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**APPENDIX 5.2**

**Summary of Historical Incidents**

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The following are the result from MHIDAS database using “Material Name = Chlorine”, and “Origin Not contain rail-tanker and road-tanker”. 353 records returned:

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1917	RELEASE release-	STORAGE storage-; PSVESSEL pressurised- storage-vessels		
1926	CONTREL continuous-release; DENSGSCL dense- gas-cloud	STORAGE storage-; PSVESSEL pressurised- storage-vessels	MECHANICAL mechanical-failure; HUMAN human-factor; VREACTION violent- reaction	VALVE leaking-or-passing- valve; MAINTAIN general- maintenance; CONEXP confined-explosion
1928	PHYSEXP physical- explosion	PROCESS process-; PSVESSEL pressurised- storage-vessels	VREACTION violent- reaction; MECHANICAL mechanical-failure; HUMAN human-factor	OVERPRES overpressure; PROCEDURES procedural- failures
1929	EXPLODE explosion-; DENSGSCL dense- gas-cloud	STORAGE storage-; PSVESSEL pressurised- storage-vessels	VREACTION violent- reaction; PROCOND upset-process-conditions	CONEXP confined-explosion
1935	RELEASE release-; GASCLD gas-cloud	TRANSPORT transport-; PACKAGE portable-transport- containers	MECHANICAL mechanical-failure; HUMAN human-factor	VALVE leaking-or-passing- valve; PROCEDURES procedural-failures; ISOLUNCOUP failure-to- isolate-or-drain-before- uncoupling
1935	RELEASE release-; PHYSEXP physical- explosion	PROCESS process-; PACKAGE portable-transport- containers	MECHANICAL mechanical-failure; HUMAN human-factor	OVERPRES overpressure; PROCEDURES procedural- failures
1936	RELEASE release-; DENSGSCL dense- gas-cloud	PROCESS process-; PACKAGE portable-transport- containers	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve
1939	RELEASE release-; DENSGSCL dense- gas-cloud	STORAGE storage-; PSVESSEL pressurised- storage-vessels	MECHANICAL mechanical-failure	
1940	EXPLODE explosion-	PROCESS process-; PACKAGE portable-transport- containers	VREACTION violent- reaction; PROCOND upset-process-conditions	CONEXP confined-explosion
1940	RELEASE release-; DENSGSCL dense- gas-cloud	STORAGE storage-; PACKAGE portable-transport- containers	MECHANICAL mechanical-failure	FLANGCOUPL leaking- coupling-or-flange
1944	CONTREL continuous-release; DENSGSCL dense- gas-cloud	TRANSPORT transport-; PACKAGE portable-transport- containers	MECHANICAL mechanical-failure	CORRODE corrosion
1944	CONTREL continuous-release	STORAGE storage-; PACKAGE portable-transport- containers	EXTERNAL external- events; MECHANICAL mechanical-failure	EXTNLFIRE fire; VALVE leaking-or-passing-valve
1944	CONTREL continuous-release; DENSGSCL dense- gas-cloud	PROCESS process-; PACKAGE portable-transport- containers	MECHANICAL mechanical-failure	OVERHEAT overheating; VALVE leaking-or-passing- valve
1946	INSTREL instantaneous- release	TRANSPORT transport-; PACKAGE portable-transport- containers	IMPACT impact-failure	RAILACC rail-accident,-no- other-vehicle
1947	RELEASE release-	TRANSPORT transport-; PACKAGE portable-transport- containers	IMPACT impact-failure; HUMAN human-factor	RAILACC rail-accident,-no- other-vehicle
1947	RELEASE release-; DENSGSCL dense- gas-cloud	STORAGE storage-; PSVESSEL pressurised- storage-vessels	HUMAN human-factor; MECHANICAL mechanical-failure	OVERFILL overfilling; OVERPRES overpressure
1949	CONTREL continuous-release	TRANSPORT transport-; PACKAGE portable-transport- containers	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1949	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSPORT transport-; PIPELINE pipeline-	HUMAN human-factor	MAINTAIN general-maintenance; COMMUNICAT communications
1950	CONTREL continuous-release; DENSGSCL dense-gas-cloud	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers	MECHANICAL mechanical-failure	CORRODE corrosion
1951	RELEASE release-; DENSGSCL dense-gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure; HUMAN human-factor	HOSE hose-failure; ISOLUNCOUP failure-to-isolate-or-drain-before-uncoupling; MAINTAIN general-maintenance
1952	RELEASE release-; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	MECHANICAL mechanical-failure	FATIGUE material-fatigue
1956	RELEASE release-; DENSGSCL dense-gas-cloud	PROCESS process-; PIPEWORK pipework-		
1958	EXPLODE explosion-	PROCESS process-	MECHANICAL mechanical-failure; VREACTION violent-reaction	VALVE leaking-or-passing-valve; CONEXP confined-explosion
1959	RELEASE release-	PROCESS process-; HEATXCHANG heat-exchangers	MECHANICAL mechanical-failure	
1959	RELEASE release-	PROCESS process-; PUMP pumps,-compressors	SERVICE services-failure	ELECTRIC electricity
1959	CONTREL continuous-release; DENSGSCL dense-gas-cloud	PROCESS process-; PIPEWORK pipework-	HUMAN human-factor	MAINTAIN general-maintenance; COMMUNICAT communications; ISOLUNCOUP failure-to-isolate-or-drain-before-uncoupling
1960	RELEASE release-	PROCESS process-; HEATXCHANG heat-exchangers	MECHANICAL mechanical-failure; VREACTION violent-reaction	CORRODE corrosion
1960	RELEASE release-; GASCLD gas-cloud	TRANSFER loading,-unloading; HOSE hose-	MECHANICAL mechanical-failure; HUMAN human-factor; IMPACT impact-failure	OVERPRES overpressure; HOSE hose-failure; HVOBJECT heavy-object
1960	RELEASE release-	TRANSPORT transport-; PACKAGE portable-transport-containers	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1961	EXPLODE explosion-; FIRE fire-	PROCESS process-; PVESSEL process-vessels	VREACTION violent-reaction	RUNAWAY runaway-reaction
1961	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; TANKCONTNR tank-container	MECHANICAL mechanical-failure; IMPACT impact-failure	CORRODE corrosion
1961	CONTREL continuous-release	TRANSPORT transport-; PIPELINE pipeline-		
1962	EXPLODE explosion-; DENSGSCL dense-gas-cloud	STORAGE storage-; PIPEWORK pipework-	MECHANICAL mechanical-failure; VREACTION violent-reaction; PROCOND upset-process-conditions	VALVE leaking-or-passing-valve; CONEXP confined-explosion
1962	EXPLODE explosion-; RELEASE release-	STORAGE storage-; PACKAGE portable-transport-containers	VREACTION violent-reaction; MECHANICAL mechanical-failure	RUNAWAY runaway-reaction; OVERPRES overpressure
1963	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; HOSE hose-	HUMAN human-factor; MECHANICAL mechanical-failure; IMPACT impact-failure	GENERALOP general-operational; HOSE hose-failure; VEHICLE other-vehicle
1964	RELEASE release-; DENSGSCL dense-gas-cloud	PROCESS process-; PVESSEL process-vessels	MECHANICAL mechanical-failure	CORRODE corrosion

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1964	RELEASE release-	TRANSFER loading,-unloading; ROADTANKER road-tanker	HUMAN human-factor	CONNECTING failure-to-connect-or-disconnect
1964	RELEASE release-; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; PACKAGE portable-transport-containers	HUMAN human-factor	GENERALOP general-operational; PROCEDURES procedural-failures
1964	RELEASE release-; DENSGSCL dense-gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	METALLURG other-metallurgical-failure
1964	RELEASE release-	PROCESS process-; PIPEWORK pipework-	HUMAN human-factor; VREACTION violent-reaction	DESIGN design-error; RUNAWAY runaway-reaction
1966	RELEASE release-; DENSGSCL dense-gas-cloud	TRANSPORT transport-; PACKAGE portable-transport-containers	IMPACT impact-failure	ROADACC road-accident,-no-other-vehicle; VEHICLE other-vehicle
1967	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSPORT transport-; PIPELINE pipeline-	IMPACT impact-failure; HUMAN human-factor	EXCAVEQUIP excavating-equipment; GENERALOP general-operational
1967	PHYSEXP physical-explosion; DENSGSCL dense-gas-cloud	PROCESS process-; REACTOR reactor-	MECHANICAL mechanical-failure; EXTERNAL external-events; SERVICE services-failure	OVERPRES overpressure; LIGHTNING lightning; ELECTRIC electricity
1967	CONTREL continuous-release	PROCESS process-; PIPEWORK pipework-		
1967	RELEASE release-	WAREHOUSE warehouse-; PACKAGE portable-transport-containers	EXTERNAL external-events	EXTNLFIRE fire
1967	RELEASE release-; DENSGSCL dense-gas-cloud	PROCESS process-; REACTOR reactor-	VREACTION violent-reaction; MECHANICAL mechanical-failure	RUNAWAY runaway-reaction; OVERPRES overpressure
1967	RELEASE release-; DENSGSCL dense-gas-cloud	STORAGE storage-; PACKAGE portable-transport-containers	EXTERNAL external-events	EXTNLEXP explosion; EXTNLFIRE fire
1968	GASCLD gas-cloud	PROCESS process-	HUMAN human-factor; VREACTION violent-reaction	PROCEDURES procedural-failures
1968	CONTREL continuous-release; DENSGSCL dense-gas-cloud	PROCESS process-; PVESSEL process-vessels	MECHANICAL mechanical-failure	
1968	INSTREL instantaneous-release; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	IMPACT impact-failure	HVYOBJECT heavy-object
1968	DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; PSVESSEL pressurised-storage-vessels	HUMAN human-factor	GENERALOP general-operational
1968	DENSGSCL dense-gas-cloud	WAREHOUSE warehouse-	EXTERNAL external-events	EXTNLFIRE fire
1968	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; PIPEWORK pipework-	MECHANICAL mechanical-failure	
1969	RELEASE release-; DENSGSCL dense-gas-cloud	STORAGE storage-; PACKAGE portable-transport-containers		
1969	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; HOSE hose-	MECHANICAL mechanical-failure	GLANDSEAL leaking-gland-or-seal
1969	INSTREL instantaneous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; HOSE hose-	MECHANICAL mechanical-failure	HOSE hose-failure

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1969	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; TANKCONTNR tank-container	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1969	RELEASE release-; DENSGSCL dense-gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	GLANDSEAL leaking-gland-or-seal
1970	RELEASE release-; DENSGSCL dense-gas-cloud	STORAGE storage-; ASVESSEL storage-vessels,-atmospheric-pressure	HUMAN human-factor; PROCOND upset-process-conditions	GENERALOP general-operational; INCOMPAT use-of-incompatible-materials
1970	DENSGSCL dense-gas-cloud	WAREHOUSE warehouse-; PACKAGE portable-transport-containers	EXTERNAL external-events	EXTNLFIRE fire
1970	CONTREL continuous-release; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve; MAINTAIN general-maintenance
1970	RELEASE release-; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	HUMAN human-factor; MECHANICAL mechanical-failure	GENERALOP general-operational; METALLURG other-metallurgical-failure; VALVE leaking-or-passing-valve
1971	RELEASE release-; DENSGSCL dense-gas-cloud	TRANSPORT transport-; PIPELINE pipeline-	MECHANICAL mechanical-failure	WELDFAIL weld-failure; CORRODE corrosion
1971	EXPLODE explosion-	PROCESS process-; PVESSEL process-vessels	VREACTION violent-reaction; PROCOND upset-process-conditions; MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve; CORRODE corrosion
1971	DENSGSCL dense-gas-cloud; RELEASE release-	TRANSFER loading,-unloading; BARGE barge-	MECHANICAL mechanical-failure	METALLURG other-metallurgical-failure
1971	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; PIPEWORK pipework-	MECHANICAL mechanical-failure	METALLURG other-metallurgical-failure
1972	INSTREL instantaneous-release; DENSGSCL dense-gas-cloud	PROCESS process-; PVESSEL process-vessels	MECHANICAL mechanical-failure; PROCOND upset-process-conditions	OVERPRES overpressure
1972	RELEASE release-	PROCESS process-; PIPEWORK pipework-		
1973	CONEXP confined-explosion	PROCESS process-; PVESSEL process-vessels	VREACTION violent-reaction; HUMAN human-factor; MECHANICAL mechanical-failure	CONEXP confined-explosion; DESIGN design-error; CORRODE corrosion
1973	RELEASE release-; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading		
1973	RELEASE release-	PROCESS process-; PIPEWORK pipework-	HUMAN human-factor	MAINTAIN general-maintenance
1973	RELEASE release-	PROCESS process-; REACTOR reactor-	VREACTION violent-reaction	
1973	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; HOSE hose-	MECHANICAL mechanical-failure; IMPACT impact-failure	HOSE hose-failure; VEHICLE other-vehicle
1973	RELEASE release-; DENSGSCL dense-gas-cloud	PROCESS process-; PVESSEL process-vessels	PROCOND upset-process-conditions; VREACTION violent-reaction	RUNAWAY runaway-reaction
1974	CONTREL continuous-release; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1974	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; PSVESSEL pressurised-storage-vessels	IMPACT impact-failure; HUMAN human-factor	CRANE crane-impact; GENERALOP general-operational

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1974	CONTREL continuous-release; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	HUMAN human-factor	PROCEDURES procedural-failures
1974	EXPLODE explosion-; RELEASE release-	PROCESS process-	EXTERNAL external-events	EXTNLEXP explosion
1975	INSTREL instantaneous-release; DENSGSCL dense-gas-cloud	PROCESS process-; REACTOR reactor-	SERVICE services-failure; PROCOND upset-process-conditions; INSTRUMENT instrument-failure	ELECTRIC electricity; ALARM alarm-failure
1975	RELEASE release-; DENSGSCL dense-gas-cloud	STORAGE storage-; PIPEWORK pipework-	HUMAN human-factor; MECHANICAL mechanical-failure	ACCVENT accidental-venting; VALVE leaking-or-passing-valve
1975	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; HOSE hose-	IMPACT impact-failure; HUMAN human-factor; MECHANICAL mechanical-failure	VEHICLE other-vehicle; CONNECTING failure-to-connect-or-disconnect; HOSE hose-failure
1976	CONTREL continuous-release; DENSGSCL dense-gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	CORRODE corrosion
1976	RELEASE release-	STORAGE storage-; PACKAGE portable-transport-containers	EXTERNAL external-events	EXTNLFIRE fire
1976	PHYSEXP physical-explosion; GASCLD gas-cloud	STORAGE storage-; PACKAGE portable-transport-containers	VREACTION violent-reaction	
1976	CONTREL continuous-release; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	EXTERNAL external-events; IMPACT impact-failure	EXTNLEXP explosion; HVYOBJECT heavy-object
1977	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; HOSE hose-	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1977	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; PSVESSEL pressurised-storage-vessels	IMPACT impact-failure; MECHANICAL mechanical-failure	HVYOBJECT heavy-object; WELDFAIL weld-failure
1977	CONTREL continuous-release; DENSGSCL dense-gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	FLANGCOUPL leaking-coupling-or-flange
1977	RELEASE release-; GASCLD gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1977	EXPLODE explosion-; DENSGSCL dense-gas-cloud	PROCESS process-		
1977	EXPLODE explosion-; FIRE fire-	WAREHOUSE warehouse-; PACKAGE portable-transport-containers		
1978	RELEASE release-; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; PACKAGE portable-transport-containers	HUMAN human-factor	GENERALOP general-operational
1978	DENSGSCL dense-gas-cloud; FIRE fire-	WAREHOUSE warehouse-; PACKAGE portable-transport-containers	VREACTION violent-reaction; HUMAN human-factor	RUNAWAY runaway-reaction; GENERALOP general-operational
1978	RELEASE release-	PROCESS process-; PUMP pumps,-compressors	MECHANICAL mechanical-failure; VREACTION violent-reaction; PROCOND upset-process-conditions	RUNAWAY runaway-reaction

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1978		TRANSPORT transport-; PACKAGE portable-transport- containers	HUMAN human-factor; IMPACT impact-failure	GENERALOP general- operational; HVYOBJECT heavy-object
1978	RELEASE release-	PROCESS process-; PACKAGE portable-transport- containers		
1978	CONTREL continuous-release; DENSGSCL dense- gas-cloud	PIPEWORK pipework-	MECHANICAL mechanical-failure	OVERHEAT overheating; CORRODE corrosion; INCOMPAT use-of- incompatible-materials
1978	RELEASE release-; GASCLD gas-cloud	PROCESS process-; PVESSEL process-vessels		
1978	RELEASE release-; DENSGSCL dense- gas-cloud	PROCESS process-; PSVESSEL pressurised- storage-vessels	MECHANICAL mechanical-failure; HUMAN human-factor	GLANDSEAL leaking-gland-or- seal; GENERALOP general- operational
1978	RELEASE release-; GASCLD gas-cloud	STORAGE storage-; PSVESSEL pressurised- storage-vessels	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve
1978	RELEASE release-	PROCESS process-	HUMAN human-factor	DESIGN design-error
1978	RELEASE release-	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	
1979	DENSGSCL dense- gas-cloud	STORAGE storage-; PSVESSEL pressurised- storage-vessels		
1979	DENSGSCL dense- gas-cloud	TRANSFER loading,-unloading; ASVESSEL storage-vessels,- atmospheric-pressure	VREACTION violent- reaction; PROCOND upset-process-conditions; HUMAN human-factor	PROCEDURES procedural- failures
1979	RELEASE release-	TRANSFER loading,-unloading; PUMP pumps,-compressors	VREACTION violent- reaction	
1979	DENSGSCL dense- gas-cloud; CONTREL continuous-release	STORAGE storage-; PSVESSEL pressurised- storage-vessels		
1979		TRANSPORT transport-; PACKAGE portable-transport- containers	IMPACT impact-failure	SHIP/SHIP ship-to-ship- collision,-also-barges
1979	RELEASE release-	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	CORRODE corrosion
1979	RELEASE release-	STORAGE storage-; PACKAGE portable-transport- containers		
1979	CONTREL continuous-release	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure; HUMAN human-factor	VALVE leaking-or-passing- valve; PROCEDURES procedural-failures
1979	CONTREL continuous-release; DENSGSCL dense- gas-cloud	PROCESS process-	SERVICE services-failure	ELECTRIC electricity
1980		DOM/COM domestic-or- commercial		
1980	CONTREL continuous-release; DENSGSCL dense- gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve
1980	CONTREL continuous-release; DENSGSCL dense- gas-cloud	TRANSFER loading,-unloading; PUMP pumps,-compressors	MECHANICAL mechanical-failure	GLANDSEAL leaking-gland-or- seal
1980	CONTREL continuous-release; DENSGSCL dense- gas-cloud	TRANSFER loading,-unloading; PUMP pumps,-compressors	MECHANICAL mechanical-failure	

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1980	RELEASE release-	PROCESS process-; PSVESSEL pressurised- storage-vessels	MECHANICAL mechanical-failure	
1980	RELEASE release-	TRANSPORT transport-; PACKAGE portable-transport- containers	IMPACT impact-failure	ROADACC road-accident,-no- other-vehicle
1980	RELEASE release-; DENSGSCL dense- gas-cloud	TRANSFER loading,-unloading; BARGE barge-	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve
1980	RELEASE release-; DENSGSCL dense- gas-cloud	TRANSFER loading,-unloading; PSVESSEL pressurised- storage-vessels	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve
1980	CONTREL continuous-release; DENSGSCL dense- gas-cloud	PROCESS process-; PSVESSEL pressurised- storage-vessels	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve
1981	CONTREL continuous-release; DENSGSCL dense- gas-cloud	STORAGE storage-; PSVESSEL pressurised- storage-vessels		
1981	RELEASE release-	STORAGE storage-; PACKAGE portable-transport- containers	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve
1981	RELEASE release-; GASCLD gas-cloud	PROCESS process-	SERVICE services-failure	ELECTRIC electricity
1981	CONTREL continuous-release; DENSGSCL dense- gas-cloud	STORAGE storage-; PSVESSEL pressurised- storage-vessels	HUMAN human-factor	CONNECTING failure-to- connect-or-disconnect
1981	FIRE fire-	TRANSPORT transport-; PACKAGE portable-transport- containers	VREACTION violent- reaction	INTNLFIRE internal-fire
1981	CONTREL continuous-release	STORAGE storage-; PSVESSEL pressurised- storage-vessels	MECHANICAL mechanical-failure	CORRODE corrosion
1981	RELEASE release-; DENSGSCL dense- gas-cloud	STORAGE storage-; PSVESSEL pressurised- storage-vessels	MECHANICAL mechanical-failure	METALLURG other- metallurgical-failure
1981	RELEASE release-; DENSGSCL dense- gas-cloud	PROCESS process-		
1981	RELEASE release-; DENSGSCL dense- gas-cloud	PROCESS process-; PACKAGE portable-transport- containers		
1982	CONTREL continuous-release; DENSGSCL dense- gas-cloud	PROCESS process-; PSVESSEL pressurised- storage-vessels		
1982	CONTREL continuous-release; DENSGSCL dense- gas-cloud	TRANSPORT transport-; PIPELINE pipeline-		
1983	RELEASE release-; DENSGSCL dense- gas-cloud	PROCESS process-; PIPEWORK pipework-	HUMAN human-factor	GENERALOP general- operational; VALVE leaking-or- passing-valve
1983	CONTREL continuous-release; DENSGSCL dense- gas-cloud	TRANSFER loading,-unloading; HOSE hose-	HUMAN human-factor	GENERALOP general- operational
1983	CONTREL continuous-release; DENSGSCL dense- gas-cloud	PROCESS process-; REACTOR reactor-	SERVICE services-failure; EXTERNAL external- events	ELECTRIC electricity; EXTNLEXP explosion
1983	CONTREL continuous-release; DENSGSCL dense- gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve



Incident Year	Incident Type	Origin	General Cause	Specific Cause
1983	INSTREL instantaneous-release; DENSGSCL dense-gas-cloud	PROCESS process-; PACKAGE portable-transport-containers	EXTERNAL external-events	EXTNLFIRE fire
1984	RELEASE release-	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	OVERHEAT overheating
1984	GASCLD gas-cloud	TRANSFER loading,-unloading; ASVESSEL storage-vessels,-atmospheric-pressure	HUMAN human-factor; VREACTION violent-reaction	MANAGEMENT general-management-error; COMMUNICAT communications; RUNAWAY runaway-reaction
1984	GASCLD gas-cloud	TRANSFER loading,-unloading	HUMAN human-factor; VREACTION violent-reaction; MECHANICAL mechanical-failure	MANAGEMENT general-management-error; RUNAWAY runaway-reaction
1985	RELEASE release-; DENSGSCL dense-gas-cloud	STORAGE storage-; PACKAGE portable-transport-containers	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1985	GASCLD gas-cloud	PROCESS process-; PIPEWORK pipework-	HUMAN human-factor	DRAINACC draining-accident; GENERALOP general-operational
1985	RELEASE release-	TRANSPORT transport-; PIPEWORK pipework-	MECHANICAL mechanical-failure; VREACTION violent-reaction	VALVE leaking-or-passing-valve
1985	RELEASE release-; DENSGSCL dense-gas-cloud	PROCESS process-		
1985	CONTREL continuous-release; DENSGSCL dense-gas-cloud	STORAGE storage-; PIPEWORK pipework-	MECHANICAL mechanical-failure	FATIGUE material-fatigue; CORRODE corrosion
1985	FIRE fire-; RELEASE release-	WAREHOUSE warehouse-		
1985	RELEASE release-; DENSGSCL dense-gas-cloud	PROCESS process-		
1985	RELEASE release-	TRANSFER loading,-unloading	MECHANICAL mechanical-failure	
1985	RELEASE release-; GASCLD gas-cloud	PROCESS process-	HUMAN human-factor; VREACTION violent-reaction	GENERALOP general-operational; RUNAWAY runaway-reaction
1985	CONTREL continuous-release; DENSGSCL dense-gas-cloud	DOM/COM domestic-or-commercial	HUMAN human-factor	GENERALOP general-operational
1985	INSTREL instantaneous-release; DENSGSCL dense-gas-cloud	PROCESS process-; ASVESSEL storage-vessels,-atmospheric-pressure	HUMAN human-factor	GENERALOP general-operational
1986	RELEASE release-; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	HUMAN human-factor	ACCVENT accidental-venting; PROCEDURES procedural-failures; COMMUNICAT communications
1986	RELEASE release-; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; HOSE hose-	MECHANICAL mechanical-failure	CORRODE corrosion
1986	FIRE fire-; RELEASE release-	WAREHOUSE warehouse-		
1986	INSTREL instantaneous-release	PROCESS process-; PVESSEL process-vessels	HUMAN human-factor; PROCOND upset-process-conditions	GENERALOP general-operational
1986	RELEASE release-; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; PIPEWORK pipework-	HUMAN human-factor	GENERALOP general-operational
1986	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; PIPEWORK pipework-	HUMAN human-factor; MECHANICAL mechanical-failure	GENERALOP general-operational; VALVE leaking-or-passing-valve

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1987	CONTREL continuous-release; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	MECHANICAL mechanical-failure	
1987	CONTREL continuous-release	DOM/COM domestic-or-commercial; PSVESSEL pressurised-storage-vessels	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1987	CONTREL continuous-release; DENSGSCL dense-gas-cloud	STORAGE storage-; PACKAGE portable-transport-containers	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1987	CONTREL continuous-release	STORAGE storage-; PSVESSEL pressurised-storage-vessels	HUMAN human-factor	
1987	DENSGSCL dense-gas-cloud; CONTREL continuous-release	PROCESS process-		
1987	CONTREL continuous-release; GASCLD gas-cloud	PROCESS process-; REACTOR reactor-	MECHANICAL mechanical-failure	
1987	GASCLD gas-cloud	DOM/COM domestic-or-commercial	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve; INCOMPAT use-of-incompatible-materials
1987	EXPLODE explosion-; RELEASE release-	PROCESS process-		
1988	RELEASE release-; FIRE fire-	WAREHOUSE warehouse-; PACKAGE portable-transport-containers	VREACTION violent-reaction	RUNAWAY runaway-reaction; INTNLFIRE internal-fire
1988	RELEASE release-; DENSGSCL dense-gas-cloud	PROCESS process-; PIPEWORK pipework-	EXTERNAL external-events	EXTNLEXP explosion
1988	RELEASE release-; DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; PIPEWORK pipework-	MECHANICAL mechanical-failure	
1988	RELEASE release-	DOM/COM domestic-or-commercial	HUMAN human-factor	GENERALOP general-operational
1988	GASCLD gas-cloud; FIRE fire-	STORAGE storage-; PACKAGE portable-transport-containers	EXTERNAL external-events; HUMAN human-factor; VREACTION violent-reaction	MANAGEMENT general-management-error; RUNAWAY runaway-reaction
1988	RELEASE release-	STORAGE storage-	MECHANICAL mechanical-failure	
1988	CONTREL continuous-release; GASCLD gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	OVERPRES overpressure
1988	CONEXP confined-explosion; FIRE fire-	PROCESS process-; PSVESSEL pressurised-storage-vessels	SERVICE services-failure	ELECTRIC electricity
1988	FIRE fire-; DENSGSCL dense-gas-cloud	WAREHOUSE warehouse-; PACKAGE portable-transport-containers		
1989	CONTREL continuous-release	DOM/COM domestic-or-commercial		
1989	RELEASE release-	PROCESS process-; HOSE hose-	HUMAN human-factor	CONNECTING failure-to-connect-or-disconnect
1989	CONTREL continuous-release	PROCESS process-	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1989	FIRE fire-; GASCLD gas-cloud	PROCESS process-	VREACTION violent-reaction	RUNAWAY runaway-reaction
1989	RELEASE release-	PROCESS process-		
1989	RELEASE release-; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	MECHANICAL mechanical-failure	CORRODE corrosion; OVERPRES overpressure

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1989	DENSGSCL dense-gas-cloud	PROCESS process-		
1989	DENSGSCL dense-gas-cloud	TRANSFER loading,-unloading; ROADTANKER road-tanker	HUMAN human-factor	GENERALOP general-operational; CONNECTING failure-to-connect-or-disconnect
1989	DENSGSCL dense-gas-cloud; INSTREL instantaneous-release	STORAGE storage-; PSVESSEL pressurised-storage-vessels		
1989	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSPORT transport-; PACKAGE portable-transport-containers	MECHANICAL mechanical-failure	
1989	RELEASE release-	DOM/COM domestic-or-commercial; PSVESSEL pressurised-storage-vessels	MECHANICAL mechanical-failure	
1989	CONTREL continuous-release; DENSGSCL dense-gas-cloud	STORAGE storage-; PSVESSEL pressurised-storage-vessels	HUMAN human-factor	OVERFILL overfilling
1990	RELEASE release-	STORAGE storage-; PACKAGE portable-transport-containers		
1990	RELEASE release-	STORAGE storage-; ASVESSEL storage-vessels,-atmospheric-pressure	VREACTION violent-reaction	RUNAWAY runaway-reaction
1990	RELEASE release-	DOM/COM domestic-or-commercial; PIPEWORK pipework-	EXTERNAL external-events	LIGHTNING lightning
1990	RELEASE release-	PROCESS process-		
1990	RELEASE release-	TRANSPORT transport-; PACKAGE portable-transport-containers	IMPACT impact-failure	ROADACC road-accident,-no-other-vehicle
1990		TRANSPORT transport-; PACKAGE portable-transport-containers	IMPACT impact-failure	ROADACC road-accident,-no-other-vehicle
1990	RELEASE release-	PROCESS process-		
1990	POOL pool-of-liquid-formed; DENSGSCL dense-gas-cloud	DOM/COM domestic-or-commercial	HUMAN human-factor	PROCEDURES procedural-failures
1990	CONTREL continuous-release; DENSGSCL dense-gas-cloud	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers		
1990	CONTREL continuous-release; DENSGSCL dense-gas-cloud	DOM/COM domestic-or-commercial	HUMAN human-factor	PROCEDURES procedural-failures
1990	CONTREL continuous-release; DENSGSCL dense-gas-cloud	DOM/COM domestic-or-commercial	MECHANICAL mechanical-failure	
1990	DENSGSCL dense-gas-cloud	PROCESS process-		
1990	CONTREL continuous-release; DENSGSCL dense-gas-cloud	PROCESS process-; PIPEWORK pipework-		
1990	DENSGSCL dense-gas-cloud	DOM/COM domestic-or-commercial	VREACTION violent-reaction	RUNAWAY runaway-reaction
1991	FIRE fire-	WAREHOUSE warehouse-		
1991	CONTREL continuous-release	PROCESS process-	EXTERNAL external-events	

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1991	RELEASE release-	PROCESS process-; PACKAGE portable-transport- containers		
1991	RELEASE release-	STORAGE storage-; PACKAGE portable-transport- containers		
1991	RELEASE release-	DOM/COM domestic-or- commercial		
1991	RELEASE release-	DOM/COM domestic-or- commercial; PACKAGE portable-transport- containers	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve
1991	RELEASE release-	PROCESS process-; PIPEWORK pipework-		
1991	RELEASE release-; GASCLD gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	HOSE hose-failure
1991	RELEASE release-	PROCESS process-; PACKAGE portable-transport- containers	HUMAN human-factor	
1991	RELEASE release-	TRANSPORT transport-; PACKAGE portable-transport- containers	IMPACT impact-failure	
1991	RELEASE release-	TRANSFER loading,-unloading; PIPEWORK pipework-	MECHANICAL mechanical-failure	CORRODE corrosion
1991	RELEASE release-	DOM/COM domestic-or- commercial		
1991	RELEASE release-	DOM/COM domestic-or- commercial	MECHANICAL mechanical-failure	CORRODE corrosion; VALVE leaking-or-passing-valve
1991	RELEASE release-	DOM/COM domestic-or- commercial		
1992	RELEASE release-	PROCESS process-; PIPEWORK pipework-	IMPACT impact-failure	
1992	RELEASE release-	STORAGE storage-; PACKAGE portable-transport- containers	HUMAN human-factor	PROCEDURES procedural- failures
1992	RELEASE release-	DOM/COM domestic-or- commercial; PIPEWORK pipework-		
1992	RELEASE release-	DOM/COM domestic-or- commercial		
1992	FIRE fire-; EXPLODE explosion-	WASTE waste-storage		
1992	RELEASE release-	DOM/COM domestic-or- commercial		
1992	RELEASE release-	STORAGE storage-; PACKAGE portable-transport- containers		
1992	RELEASE release-	PROCESS process-; PIPEWORK pipework-	HUMAN human-factor	
1992	RELEASE release-	PROCESS process-		
1992	RELEASE release-	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	CORRODE corrosion
1992	RELEASE release-	PROCESS process-		
1993	CONTREL continuous-release	PROCESS process-		
1993	RELEASE release-	DOM/COM domestic-or- commercial	HUMAN human-factor	GENERALOP general- operational
1993	EXPLODE explosion-	PROCESS process-		
1993	CONTREL continuous-release	TRANSFER loading,-unloading; HOSE hose-	HUMAN human-factor	GENERALOP general- operational
1993	RELEASE release-	DOM/COM domestic-or- commercial	EXTERNAL external- events	EXTNLFIRE fire

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1993	RELEASE release-	DOM/COM domestic-or-commercial; PIPEWORK pipework-		
1993	RELEASE release-	PROCESS process-; PUMP pumps,-compressors	MECHANICAL mechanical-failure	
1993	RELEASE release-	DOM/COM domestic-or-commercial		
1993	GASCLD gas-cloud	PROCESS process-	EXTERNAL external-events	EXTNLFIRE fire
1994	FIRE fire-	PROCESS process-; REACTOR reactor-	HUMAN human-factor; HUMAN human-factor	GENERALOP general-operational; PROCEDURES procedural-failures
1994	RELEASE release-	DOM/COM domestic-or-commercial		
1994	CONTREL continuous-release	PROCESS process-; PIPEWORK pipework-	INSTRUMENT instrument-failure; MECHANICAL mechanical-failure	INDICATOR indicator-failure
1994	RELEASE release-	DOM/COM domestic-or-commercial	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1994	RELEASE release-	DOM/COM domestic-or-commercial	EXTERNAL external-events	EXTNLFIRE fire
1994	RELEASE release-	PROCESS process-	HUMAN human-factor	MAINTAIN general-maintenance
1994	RELEASE release-	PROCESS process-		
1994	RELEASE release-	STORAGE storage-; PACKAGE portable-transport-containers		
1994	CONTREL continuous-release	STORAGE storage-; ASVESSEL storage-vessels,-atmospheric-pressure	EXTERNAL external-events	SABOTAGE sabotage-or-vandalism
1994	FIRE fire-; RELEASE release-	DOM/COM domestic-or-commercial		
1994	RELEASE release-	DOM/COM domestic-or-commercial	HUMAN human-factor; VREACTION violent-reaction	GENERALOP general-operational
1995	GASCLD gas-cloud	PROCESS process-	EXTERNAL external-events; EXTERNAL external-events	SABOTAGE sabotage-or-vandalism; EXTNLFIRE fire
1995	DENSGSCL dense-gas-cloud	PROCESS process-	EXTERNAL external-events	EXTNLFIRE fire
1995	RELEASE release-; GASCLD gas-cloud	PROCESS process-; PUMP pumps,-compressors	MECHANICAL mechanical-failure	
1995	CONTREL continuous-release	STORAGE storage-; TANKCONTNR tank-container		
1995	CONEXP confined-explosion	STORAGE storage-; PACKAGE portable-transport-containers		
1995	EXPLODE explosion-	PROCESS process-		
1995	FIRE fire-	TRANSPORT transport-; PACKAGE portable-transport-containers	EXTERNAL external-events	EXTNLFIRE fire
1995	FIRE fire-	STORAGE storage-		
1996	CONTREL continuous-release	DOM/COM domestic-or-commercial; COMMTANK small-commercial-tank	HUMAN human-factor	GENERALOP general-operational
1996	CONTREL continuous-release	TRANSFER loading,-unloading; ROADTANKER road-tanker		
1996		TRANSPORT transport-; PACKAGE portable-transport-containers	EXTERNAL external-events	EXTNLFIRE fire

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1996	FIRE fire-; DENSGSCL dense-gas-cloud	WAREHOUSE warehouse-		
1997	CONTREL continuous-release	DOM/COM domestic-or-commercial		
1997	CONTREL continuous-release	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers		
1997	CONTREL continuous-release	DOM/COM domestic-or-commercial	HUMAN human-factor	GENERALOP general-operational
1997	CONTREL continuous-release	DOM/COM domestic-or-commercial	HUMAN human-factor	GENERALOP general-operational
1997	CONTREL continuous-release	DOM/COM domestic-or-commercial		
1997	CONTREL continuous-release; DENSGSCL dense-gas-cloud	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers		
1997	CONTREL continuous-release	DOM/COM domestic-or-commercial; COMMTANK small-commercial-tank		
1997	EXPLODE explosion-; CONTREL continuous-release	STORAGE storage-; PSVESSEL pressurised-storage-vessels		
1997	CONTREL continuous-release	TRANSPORT transport-; PACKAGE portable-transport-containers	IMPACT impact-failure	ROADACC road-accident,-no-other-vehicle
1997	CONTREL continuous-release	DOM/COM domestic-or-commercial; PUMP pumps,-compressors		
1997	CONTREL continuous-release	DOM/COM domestic-or-commercial	HUMAN human-factor	GENERALOP general-operational
1997	CONTREL continuous-release	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1997	CONTREL continuous-release	STORAGE storage-; PACKAGE portable-transport-containers	MECHANICAL mechanical-failure	CORRODE corrosion
1997	CONTREL continuous-release	DOM/COM domestic-or-commercial	HUMAN human-factor	GENERALOP general-operational
1997	CONTREL continuous-release	STORAGE storage-; ASVESSEL storage-vessels,-atmospheric-pressure	HUMAN human-factor; EXTERNAL external-events	MAINTAIN general-maintenance; EXTNLFIRE fire events
1997	CONTREL continuous-release; DENSGSCL dense-gas-cloud	TRANSPORT transport-; PACKAGE portable-transport-containers	IMPACT impact-failure	ROADACC road-accident,-no-other-vehicle
1998	RELEASE release-; EXPLODE explosion-	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers		
1998	RELEASE release-; GASCLD gas-cloud	DOM/COM domestic-or-commercial		
1998	CONTREL continuous-release	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers	IMPACT impact-failure	HVYOBJECT heavy-object
1998	GASCLD gas-cloud; RELEASE release-	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers		
1998	CONTREL continuous-release; GASCLD gas-cloud	STORAGE storage-	HUMAN human-factor	MAINTAIN general-maintenance
1998	CONTREL continuous-release; GASCLD gas-cloud	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers		
1998	CONTREL continuous-release	DOM/COM domestic-or-commercial		

Incident Year	Incident Type	Origin	General Cause	Specific Cause
1998	CONTREL continuous-release	PROCESS process-	SERVICE services-failure	ELECTRIC electricity
1998	CONTREL continuous-release	DOM/COM domestic-or-commercial	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1998	CONTREL continuous-release	DOM/COM domestic-or-commercial		
1999	CONTREL continuous-release	TRANSFER loading,-unloading; ROADTANKER road-tanker	VREACTION violent-reaction; HUMAN human-factor	RUNAWAY runaway-reaction; GENERALOP general-operational
1999	FIRE fire-; EXPLODE explosion-	WAREHOUSE warehouse-; PACKAGE portable-transport-containers	EXTERNAL external-events	EXTNLFIRE fire
1999		DOM/COM domestic-or-commercial	EXTERNAL external-events	EXTNLFIRE fire
1999	GASCLD gas-cloud	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers	MECHANICAL mechanical-failure	VALVE leaking-or-passing-valve
1999	CONTREL continuous-release	TRANSPORT transport-; PACKAGE portable-transport-containers	IMPACT impact-failure	ROADACC road-accident,-no-other-vehicle
1999	GASCLD gas-cloud	DOM/COM domestic-or-commercial; PUMP pumps,-compressors	MECHANICAL mechanical-failure	
1999	GASCLD gas-cloud	PROCESS process-	VREACTION violent-reaction	
1999	CONTREL continuous-release; GASCLD gas-cloud	DOM/COM domestic-or-commercial	HUMAN human-factor	MANAGEMENT general-management-error
1999	GASCLD gas-cloud	DOM/COM domestic-or-commercial		
2000		STORAGE storage-	EXTERNAL external-events	EXTNLFIRE fire
2000	GASCLD gas-cloud	TRANSFER loading,-unloading; ROADTANKER road-tanker		
2000	RELEASE release-	PROCESS process-		
2000	GASCLD gas-cloud	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers	HUMAN human-factor	GENERALOP general-operational
2000	GASCLD gas-cloud	DOM/COM domestic-or-commercial; COMMTANK small-commercial-tank	HUMAN human-factor	GENERALOP general-operational
2000	FIRE fire-; GASCLD gas-cloud	PROCESS process-		
2000	GASCLD gas-cloud	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	OVERHEAT overheating
2000	CONTREL continuous-release	TRANSFER loading,-unloading; PIPEWORK pipework-	MECHANICAL mechanical-failure	
2000	CONTREL continuous-release; GASCLD gas-cloud	TRANSFER loading,-unloading; PACKAGE portable-transport-containers	HUMAN human-factor	GENERALOP general-operational
2000	RELEASE release-	TRANSFER loading,-unloading; ROADTANKER road-tanker	MECHANICAL mechanical-failure; MECHANICAL mechanical-failure	OVERPRES overpressure; VALVE leaking-or-passing-valve
2001	RELEASE release-	DOM/COM domestic-or-commercial	MECHANICAL mechanical-failure; VREACTION violent-reaction	VALVE leaking-or-passing-valve
2001	RELEASE release-	TRANSFER loading,-unloading; ROADTANKER road-tanker		
2001	RELEASE release-	PROCESS process-		

<b>Incident Year</b>	<b>Incident Type</b>	<b>Origin</b>	<b>General Cause</b>	<b>Specific Cause</b>
2001	GASCLD gas-cloud	DOM/COM domestic-or-commercial		
2001		STORAGE storage-; ASVESSEL storage-vessels,-atmospheric-pressure	EXTERNAL external-events	EXTNLEXP explosion
2001	GASCLD gas-cloud	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers	HUMAN human-factor	GENERALOP general-operational
2001	CONTREL continuous-release	STORAGE storage-; PACKAGE portable-transport-containers		
2001	RELEASE release-	DOM/COM domestic-or-commercial		
2001	GASCLD gas-cloud	TRANSFER loading,-unloading; ROADTANKER road-tanker	HUMAN human-factor; VREACTION violent-reaction	PROCEDURES procedural-failures; RUNAWAY runaway-reaction
2001	EXPLODE explosion-; FIRE fire-	STORAGE storage-; PACKAGE portable-transport-containers	VREACTION violent-reaction	CONEXP confined-explosion
2001	FIRE fire-; GASCLD gas-cloud	DOM/COM domestic-or-commercial; COMMTANK small-commercial-tank	EXTERNAL external-events	EXTNLFIRE fire
2001	GASCLD gas-cloud	DOM/COM domestic-or-commercial	HUMAN human-factor	GENERALOP general-operational
2001	GASCLD gas-cloud	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers	IMPACT impact-failure	
2002	RELEASE release-	DOM/COM domestic-or-commercial; COMMTANK small-commercial-tank	EXTERNAL external-events	CORRODE corrosion
2002	RELEASE release-	PROCESS process-; PIPEWORK pipework-	MECHANICAL mechanical-failure	FATIGUE material-fatigue
2002	RELEASE release-	TRANSPORT transport-; PACKAGE portable-transport-containers		
2002	RELEASE release-	DOM/COM domestic-or-commercial	EXTERNAL external-events; HUMAN human-factor	SABOTAGE sabotage-or-vandalism
2002	CONTREL continuous-release	PROCESS process-	EXTERNAL external-events	FLOODS flooding
2002	GASCLD gas-cloud	TRANSFER loading,-unloading	EXTERNAL external-events	FLOODS flooding
2002	CONTREL continuous-release; GASCLD gas-cloud	PROCESS process-	SERVICE services-failure	ELECTRIC electricity
2002	CONTREL continuous-release	PROCESS process-; PVESSEL process-vessels	EXTERNAL external-events	EXTNLEXP explosion
2002	EXPLODE explosion-; CONTREL continuous-release	TRANSFER loading,-unloading; PVESSEL process-vessels		
2002	CONTREL continuous-release	DOM/COM domestic-or-commercial; PACKAGE portable-transport-containers		
2002	RELEASE release-	DOM/COM domestic-or-commercial		
2002	FIRE fire-; RELEASE release-	PROCESS process-		
2002	CONTREL continuous-release; FIRE fire-	PROCESS process-	EXTERNAL external-events	EXTNLEXP explosion
2002	GASCLD gas-cloud	PROCESS process-	HUMAN human-factor	GENERALOP general-operational



Incident Year	Incident Type	Origin	General Cause	Specific Cause
2003		TRANSPORT transport-; PACKAGE portable-transport- containers	IMPACT impact-failure	ROADACC road-accident,-no- other-vehicle
2003	RELEASE release-	TRANSFER loading,-unloading; ROADTANKER road-tanker	VREACTION violent- reaction	
2003	RELEASE release-	PROCESS process-	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve
2003	RELEASE release-	STORAGE storage-; TANKCONTNR tank-container		
2003	RELEASE release-	TRANSPORT transport-; PACKAGE portable-transport- containers		
2004		WAREHOUSE warehouse-; PACKAGE portable-transport- containers	EXTERNAL external- events	EXTNLFIRE fire
2004	RELEASE release-	TRANSFER loading,-unloading; PIPEWORK pipework-	HUMAN human-factor	MAINTAIN general- maintenance
2004	RELEASE release-	WAREHOUSE warehouse-; PACKAGE portable-transport- containers		
2004	RELEASE release-	TRANSPORT transport-; PACKAGE portable-transport- containers	IMPACT impact-failure	VEHICLE other-vehicle
2004	EXPLODE explosion-	DOM/COM domestic-or- commercial; PACKAGE portable-transport-containers	VREACTION violent- reaction; HUMAN human- factor	GENERALOP general- operational
2004	RELEASE release-	STORAGE storage-; ASVESSEL storage-vessels,- atmospheric-pressure		VALVE leaking-or-passing- valve
2004	RELEASE release-	TRANSPORT transport-; PACKAGE portable-transport- containers	IMPACT impact-failure	ROADACC road-accident,-no- other-vehicle
2004	CONTREL continuous-release; EXPLODE explosion-	STORAGE storage-; PSVESSEL pressurised- storage-vessels	HUMAN human-factor	
2004	RELEASE release-	PROCESS process-; PVESSEL process-vessels		
2004	RELEASE release-	WASTE waste-storage; PACKAGE portable-transport- containers		
2004	FIRE fire-	STORAGE storage-; PACKAGE portable-transport- containers	VREACTION violent- reaction	
2004	RELEASE release-	TRANSPORT transport-; PACKAGE portable-transport- containers	IMPACT impact-failure	ROADACC road-accident,-no- other-vehicle
2005	RELEASE release-	TRANSFER loading,-unloading; HOSE hose-	MECHANICAL mechanical-failure	HOSE hose-failure
2005	RELEASE release-	STORAGE storage-; TANKCONTNR tank-container	HUMAN human-factor; VREACTION violent- reaction	GENERALOP general- operational
2005	RELEASE release-	DOM/COM domestic-or- commercial; PACKAGE portable-transport-containers		
2005	RELEASE release-	PROCESS process-; PIPEWORK pipework-	EXTERNAL external- events	EXTNLEXP explosion
2005		DOM/COM domestic-or- commercial; COMMTANK small-commercial-tank		

Incident Year	Incident Type	Origin	General Cause	Specific Cause
2005	RELEASE release-	TRANSFER loading,-unloading; PIPEWORK pipework-	MECHANICAL mechanical-failure	VALVE leaking-or-passing- valve
2005	RELEASE release-	PROCESS process-; PUMP pumps,-compressors	SERVICE services-failure	ELECTRIC electricity

Top ten types of General Causes:

General Cause	Number of incidents
MECHANICAL mechanical-failure	79
HUMAN human-factor	45
EXTERNAL external-events	29
IMPACT impact-failure	18
VREACTION violent-reaction	13
HUMAN human-factor; VREACTION violent-reaction	7
SERVICE services-failure	7
MECHANICAL mechanical-failure; HUMAN human-factor	5
HUMAN human-factor; MECHANICAL mechanical-failure	4
MECHANICAL mechanical-failure; VREACTION violent-reaction	4

Top ten types of Specific Causes:

Specific Cause	Number of incidents
VALVE leaking-or-passing-valve	28
GENERALOP general-operational	24
EXTNLFIRE fire	16
CORRODE corrosion	13
ROADACC road-accident,-no-other-vehicle	9
ELECTRIC electricity	7
EXTNLEXP explosion	6
PROCEDURES procedural-failures	6
RUNAWAY runaway-reaction	6
MAINTAIN general-maintenance	4