valves	0	/m
Frequency of Non-Return Valves	0	/m
Frequency of Shut-Off Valves	0	/m
Mechanism for forcing droplet breakup - Inst.	Use flashing correlation	
Mechanism for forcing droplet breakup - Cont	Do not force correlation	
Flashing in the orifice	No flashing in the orifice	
Handling of droplets	Not Trapped	
Indoor mass modification factor	3	
Vacuum Relief Valve	Operating	
Vacuum Relief Valve Set Point	0	bar

Dispersion Parameters

Expansion zone length/source diameter ratio	0.01	
Near Field Passive Entrainment Parameter	1	
Jet Model	Morton et.al.	
Jet entrainment coefficient alpha1	0.17	
Jet entrainment coefficient alpha2	0.35	

Drag coefficient between plume and air	0	
Dense cloud parameter gamma - continuous	0	
Dense cloud parameter gamma - instant	0.3	
Dense cloud parameter K - continuous	1.15	
Dense cloud parameter K - instantaneous	1.15	
Modeling of instantaneous expansion	Standard Method	
Maximum Cloud/Ambient Velocity Difference	0.1	
Maximum Cloud/Ambient Density Difference	0.015	
Maximum Non-passive entrainment fraction	0.3	
Maximum Richardson number	15	
Distance multiple for full passive entrainment	2	
Core Averaging Time	18.75	s
Ratio instantaneous/continuous sigma-y	1	
Ratio instantaneous/continuous sigma-z	1	
Droplet evaporation thermodynamics model	Rainout, Non-equilibrium	
Ratio Droplet/ expansion velocity for inst. release	0.8	
Expansion energy cutoff for droplet angle	0.69	kJ/kg
Coefficient of Initial Rainout	0	
Flag to reset rainout position	Do not reset rainout position	
Richardson Number for passive transition above pool	0.015	
Pool Vaporization entrainment parameter	1.5	
Richardson number criterion for cloud lift-off	-20	
Flag for Heat/Water vapor transfer	Heat and Water	
Surface over which the dispersion occurs	Land	
Minimum temperature allowed	-262.1	degC
Maximum temperature allowed	626.9	degC
Minimum release velocity for cont. release	0.1	m/s
Minimum Continuous Release Height	0	m
Maximum distance for dispersion	5E4	m
Maximum height for dispersion	1000	m
Minimum cloud depth	0.02	m
Treatment of top mixing layer	Constrained	
Model In Use	Best Estimate	
Lee Length	Calculate	
Lee Half-Width	Calculate	
Lee Height	Calculate	
K-Factor	Calculate	
Switch Distance	Calculate	
Maximum Initial Step Size	10	m
Minimum Number of Steps per Zone	5.00	
Factor for Step Increase	1.2	
Maximum Number of Output Steps	1,000.00	
Flag for finite duration correction	QI without Duration Adjustment	
Quasi-instantaneous transition parameter	0.8	
Relative tolerance for dispersion calculations	0.001	
Relative tolerance for droplet calculations	0.001	
Initial integration step size - Instantaneous	0.01	s
Initial integration step size - Continuous	0.01	m
Maximum integration step size - Instantaneous	100	s
Maximum integration step size - Continuous	100	m
Criterion for halting dispersion model	Risk based	
Impingement Option	Use Velocity Modification Factor	
Impinged velocity limit	500	m/s
Impinged Velocity Factor	0.25	
Dispersion Model to use	Version 2 model	

Fixed step size - Instantaneous	0.01	s
Fixed step size - Continuous	0.1	m
Number of fixed size output steps	20.00	
Multiplier for output step sizes	1.2	

Event Tree Probabilities

Probability of a BLEVE	1	fraction
Probability of a Pool Fire	1	fraction
Toxic Probability	1	fraction
Continuous no Rainout Immediate Ignition	0.3	fraction
Continuous no Rainout Long Duration Horizontal Fraction	0.6	fraction
Continuous no Rainout Long Duration Horizontal Jet Fire	1	fraction
Continuous no Rainout Long Duration Vertical Jet Fire	1	fraction
Continuous no Rainout Short Duration Fraction	1	fraction
Continuous no Rainout Short Duration BLEVE	1	fraction
Continuous no Rainout Short Duration Flash Fire	0	fraction
Continuous no Rainout Short Duration Explosion	0	fraction
Continuous no Rainout Delayed Ignition Flash Fire	0.6	fraction
Continuous no Rainout Delayed Ignition Explosion	0.4	fraction
Continuous with Rainout Immediate Ignition	0.3	fraction
Continuous with Rainout Long Duration Horizontal Fraction	0.6	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Pool Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire with Pool Fire	1	fraction
Continuous with Rainout Long Duration Vertical Pool Fire	0	fraction
Continuous with Rainout Long Duration Vertical Jet Fire	0	fraction
Continuous with Rainout Short Duration Fraction	1	fraction
Continuous with Rainout Long Duration Vertical Jet Fire with Pool Fire	1	fraction
Continuous with Rainout Short Duration BLEVE with Pool Fire	1	fraction
Continuous with Rainout Short Duration BLEVE alone	0	fraction
Continuous with Rainout Short Duration Flash Fire with Pool Fire	0	fraction
Continuous with Rainout Short Duration Flash Fire Alone	0	fraction
Continuous with Rainout Short Duration Explosion with Pool Fire	0	fraction
Continuous with Rainout Short Duration Explosion Alone	0	fraction
Continuous with Rainout Short Duration Pool Fire	0	fraction
Continuous with Rainout Residual Pool Fire	0.15	fraction
Continuous with Rainout Delayed Ignition Flash Fire	0.6	fraction
Continuous with Rainout Delayed Ignition Explosion	0.4	fraction
Instantaneous no Rainout Immediate Ignition	0.3	fraction
Instantaneous no Rainout BLEVE	1	fraction
Instantaneous no Rainout Immediate Flash Fire	0	fraction
Instantaneous no Rainout Immediate Explosion	0	fraction
Instantaneous no Rainout Delayed Ignition Flash Fire	0.6	fraction
Instantaneous no Rainout Delayed Ignition Explosion	0.4	fraction
Instantaneous with Rainout Immediate Ignition	0.3	fraction
Instantaneous with Rainout BLEVE with Pool Fire	1	fraction
Instantaneous with Rainout BLEVE Alone	0	fraction
Instantaneous with Rainout Immediate Flash Fire with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Flash Fire Alone	0	fraction
Instantaneous with Rainout Immediate Explosion with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Explosion Alone	0	fraction
Instantaneous with Rainout Immediate Pool Fire Alone	0	fraction
Instantaneous with Rainout Residual Pool Fire	0.15	fraction
Instantaneous with Rainout Delayed Ignition Flash Fire	0.6	fraction
Instantaneous with Rainout Delayed Ignition Explosion	0.4	fraction

Immediate Ignition	0.1	fraction
Explosion Given Ignition	0.5	fraction
Long Duration Jet Fire	0.5	fraction
Short Duration Any Ignition of Cloud	0.5	fraction
Short Duration Ignition of Cloud with Pool Fire	0	fraction
Long Duration Horizontal Jet Fire with Pool	0	fraction
Long Duration Vertical Jet Fire with Pool	0	fraction
Short Duration Fraction for Effects	0	fraction
Short Duration BLEVE not Flash Fire	0.5	fraction
Volume based explosion probabilities	No	
FlamespeedLowMedium	0.45	m/s
FlamespeedMediumHigh	0.75	m/s
Obstructed Cloud Volume (1)	200	m3
Obstructed Cloud Volume (2)	3000	m3
Obstructed Cloud Volume (3)	6000	m3
Low Flame Speed Probability (1)	0	fraction
Low Flame Speed Probability (2)	0.3	fraction
Low Flame Speed Probability (3)	0.6	fraction
Medium Flame Speed Probability (1)	0.3	fraction
Medium Flame Speed Probability (2)	0.6	fraction
Medium Flame Speed Probability (3)	0.9	fraction
High Flame Speed Probability (1)	0.6	fraction
High Flame Speed Probability (2)	0.9	fraction
High Flame Speed Probability (3)	1	fraction

Explosion Parameters

Over Pressure Level 1	0.02068	bar
Over Pressure Level 2	0.1379	bar
Over Pressure Level 3	0.2068	bar
Explosion Location Criterion	Cloud Front (LFL Fraction)	
Minimum explosive mass	0	kg
Minimum Explosion Energy	5E6	kJ
Explosion Efficiency	0.1	fraction
Coefficient for zone of heavy damage	0.03	
Coefficient for zone of light damage	0.06	
Explosion efficiency	10	%
Air or Ground burst	Air burst	
Explosion Mass Modification Factor	3	
Use of mass modification factor	Early and late explosions	

Fireball and BLEVE Blast Parameters

Maximum surface emissive power	400	kW/m2
Radiation Dose for Fireball risk calculations	5.784E6	
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	
TNO model flame temperature	1727	degC
Mass Modification Factor	3	
Calculation method for fireball	DNV Recommended	
Fireball Maximum Exposure Duration	20	s
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	

Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	

Flammable Parameters

Height for calculation of flammable effects	0	m
Flammable result grid step in X-direction	10	m
LFL fraction to finish	1	
Angle of inclination	0	deg
Observer direction	Variable	
Flammable mass calculation method	Mass between LFL and UFL	
Flammable Base averaging time	18.75	s
Radiation level for Jet/Pool Fire Risk	35	kW/m2
Cut Off fraction for cloud volume	0.001	fraction
UFL Multiple for immediate ignition	1	
Cut Off Time for Short Continuous Releases	20	s
Observer type radiation modelling flag	Planar	
Probit A Value	-36.38	
Probit B Value	2.56	
Probit N Value	1.333	
Height for reports	Centreline Height	
Angle of orientation	0	deg
Relative tolerance for radiation calculations	0.01	fraction
Number of Lethality Ellipses	5.00	
Ellipse linear spacing variable	Probit	
Minimum Probability Of Death	0.01	fraction
Number of radiation/distance points in linked radiation calculations	50.00	
Method for fitting ellipse to flash fire shape	ChiSq method	
Absolute tolerance for linked radiation calcs	1e-010	
Solar radiation	Exclude from calculations	
For time-varying releases	Don't Model Short Duration Effects	
Match fireball duration and mass released	No	

General Parameters

Maximum release duration	3600	s
Height for concentration output	0	m
Rotation	0	deg
Lower Elevation	0	m
Multicomponent aerosol behaviour	Single aerosol modelling	

General Risk Parameters

Use Free Field Modelling	No Free Field	
Distance to Site Boundary	0	m
Late Pool Fire	Exclude Effects	
Minimum Case Frequency	1e-012	/AvgeYear
Minimum Event Probability	1e-012	
Population Omega Factor	0	
Maximum Number of Subsquares across Ellipse	10.00	
Maximum Number of Subdivisions per Square	1.00	
Factor for Toxic F-N Spread	2	
Grid Sizing	Calculated	
Grid Bounds Minimum X	-1000	m
Grid Bounds Maximum X	1000	m
Grid Bounds Minimum Y	-1000	m
Grid Bounds Maximum Y	1000	m
Grid Calculation Method	Number of cells	
Grid cell size	10	m
Maximum number of cells	40,000.00	
Aversion Index	1.2	
Indoor Population Omega Factor	0	
Number of wind subdivisions per sector	1.00	
Method for handling Indoor/Outdoor risk	Indoor and outdoor risk calculations	
Inter-ellipse interpolation method	Weighted	
Method option	Normal dispersion	
Cylinder height over radius ratio	3	
Building damage method	Worst point	
Reflection method	Calculated Angle	
Number of X steps per view	11.00	
Minimum X step	0.1	m
Number of time steps - continuous clouds	5.00	
Between Cloud Views	Minimise Gaps	
Pressure exceedance curves	Calculate	
Elevation of Floor or Ceiling	0	m
Concentration method for filling	Stoichiometric	
Minimum probability of death for explosions	0.001	
Minimum Pressure Filter	0.01	bar
Separation specification	Use Ratio	
Critical Separation Ratio	0.5	
Cloud Shape of Area Integration	Elliptical	
Explosion efficiency method	100% efficiency	
Explosion Type Calculation Method	Polynomial Curve-Fit Equations	
Number of Blast Curve Discretization Points	30,000.00	
Maximum No. effect points along transect	2.00	
Low to medium criterion	0.006	
Medium to high criterion	0.08	
Options available	Volume Averaged	
Method option:	Ground reflection	
Reflection factor	1	
Unconfined Explosion Strength	2	
Explosion Efficiency	1	fraction
Flammable Mass Calculation Type	Area Weighted Mass Integral	
Minimum Explosion Energy	0	kJ
Maximum number of time steps	100.00	
Number of timesteps - time varying clouds	10.00	
Active Shut Down	No Shut Down	

Fraction of Population Indoors for Societal Risk	0.9	fraction
Fraction of Population Indoors for Individual Risk	0	fraction

Indoor Vulnerability

Vulnerability Model	Discrete Overpressure	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.1	bar
Overpressure for Lethality (2)	0.3	bar
Lethality (1)	0.025	fraction
Lethality (2)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	-10.46	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	2.00	
Number of impulses	1.00	
Pool Fire Radiation Soc Vulnerabilities (1)	0.001	fraction
Pool Fire Radiation Soc Vulnerabilities (2)	0.05	fraction
Pool Fire Radiation Soc Vulnerabilities (3)	0.099	fraction
Pool Fire Radiation Ind Vulnerabilities (1)	0.001	fraction
Pool Fire Radiation Ind Vulnerabilities (2)	0.05	fraction
Pool Fire Radiation Ind Vulnerabilities (3)	0.099	fraction
Fire Ball Radiation Soc Vulnerabilities (1)	0.001	fraction
Fire Ball Radiation Soc Vulnerabilities (2)	0.05	fraction
Fire Ball Radiation Soc Vulnerabilities (3)	0.099	fraction
Fire Ball Radiation Ind Vulnerabilities (1)	0.001	fraction
Fire Ball Radiation Ind Vulnerabilities (2)	0.05	fraction
Fire Ball Radiation Ind Vulnerabilities (3)	0.099	fraction
Jet Fire Radiation Soc Vulnerabilities (1)	0.001	fraction
Jet Fire Radiation Soc Vulnerabilities (2)	0.05	fraction
Jet Fire Radiation Soc Vulnerabilities (3)	0.099	fraction
Jet Fire Radiation Ind Vulnerabilities (1)	0.001	fraction
Jet Fire Radiation Ind Vulnerabilities (2)	0.05	fraction
Jet Fire Radiation Ind Vulnerabilities (3)	0.099	fraction
Exposure time required for damage from Pool Fire	20	s
Exposure time required for damage from Jet Fire	20	s
Fireball (Societal Radiation Criteria Zone)	0.1	fraction
Fireball (Individual Radiation Criteria Zone)	0.1	fraction
Fireball (Societal Flammable Probit Zone)	0.1	fraction
Fireball (Individual Flammable Probit Zone)	0.1	fraction
Jet Fire (Societal Radiation Criteria Zone)	0.1	fraction
Jet Fire (Individual Radiation Criteria Zone)	0.1	fraction
Jet Fire (Societal Flammable Probit Zone)	0.1	fraction
Jet Fire (Individual Flammable Probit Zone)	0.1	fraction
Pool Fire (Societal Radiation Criteria Zone)	0.1	fraction
Pool Fire (Individual Radiation Criteria Zone)	0.1	fraction
Pool Fire (Societal Flammable Probit Zone)	0.1	fraction
Pool Fire (Individual Flammable Probit Zone)	0.1	fraction
Light Explosion Damage vulnerability	0.025	fraction

Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	9.8	kW/m2
Pool Fire Radiation Intensity Level (2)	19.5	kW/m2
Pool Fire Radiation Intensity Level (3)	35	kW/m2
Jet Fire Radiation Intensity Level (1)	9.8	kW/m2
Jet Fire Radiation Intensity Level (2)	19.5	kW/m2
Jet Fire Radiation Intensity Level (3)	35	kW/m2
Fire Ball Radiation Intensity Level (1)	9.8	kW/m2
Fire Ball Radiation Intensity Level (2)	19.5	kW/m2
Fire Ball Radiation Intensity Level (3)	35	kW/m2

Jet Fire Parameters

Maximum SEP for a Jet Fire	400	kW/m2
Jet Fire Averaging Time	20	s
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	
Crosswind Angle	0	deg
Correlation	DNV Recommended	
Horizontal Options	Use standard method	
Rate Modification Factor	3	
Jet Fire Maximum Exposure Duration	20	s
Emissivity Method	E and F calculated	
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Outdoor Vulnerability

Vulnerability Model	Overpressure Probit Method	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.3	bar
Lethality (1)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	1.47	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	1.00	

Number of impulses	1.00	
Pool Fire Radiation Soc Vulnerabilities (1)	0.01	fraction
Pool Fire Radiation Soc Vulnerabilities (2)	0.5	fraction
Pool Fire Radiation Soc Vulnerabilities (3)	0.99	fraction
Pool Fire Radiation Ind Vulnerabilities (1)	0.01	fraction
Pool Fire Radiation Ind Vulnerabilities (2)	0.5	fraction
Pool Fire Radiation Ind Vulnerabilities (3)	0.99	fraction
Fire Ball Radiation Soc Vulnerabilities (1)	0.01	fraction
Fire Ball Radiation Soc Vulnerabilities (2)	0.5	fraction
Fire Ball Radiation Soc Vulnerabilities (3)	0.99	fraction
Fire Ball Radiation Ind Vulnerabilities (1)	0.01	fraction
Fire Ball Radiation Ind Vulnerabilities (2)	0.5	fraction
Fire Ball Radiation Ind Vulnerabilities (3)	0.99	fraction
Jet Fire Radiation Soc Vulnerabilities (1)	0.01	fraction
Jet Fire Radiation Soc Vulnerabilities (2)	0.5	fraction
Jet Fire Radiation Soc Vulnerabilities (3)	0.99	fraction
Jet Fire Radiation Ind Vulnerabilities (1)	0.01	fraction
Jet Fire Radiation Ind Vulnerabilities (2)	0.5	fraction
Jet Fire Radiation Ind Vulnerabilities (3)	0.99	fraction
Exposure time required for damage from Pool Fire	20	s
Exposure time required for damage from Jet Fire	20	s
Fireball (Societal Radiation Criteria Zone)	1	fraction
Fireball (Individual Radiation Criteria Zone)	1	fraction
Fireball (Societal Flammable Probit Zone)	1	fraction
Fireball (Individual Flammable Probit Zone)	1	fraction
Jet Fire (Societal Radiation Criteria Zone)	1	fraction
Jet Fire (Individual Radiation Criteria Zone)	1	fraction
Jet Fire (Societal Flammable Probit Zone)	1	fraction
Jet Fire (Individual Flammable Probit Zone)	1	fraction
Pool Fire (Societal Radiation Criteria Zone)	1	fraction
Pool Fire (Individual Radiation Criteria Zone)	1	fraction
Pool Fire (Societal Flammable Probit Zone)	1	fraction
Pool Fire (Individual Flammable Probit Zone)	1	fraction
Light Explosion Damage vulnerability	0	fraction
Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	9.8	kW/m2
Pool Fire Radiation Intensity Level (2)	19.5	kW/m2
Pool Fire Radiation Intensity Level (3)	35	kW/m2
Jet Fire Radiation Intensity Level (1)	9.8	kW/m2
Jet Fire Radiation Intensity Level (2)	19.5	kW/m2
Jet Fire Radiation Intensity Level (3)	35	kW/m2
Fire Ball Radiation Intensity Level (1)	9.8	kW/m2
Fire Ball Radiation Intensity Level (2)	19.5	kW/m2
Fire Ball Radiation Intensity Level (3)	35	kW/m2

Pool Fire Parameters

Instantaneous releases	10	s
Continuous releases	10	s
Calculate Dose	Not selected	
Calculate Probit	Not selected	
Calculate Lethality	Not selected	
MaxExposureDuration	20	s

Radiative fraction for general fires	0.4	fraction
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Pool Vaporization Parameters

Toxics cut-off rate for pool evaporation	0.001	kg/s
Flammable cut-off rate for pool evaporation	0.1	kg/s
Concentration power to use in pool rate load calculation	1	
Maximum number of pool evaporation rates	10.00	
Pool minimum thickness	5	mm
Surface thermal conductivity	0.00221	kJ/m.s.degK
Surface roughness factor	2.634	
Surface thermal diffusivity	9.48E-7	m2/s
Type of Bund Surface	Concrete	
Bund Height	0	m
Bund Failure Modeling	Bund cannot fail	

Toxic Parameters

Toxics: minimum probability of death	0.001	
Toxics: height for calculation of effects	0	m
Toxics: results grid step in Y-direction	2.5	m
Toxics: results grid step in X-direction	25	m
Multi-comp. toxic calc. method	Mixture Probit	
Toxic Averaging Time - New Parameter	600	s
Probit Calculation Method	Use Probit	
Building Exchange Rate	4	/hr
Tail Time	1800	s
Indoor Calculations	Unselected	
Wind Dependent Exchange Rate	Case Specified	
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

Weather Parameters

Atmospheric pressure	1.013	bar
Atmospheric molecular weight	28.97	
Atmospheric specific heat at constant pressure	1.004	kJ/kg.degK
Wind speed reference height	10	m
Temperature reference height	0	m
Cut-off height for wind speed profile	1	m
Wind speed profile	Power Law	
Atmospheric T and P Profile	Temp.Logarithmic; Pres.Linear	
Atmospheric Temperature	25	degC
Relative Humidity	0.8	fraction
Parameter	0.1	
Length	183.2	mm

Surface Roughness	Use Parameter	
Surface Temperature for Dispersion Calculations	25	degC
Surface Temperature for Pool Calculations	25	degC
Solar Radiation Flux	0.5	kW/m2
Building Exchange Rate	4	/hr
Tail Time	1800	s
Surface Type	User-defined	
Mixing Layer Height for Pasquil Stability A	1300	m
Mixing Layer Height for Pasquil Stability A/B	1080	m
Mixing Layer Height for Pasquil Stability B	920	m
Mixing Layer Height for Pasquil Stability B/C	880	m
Mixing Layer Height for Pasquil Stability C	840	m
Mixing Layer Height for Pasquil Stability C/D	820	m
Mixing Layer Height for Pasquil Stability D	800	m
Mixing Layer Height for Pasquil Stability E	400	m
Mixing Layer Height for Pasquil Stability F	100	m
Mixing Layer Height for Pasquil Stability G	100	m

Tai Po Project 26Nov21 TGS Test (RunRow NG

Parameters

Discharge Parameters

Continuous Critical Weber number	12.5	
Instantaneous Critical Weber number	12.5	
Venting equation constant	24.82	
Relief valve safety factor	1.2	
Minimum RV diameter ratio	1	
Critical pressure greater than flow phase	0.3447	bar
Maximum release velocity	500	m/s
Minimum drop diameter allowed	0.01	um
Maximum drop diameter allowed	1E4	um
Default Liquid Fraction	1	fraction
Continuous Drop Slip factor	1	
Instantaneous Drop Slip factor	1	
Number of Time Steps	100.00	
Maximum Number of Data Points	1,000.00	
Tolerance	0.0001	
Thermal coupling to the wall	No modelling of heat transfer	
Use Bernoulli for forced -phase liq-liq discharge	Use compressible flow eqn	
Capping of pipe flow rates	Use leak scenario cap, disallow flashing	
Velocity capping method	FixedVelocity	
Droplet Method - continuous only	Modified CCPS	
Thermodynamic Option for Gas Pipellines	Non-ideal Gas	
Excess Flow Valve velocity head losses	0	
Non-Return Valve velocity head losses	0	
Shut-Off Valve velocity head losses	0	
Frequency of bends in long pipes	0	/m
Frequency of couplings in long pipes	0	/m
Frequency of junctions in long pipes	0	/m
Line length	10	m
Pipe roughness	0.0457	mm
Air changes	3	/hr
Elevation	1	m
Atmospheric Expansion Method	Closest to Initial Conditions	
Tank Roof Failure Model Effects	Instantaneous effects	
Frequency of Excess Flow Valves	0	/m
Frequency of Non-Return Valves	0	/m
Frequency of Shut-Off Valves	0	/m
Mechanism for forcing droplet breakup - Inst.	Use flashing correlation	
Mechanism for forcing droplet breakup - Cont	Do not force correlation	
Flashing in the orifice	No flashing in the orifice	
Handling of droplets	Not Trapped	
Indoor mass modification factor	3	
Vacuum Relief Valve	Operating	
Vacuum Relief Valve Set Point	0	bar

Dispersion Parameters

Expansion zone length/source diameter ratio	0.01	
Near Field Passive Entrainment Parameter	1	
Jet Model	Morton et.al.	
Jet entrainment coefficient alpha1	0.17	
Jet entrainment coefficient alpha2	0.35	

Drag coefficient between plume and air	0	
Dense cloud parameter gamma - continuous	0	
Dense cloud parameter gamma - instant	0.3	
Dense cloud parameter K - continuous	1.15	
Dense cloud parameter K - instantaneous	1.15	
Modeling of instantaneous expansion	Standard Method	
Maximum Cloud/Ambient Velocity Difference	0.1	
Maximum Cloud/Ambient Density Difference	0.015	
Maximum Non-passive entrainment fraction	0.3	
Maximum Richardson number	15	
Distance multiple for full passive entrainment	2	
Core Averaging Time	18.75	s
Ratio instantaneous/continuous sigma-y	1	
Ratio instantaneous/continuous sigma-z	1	
Droplet evaporation thermodynamics model	Rainout, Non-equilibrium	
Ratio Droplet/ expansion velocity for inst. release	0.8	
Expansion energy cutoff for droplet angle	0.69	kJ/kg
Coefficient of Initial Rainout	0	
Flag to reset rainout position	Do not reset rainout position	
Richardson Number for passive transition above pool	0.015	
Pool Vaporization entrainment parameter	1.5	
Richardson number criterion for cloud lift-off	-20	
Flag for Heat/Water vapor transfer	Heat and Water	
Surface over which the dispersion occurs	Land	
Minimum temperature allowed	-262.1	degC
Maximum temperature allowed	626.9	degC
Minimum release velocity for cont. release	0.1	m/s
Minimum Continuous Release Height	0	m
Maximum distance for dispersion	5E4	m
Maximum height for dispersion	1000	m
Minimum cloud depth	0.02	m
Treatment of top mixing layer	Constrained	
Model In Use	Best Estimate	
Lee Length	Calculate	
Lee Half-Width	Calculate	
Lee Height	Calculate	
K-Factor	Calculate	
Switch Distance	Calculate	
Maximum Initial Step Size	10	m
Minimum Number of Steps per Zone	5.00	
Factor for Step Increase	1.2	
Maximum Number of Output Steps	1,000.00	
Flag for finite duration correction	QI without Duration Adjustment	
Quasi-instantaneous transition parameter	0.8	
Relative tolerance for dispersion calculations	0.001	
Relative tolerance for droplet calculations	0.001	
Initial integration step size - Instantaneous	0.01	s
Initial integration step size - Continuous	0.01	m
Maximum integration step size - Instantaneous	100	s
Maximum integration step size - Continuous	100	m
Criterion for halting dispersion model	Risk based	
Impingement Option	Use Velocity Modification Factor	
Impinged velocity limit	500	m/s
Impinged Velocity Factor	0.25	
Dispersion Model to use	Version 2 model	

Fixed step size - Instantaneous	0.01	s
Fixed step size - Continuous	0.1	m
Number of fixed size output steps	20.00	
Multiplier for output step sizes	1.2	

Event Tree Probabilities

Probability of a BLEVE	1	fraction
Probability of a Pool Fire	1	fraction
Toxic Probability	1	fraction
Continuous no Rainout Immediate Ignition	0.3	fraction
Continuous no Rainout Long Duration Horizontal Fraction	0.5	fraction
Continuous no Rainout Long Duration Horizontal Jet Fire	0.5	fraction
Continuous no Rainout Long Duration Vertical Jet Fire	0.5	fraction
Continuous no Rainout Short Duration Fraction	1	fraction
Continuous no Rainout Short Duration BLEVE	1	fraction
Continuous no Rainout Short Duration Flash Fire	0	fraction
Continuous no Rainout Short Duration Explosion	0	fraction
Continuous no Rainout Delayed Ignition Flash Fire	0.6	fraction
Continuous no Rainout Delayed Ignition Explosion	0.4	fraction
Continuous with Rainout Immediate Ignition	0.3	fraction
Continuous with Rainout Long Duration Horizontal Fraction	0.6	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Pool Fire	0	fraction
Continuous with Rainout Long Duration Horizontal Jet Fire with Pool Fire	1	fraction
Continuous with Rainout Long Duration Vertical Pool Fire	0	fraction
Continuous with Rainout Long Duration Vertical Jet Fire	0	fraction
Continuous with Rainout Short Duration Fraction	1	fraction
Continuous with Rainout Long Duration Vertical Jet Fire with Pool Fire	1	fraction
Continuous with Rainout Short Duration BLEVE with Pool Fire	1	fraction
Continuous with Rainout Short Duration BLEVE alone	0	fraction
Continuous with Rainout Short Duration Flash Fire with Pool Fire	0	fraction
Continuous with Rainout Short Duration Flash Fire Alone	0	fraction
Continuous with Rainout Short Duration Explosion with Pool Fire	0	fraction
Continuous with Rainout Short Duration Explosion Alone	0	fraction
Continuous with Rainout Short Duration Pool Fire	0	fraction
Continuous with Rainout Residual Pool Fire	0.15	fraction
Continuous with Rainout Delayed Ignition Flash Fire	0.6	fraction
Continuous with Rainout Delayed Ignition Explosion	0.4	fraction
Instantaneous no Rainout Immediate Ignition	0.3	fraction
Instantaneous no Rainout BLEVE	1	fraction
Instantaneous no Rainout Immediate Flash Fire	0	fraction
Instantaneous no Rainout Immediate Explosion	0	fraction
Instantaneous no Rainout Delayed Ignition Flash Fire	0.6	fraction
Instantaneous no Rainout Delayed Ignition Explosion	0.4	fraction
Instantaneous with Rainout Immediate Ignition	0.3	fraction
Instantaneous with Rainout BLEVE with Pool Fire	1	fraction
Instantaneous with Rainout BLEVE Alone	0	fraction
Instantaneous with Rainout Immediate Flash Fire with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Flash Fire Alone	0	fraction
Instantaneous with Rainout Immediate Explosion with Pool Fire	0	fraction
Instantaneous with Rainout Immediate Explosion Alone	0	fraction
Instantaneous with Rainout Immediate Pool Fire Alone	0	fraction
Instantaneous with Rainout Residual Pool Fire	0.15	fraction
Instantaneous with Rainout Delayed Ignition Flash Fire	0.6	fraction
Instantaneous with Rainout Delayed Ignition Explosion	0.4	fraction

Immediate Ignition	0.1	fraction
Explosion Given Ignition	0.5	fraction
Long Duration Jet Fire	0.5	fraction
Short Duration Any Ignition of Cloud	0.5	fraction
Short Duration Ignition of Cloud with Pool Fire	0	fraction
Long Duration Horizontal Jet Fire with Pool	0	fraction
Long Duration Vertical Jet Fire with Pool	0	fraction
Short Duration Fraction for Effects	0	fraction
Short Duration BLEVE not Flash Fire	0.5	fraction
Volume based explosion probabilities	No	
FlamespeedLowMedium	0.45	m/s
FlamespeedMediumHigh	0.75	m/s
Obstructed Cloud Volume (1)	200	m3
Obstructed Cloud Volume (2)	3000	m3
Obstructed Cloud Volume (3)	6000	m3
Low Flame Speed Probability (1)	0	fraction
Low Flame Speed Probability (2)	0.3	fraction
Low Flame Speed Probability (3)	0.6	fraction
Medium Flame Speed Probability (1)	0.3	fraction
Medium Flame Speed Probability (2)	0.6	fraction
Medium Flame Speed Probability (3)	0.9	fraction
High Flame Speed Probability (1)	0.6	fraction
High Flame Speed Probability (2)	0.9	fraction
High Flame Speed Probability (3)	1	fraction

Explosion Parameters

Over Pressure Level 1	0.02068	bar
Over Pressure Level 2	0.1379	bar
Over Pressure Level 3	0.2068	bar
Explosion Location Criterion	Cloud Front (LFL Fraction)	
Minimum explosive mass	0	kg
Minimum Explosion Energy	5E6	kJ
Explosion Efficiency	0.1	fraction
Coefficient for zone of heavy damage	0.03	
Coefficient for zone of light damage	0.06	
Explosion efficiency	10	%
Air or Ground burst	Air burst	
Explosion Mass Modification Factor	3	
Use of mass modification factor	Early and late explosions	

Fireball and BLEVE Blast Parameters

Maximum surface emissive power	400	kW/m2
Radiation Dose for Fireball risk calculations	5.784E6	
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	
TNO model flame temperature	1727	degC
Mass Modification Factor	3	
Calculation method for fireball	DNV Recommended	
Fireball Maximum Exposure Duration	20	s
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	

Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	
Ground Reflection	Ground Burst	
Ideal Gas Modeling	Model as real gas	
Minimum Distance	0	m
Number of Distance Points	100.00	

Flammable Parameters

Height for calculation of flammable effects	0	m
Flammable result grid step in X-direction	10	m
LFL fraction to finish	1	
Angle of inclination	0	deg
Observer direction	Variable	
Flammable mass calculation method	Mass between LFL and UFL	
Flammable Base averaging time	18.75	s
Radiation level for Jet/Pool Fire Risk	35	kW/m2
Cut Off fraction for cloud volume	0.001	fraction
UFL Multiple for immediate ignition	1	
Cut Off Time for Short Continuous Releases	20	s
Observer type radiation modelling flag	Planar	
Probit A Value	-36.38	
Probit B Value	2.56	
Probit N Value	1.333	
Height for reports	Centreline Height	
Angle of orientation	0	deg
Relative tolerance for radiation calculations	0.01	fraction
Number of Lethality Ellipses	5.00	
Ellipse linear spacing variable	Probit	
Minimum Probability Of Death	0.01	fraction
Number of radiation/distance points in linked radiation calculations	50.00	
Method for fitting ellipse to flash fire shape	ChiSq method	
Absolute tolerance for linked radiation calcs	1e-010	
Solar radiation	Exclude from calculations	
For time-varying releases	Don't Model Short Duration Effects	
Match fireball duration and mass released	No	

General Parameters

Maximum release duration	3600	s
Height for concentration output	0	m
Rotation	0	deg
Lower Elevation	0	m
Multicomponent aerosol behaviour	Single aerosol modelling	

General Risk Parameters

Use Free Field Modelling	No Free Field	
Distance to Site Boundary	0	m
Late Pool Fire	Exclude Effects	
Minimum Case Frequency	1e-012	/AvgeYear
Minimum Event Probability	1e-012	
Population Omega Factor	0	
Maximum Number of Subsquares across Ellipse	10.00	
Maximum Number of Subdivisions per Square	1.00	
Factor for Toxic F-N Spread	2	
Grid Sizing	Calculated	
Grid Bounds Minimum X	-330	m
Grid Bounds Maximum X	1177	m
Grid Bounds Minimum Y	-650	m
Grid Bounds Maximum Y	678	m
Grid Calculation Method	Number of cells	
Grid cell size	10	m
Maximum number of cells	40,000.00	
Aversion Index	1.2	
Indoor Population Omega Factor	0	
Number of wind subdivisions per sector	1.00	
Method for handling Indoor/Outdoor risk	Indoor and outdoor risk calculations	
Inter-ellipse interpolation method	Weighted	
Method option	Normal dispersion	
Cylinder height over radius ratio	3	
Building damage method	Worst point	
Reflection method	Calculated Angle	
Number of X steps per view	11.00	
Minimum X step	0.1	m
Number of time steps - continuous clouds	5.00	
Between Cloud Views	Minimise Gaps	
Pressure exceedance curves	Calculate	
Elevation of Floor or Ceiling	0	m
Concentration method for filling	Stoichiometric	
Minimum probability of death for explosions	0.001	
Minimum Pressure Filter	0.01	bar
Separation specification	Use Ratio	
Critical Separation Ratio	0.5	
Cloud Shape of Area Integration	Elliptical	
Explosion efficiency method	100% efficiency	
Explosion Type Calculation Method	Polynomial Curve-Fit Equations	
Number of Blast Curve Discretization Points	30,000.00	
Maximum No. effect points along transect	2.00	
Low to medium criterion	0.006	
Medium to high criterion	0.08	
Options available	Volume Averaged	
Method option:	Ground reflection	
Reflection factor	1	
Unconfined Explosion Strength	2	
Explosion Efficiency	1	fraction
Flammable Mass Calculation Type	Area Weighted Mass Integral	
Minimum Explosion Energy	0	kJ
Maximum number of time steps	100.00	
Number of timesteps - time varying clouds	10.00	
Active Shut Down	No Shut Down	

Fraction of Population Indoors for Societal Risk	0.9	fraction
Fraction of Population Indoors for Individual Risk	0	fraction

Indoor Vulnerability

Vulnerability Model	Discrete Overpressure	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.1	bar
Overpressure for Lethality (2)	0.3	bar
Lethality (1)	0.025	fraction
Lethality (2)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	-10.46	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	2.00	
Number of impulses	1.00	
Pool Fire Radiation Soc Vulnerabilities (1)	0.001	fraction
Pool Fire Radiation Soc Vulnerabilities (2)	0.05	fraction
Pool Fire Radiation Soc Vulnerabilities (3)	0.099	fraction
Pool Fire Radiation Ind Vulnerabilities (1)	0.001	fraction
Pool Fire Radiation Ind Vulnerabilities (2)	0.05	fraction
Pool Fire Radiation Ind Vulnerabilities (3)	0.099	fraction
Fire Ball Radiation Soc Vulnerabilities (1)	0.001	fraction
Fire Ball Radiation Soc Vulnerabilities (2)	0.05	fraction
Fire Ball Radiation Soc Vulnerabilities (3)	0.099	fraction
Fire Ball Radiation Ind Vulnerabilities (1)	0.001	fraction
Fire Ball Radiation Ind Vulnerabilities (2)	0.05	fraction
Fire Ball Radiation Ind Vulnerabilities (3)	0.099	fraction
Jet Fire Radiation Soc Vulnerabilities (1)	0.001	fraction
Jet Fire Radiation Soc Vulnerabilities (2)	0.05	fraction
Jet Fire Radiation Soc Vulnerabilities (3)	0.099	fraction
Jet Fire Radiation Ind Vulnerabilities (1)	0.001	fraction
Jet Fire Radiation Ind Vulnerabilities (2)	0.05	fraction
Jet Fire Radiation Ind Vulnerabilities (3)	0.099	fraction
Exposure time required for damage from Pool Fire	20	s
Exposure time required for damage from Jet Fire	20	s
Fireball (Societal Radiation Criteria Zone)	0.1	fraction
Fireball (Individual Radiation Criteria Zone)	0.1	fraction
Fireball (Societal Flammable Probit Zone)	0.1	fraction
Fireball (Individual Flammable Probit Zone)	0.1	fraction
Jet Fire (Societal Radiation Criteria Zone)	0.1	fraction
Jet Fire (Individual Radiation Criteria Zone)	0.1	fraction
Jet Fire (Societal Flammable Probit Zone)	0.1	fraction
Jet Fire (Individual Flammable Probit Zone)	0.1	fraction
Pool Fire (Societal Radiation Criteria Zone)	0.1	fraction
Pool Fire (Individual Radiation Criteria Zone)	0.1	fraction
Pool Fire (Societal Flammable Probit Zone)	0.1	fraction
Pool Fire (Individual Flammable Probit Zone)	0.1	fraction
Light Explosion Damage vulnerability	0.025	fraction

Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	9.8	kW/m2
Pool Fire Radiation Intensity Level (2)	19.5	kW/m2
Pool Fire Radiation Intensity Level (3)	35	kW/m2
Jet Fire Radiation Intensity Level (1)	9.8	kW/m2
Jet Fire Radiation Intensity Level (2)	19.5	kW/m2
Jet Fire Radiation Intensity Level (3)	35	kW/m2
Fire Ball Radiation Intensity Level (1)	9.8	kW/m2
Fire Ball Radiation Intensity Level (2)	19.5	kW/m2
Fire Ball Radiation Intensity Level (3)	35	kW/m2

Jet Fire Parameters

Maximum SEP for a Jet Fire	400	kW/m2
Jet Fire Averaging Time	20	s
Calculate Dose	Unselected	
Calculate Probit	Unselected	
Calculate Lethality	Unselected	
Crosswind Angle	0	deg
Correlation	DNV Recommended	
Horizontal Options	Use standard method	
Rate Modification Factor	3	
Jet Fire Maximum Exposure Duration	20	s
Emissivity Method	E and F calculated	
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Outdoor Vulnerability

Vulnerability Model	Overpressure Probit Method	
Pressure Method - Building calculation	Reflected	
Pressure Method - Individual Risk	Side on	
Pressure Method - Grid population	Side on	
Overpressure for Lethality (1)	0.3	bar
Lethality (1)	1	fraction
Lethality (1)	1	fraction
Equation Constant (1)	0.3	bar
Equation Exponent (1)	1	
Overpressure Offset (1)	0.3	bar
Impulse Offset (1)	0	N.s/m2
ProbitA	1.47	
ProbitB	1.35	
ProbitN	1	
Number of overpressures	1.00	

Number of impulses	1.00	
Pool Fire Radiation Soc Vulnerabilities (1)	0.01	fraction
Pool Fire Radiation Soc Vulnerabilities (2)	0.5	fraction
Pool Fire Radiation Soc Vulnerabilities (3)	0.99	fraction
Pool Fire Radiation Ind Vulnerabilities (1)	0.01	fraction
Pool Fire Radiation Ind Vulnerabilities (2)	0.5	fraction
Pool Fire Radiation Ind Vulnerabilities (3)	0.99	fraction
Fire Ball Radiation Soc Vulnerabilities (1)	0.01	fraction
Fire Ball Radiation Soc Vulnerabilities (2)	0.5	fraction
Fire Ball Radiation Soc Vulnerabilities (3)	0.99	fraction
Fire Ball Radiation Ind Vulnerabilities (1)	0.01	fraction
Fire Ball Radiation Ind Vulnerabilities (2)	0.5	fraction
Fire Ball Radiation Ind Vulnerabilities (3)	0.99	fraction
Jet Fire Radiation Soc Vulnerabilities (1)	0.01	fraction
Jet Fire Radiation Soc Vulnerabilities (2)	0.5	fraction
Jet Fire Radiation Soc Vulnerabilities (3)	0.99	fraction
Jet Fire Radiation Ind Vulnerabilities (1)	0.01	fraction
Jet Fire Radiation Ind Vulnerabilities (2)	0.5	fraction
Jet Fire Radiation Ind Vulnerabilities (3)	0.99	fraction
Exposure time required for damage from Pool Fire	20	s
Exposure time required for damage from Jet Fire	20	s
Fireball (Societal Radiation Criteria Zone)	1	fraction
Fireball (Individual Radiation Criteria Zone)	1	fraction
Fireball (Societal Flammable Probit Zone)	1	fraction
Fireball (Individual Flammable Probit Zone)	1	fraction
Jet Fire (Societal Radiation Criteria Zone)	1	fraction
Jet Fire (Individual Radiation Criteria Zone)	1	fraction
Jet Fire (Societal Flammable Probit Zone)	1	fraction
Jet Fire (Individual Flammable Probit Zone)	1	fraction
Pool Fire (Societal Radiation Criteria Zone)	1	fraction
Pool Fire (Individual Radiation Criteria Zone)	1	fraction
Pool Fire (Societal Flammable Probit Zone)	1	fraction
Pool Fire (Individual Flammable Probit Zone)	1	fraction
Light Explosion Damage vulnerability	0	fraction
Heavy explosion damage vulnerability	1	fraction
Method for Radiation Vulnerability	Use Probit method	
Flash Fire Vulnerability	1	
Toxic Vulnerability	1	
Pool Fire Radiation Intensity Level (1)	9.8	kW/m2
Pool Fire Radiation Intensity Level (2)	19.5	kW/m2
Pool Fire Radiation Intensity Level (3)	35	kW/m2
Jet Fire Radiation Intensity Level (1)	9.8	kW/m2
Jet Fire Radiation Intensity Level (2)	19.5	kW/m2
Jet Fire Radiation Intensity Level (3)	35	kW/m2
Fire Ball Radiation Intensity Level (1)	9.8	kW/m2
Fire Ball Radiation Intensity Level (2)	19.5	kW/m2
Fire Ball Radiation Intensity Level (3)	35	kW/m2

Pool Fire Parameters

Instantaneous releases	10	s
Continuous releases	10	s
Calculate Dose	Not selected	
Calculate Probit	Not selected	
Calculate Lethality	Not selected	
MaxExposureDuration	20	s

Radiative fraction for general fires	0.4	fraction
Intensity Levels (1)	9.8	kW/m2
Intensity Levels (2)	19.5	kW/m2
Intensity Levels (3)	35	kW/m2
Dose Levels (1)	1.27E6	
Dose Levels (2)	5.8E6	
Dose Levels (3)	2.51E7	
Probit Levels (1)	2.73	
Probit Levels (2)	3.72	
Probit Levels (3)	7.5	
Lethality Levels (1)	0.01	
Lethality Levels (2)	0.1	
Lethality Levels (3)	1	

Pool Vaporization Parameters

Toxics cut-off rate for pool evaporation	0.001	kg/s
Flammable cut-off rate for pool evaporation	0.1	kg/s
Concentration power to use in pool rate load calculation	1	
Maximum number of pool evaporation rates	10.00	
Pool minimum thickness	5	mm
Surface thermal conductivity	0.00221	kJ/m.s.degK
Surface roughness factor	2.634	
Surface thermal diffusivity	9.48E-7	m2/s
Type of Bund Surface	Concrete	
Bund Height	0	m
Bund Failure Modeling	Bund cannot fail	

Toxic Parameters

Toxics: minimum probability of death	0.001	
Toxics: height for calculation of effects	0	m
Toxics: results grid step in Y-direction	2.5	m
Toxics: results grid step in X-direction	25	m
Multi-comp. toxic calc. method	Mixture Probit	
Toxic Averaging Time - New Parameter	600	s
Probit Calculation Method	Use Probit	
Building Exchange Rate	4	/hr
Tail Time	1800	s
Indoor Calculations	Unselected	
Wind Dependent Exchange Rate	Case Specified	
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

Weather Parameters

Atmospheric pressure	1.013	bar
Atmospheric molecular weight	28.97	
Atmospheric specific heat at constant pressure	1.004	kJ/kg.degK
Wind speed reference height	10	m
Temperature reference height	0	m
Cut-off height for wind speed profile	1	m
Wind speed profile	Power Law	
Atmospheric T and P Profile	Temp.Logarithmic; Pres.Linear	
Atmospheric Temperature	25	degC
Relative Humidity	0.8	fraction
Parameter	0.1	
Length	183.2	mm

Surface Roughness	Use Parameter	
Surface Temperature for Dispersion Calculations	25	degC
Surface Temperature for Pool Calculations	25	degC
Solar Radiation Flux	0.5	kW/m2
Building Exchange Rate	4	/hr
Tail Time	1800	s
Surface Type	User-defined	
Mixing Layer Height for Pasquil Stability A	1300	m
Mixing Layer Height for Pasquil Stability A/B	1080	m
Mixing Layer Height for Pasquil Stability B	920	m
Mixing Layer Height for Pasquil Stability B/C	880	m
Mixing Layer Height for Pasquil Stability C	840	m
Mixing Layer Height for Pasquil Stability C/D	820	m
Mixing Layer Height for Pasquil Stability D	800	m
Mixing Layer Height for Pasquil Stability E	400	m
Mixing Layer Height for Pasquil Stability F	100	m
Mixing Layer Height for Pasquil Stability G	100	m