Click on incident name in "Event" column
to go directly to 1-Page incident summary.

Major Process Safety Incident vs Root Cause Map

(Quick Reference Guide)

Click on link to go directly
to investigation report.

IChemE
Safety & Loss Prevention
Special Interest Group

Sector		Date	Event	Country	Type	Fatalities	Injuries	Abnormal Operations	Escalation Potential	"Natech" Triggers: Earthquake	Tsunami	Flood	Cyclone/Hurricane	Extreme Cold/Ice	Root Causes – Design Factors: Hazard Identification	Process Design	Equipment/Piping Design	Materials of Construction	Instrumentation	Safety Instrumented Systems	Protective Systems	Plant Layout	Occupied Buildings	Operations Factors: Process Monitoring	Process Control	Cyber Security Breach	Alarm Management	Creeping Change	Hazard Awareness	Operations Risk Assessment	Maintenance Factors: Preventative Maintenance	Inspection/Testing	Material Degradation	Work Planning	Maintenance Risk Assessment	Energy Isolation	Control of Work	Housekeeping	Personal: Human Factors	Role Clarity	Personal Protective Equipment	Competency: Communication	Procedures	Training	Supervision/Leadership	Contractor Selection	Culture: Production over Safety	Normalisation of Deviance	Quality Assurance/Control	Management of Change	Failure to Learn	Emergency Preparedness	Process Safety Management	Regulator: Design Standards	Land Use Planning	Regulatory Compliance Audits	Investigation Reports	Links
Oil & Gas	Upstream	06-Jul-88	Piper Alpha	UK	Explosion	167	?										X				X	X												X	X	X				X	X	X	X					X		X	X					Click
		27-Jul-05	Mumbai High North	India	Explosion	22	?									X						X						X	X									X	X		X	X	X												X		
		20-Apr-10	Macondo	USA	Explosion	11	17	X							X	X	X		X	X				X						X	X								X	X		X	X	X	X						X	X	X		X	Click
		11-Feb-15	Camarupim	Brazil	Explosion	9	26	X							X	X			X			X							X	X							X		X	X		X	X	X	X		X			X		X	X			X	Click
	LNG	19-Jan-04	Skikda	Algeria	Explosion	27	74	X	X							X		?	X	?		X	X								X	X	X						X					X							X	X	X	X			
		31-May-14	Plymouth	USA	Explosion	0	5	X	X									X						X																		X	X														Click
	GPP	25-Sep-98	Longford	Australia	Fire	2	8	X							X					X				X			X		X				X						X			X	X	X			X				X	X			X	Click
	Ship	24-Mar-89	Valdez	USA	Pollution	0	0		X					X			X		X					X															X			X	X	X	X						X	X			X		
	Rail	06-Jul-13	Lac Mégantic	Canada	Fire	47	?								X		X				X							X		X			X						X				X	X	X		X			X	X	X			X		
	Downstream	04-Jan-66	Feyzin	France	BLEVE	18	84									X	X				X								X													X	X							X		X				Click
		23-Jul-84	Romeoville	USA	Explosion	17	22								X			X											X			X	X									X									X					
		22-Mar-87	Grangemouth	UK	Explosion	1	0	X	X						X		X		X	X	X								X							X				X	X	X			X			X	X		X					Click
		09-Nov-92	La Mède	France	Explosion	6	38		X						X							X	X	X								X	X		X																X	X		X	Click
		24-Jul-94	Milford Haven	UK	Explosion	0	26	X	X								X		X					X			X			X	X	X	X				X		X			X		X						X	X					Click
		21-Jan-97	Avon	USA	Runaway	1	46	X	X						X				X	X				X			X			X		X							X			X	X	X	X		X	X		X						Click
		23-Feb-99	Avon	USA	Fire	4	1	X							X													X		X	X	X	X	X		X	X					X	X	X		X			X						Click
		17-Aug-99	Izmit	Turkey	Fire	0	0		X	X						X	X	X			X	X								X			X					X			X		X								X	X			X	Click
		16-Apr-01	Humber	UK	Explosion	0	5		X						X		X														X	X	X								X								X			X				Click
		08-Apr-04	Ciniza	USA	Explosion	0	6		X								X					X								X	X		X		X	X	X		X			X						X		X	X					Click
		23-Mar-05	Texas City	USA	Explosion	15	180	X							X	X			X				X	X				X		X	X		X				X		X	X		X	X			X	X			X	X			X		Click
		28-Jul-05	Texas City	USA	Fire	0	1		X								X	X											X		X	X	X	X		X		X			X	X						X				X				Click
		05-Nov-05	Delaware City	USA	Asphyxiation	2	0																						X					X		X		X				X	X													Click
		16-Feb-07	McKee	USA	Fire	0	4		X					X	X	X				X	X	X										X			X													X					X			Click
		02-Apr-10	Anacortes	USA	Explosion	7	0	X							X		X	X	X					X				X		X			X									X					X					X	X		X	Click
		11-Mar-11	Chiba	Japan	BLEVE	0	6		X	X							X				X	X						X		X				X								X								X	X		X		Click
		02-Jun-11	Pembroke	UK	Explosion	4	1	X	X						X									X				X	X	X				X	X		X		X	X		X	X	X			X			X						Click
		06-Aug-12	Richmond	USA	Fire	0	26								X			X												X		X	X											X		X				X	X	X	X		Click
		19-Nov-13	Antwerp	Belgium	Explosion	2	0										X							X	X			X							X								X													Click
		12-Feb-14	Martinez	USA	Acid Release	0	2		X								X													X		X							X		X		X	X	X		X	X			X	X		X		X	Click
		18-Feb-15	Torrance	USA	Explosion	0	4	X	X						X				X	X		X		X					X		X	X	X		X	X	X					X		X					X	X		X				Click
		22-Nov-16	Baton Rouge	USA	Fire	0	4								X		X												X						X		X		X			X	X	X				X			X		X	X			Click
		21-Aug-17	Rotterdam	Netherlands	Fire	0	0	X												X				X			X			X							X		X			X	X										X				Click
		26-Apr-18	Superior	USA	Explosion	0	36	X	X						X			X	X			X		X	X				X	X			X									X	X				X			X	X	X	X			Click
		21-Jun-19	Girard Point	USA	Explosion	0	6		X									X		X	X								X			X	X																				X			Click
	Terminal	19-Nov-84	San Juan Ixhuatepec	Mexico	BLEVE	542	4,248										X		X	X	X	X						X		X	X											X				X			X		X	X	X	X			
		11-Dec-05	Buncefield	UK	Explosion	0	43		X						X	X			X	X		X		X	X			X		X		X			X				X			X	X	X			X			X		X	X		X		Click
		23-Oct-09	Bayamón	Puerto Rico	Explosion	0	3		X						X	X			X	X		X		X	X				X	X	X								X				X	X			X				X	X	X	X			Click
Power Gen	Nuclear	28-Mar-79	Three Mile Island	USA	Near Miss	0	0		X						X	X			X			X					X			X									X			X	X	X							X				X		
		26-Apr-86	Chernobyl	Russia	Explosion	> 30	~ 7,000	X	X						X	X	X			X									X	X									X			X	X	X			X			X	X	X			X		
		11-Mar-11	Fukushima Daiichi	Japan	Explosion	0	13		X	X	X				X				X			X								X													X	X							X	X			X		
	Coal	08-Apr-99	Gannon	USA	Explosion	3	48																							X				X	X	X		X			X	X		X										X			
		10-Nov-07	Dallman	USA	Explosion	0	0	X	X								X	X	X	X	X		X							X	X		X									X	X				X										
Petrohemical	Manufacture	01-Jun-74	Flixborough	UK	Explosion	28	104	X	X													X	X						X	X		X	X		X			X			X	X	X		X		X	X		X	X		X			
		23-Oct-89	Pasadena	USA	Explosion	23	314	X									X		X		X	X									X			X	X	X					X	X	X			X		X	X	X	X					
		21-Sep-92	Castleford	UK	Fire	5	201	X														X	X						X					X		X		X					X	X					X	X	X	X				Click
		01-Feb-94	Ellesmere Port	UK	Fire	0	18		X						X		X		X										X		X	X	X								X	X	X							X	X	X			Click
		27-Mar-98	Hahnville	USA	Asphyxiation	1	1								X														X	X							X					X														Click
		13-Jun-13	Geismar	USA	BLEVE	2	167	X							X														X	X											X	X							X	X		X				Click
		03-Jun-14	Moerdijk	Netherlands	Explosion	0	2	X							X				X	X					X				X										X			X	X	X						X	X	X	X			X	Click
		31-Aug-17	Crosby	USA	Decomposition	0	21						X	X	X						X	X							X	X	X								X			X									X	X	X	X		Click
Agrochemical	Manuf.	10-Jul-76	Seveso	Italy	Toxic Release	0	~ 500	X	X						X	X			X	X					X				X	X								X			X	X					X				X	X	X			Click
		03-Dec-84	Bhopal	India	Toxic Release	> 15,000	>550,000	X							X	X	X	X		X	X			X	X		X	X	X	X	X	X	X	X	X		X		X	X		X	X	X		X	X		X	X	X	X		X	X	
		21-Sep-01	Toulouse	France	Explosion	31	2442		X						X			X				X							X	X					X			X				X	X							X	X	X		X	X	Click
		15-Nov-14	La Porte	USA	Toxic Release	4	0	X							X		X				X		X				X		X	X	X						X		X		X	X					X		X	X	X	X	X	X	Click
	Store	17-Apr-13	West	USA	Explosion	15	> 160		X						X			X				X							X						X								X								X	X		X	X	Click
Pharma	Manuf.	04-Jan-92	Grimsby	UK	Runaway	0	0	X	X						X	X			X						X			X		X												X						X		X						
		29-Jan-03	Kinston	USA	Explosion	6	38								X		X				X		X						X	X								X			X	X	X									X	X			Click
		28-Apr-08	Cork	Ireland	Runaway	1	1								X	X	X													X									X			X	X									X		X			Click
Water	Dist	23-May-84	Abbeystead	UK	Explosion	16	28	X							X	X			X										X													X	X							X				X			Click
	Treat.	06-Jul-88	Camelford	UK	Pollution	1	~ 400								X							X								X								X			X	X	X							X	X					Click
		05-Apr-93	Milwaukee	USA	Disease	69	>403,000								X	X								X	X																		X			X				X						Click
		11-Jan-06	Bethune Point	USA	Explosion	2	1								X		X	X											X				X		X		X							X	X								X				Click
Food		03-Sep-91	Hamlet	USA	Fire	25	54								X			X	X	X	X	X	X									X			X				X			X				X	X		X	X	X	X	X		X	Click
		11-Apr-03	Louisville	USA	Explosion	1	0		X						X		X		X		X			X	X				X		X	X									X	X	X							X					X	Click
		07-Feb-08	Port Wentworth	USA	Explosion	14	36								X	X					X								X	X								X	X			X	X	X			X		X	X	X	X			X	Click
Gas	H2	01-Jun-19	Santa Clara	USA	Explosion	0	2		X								X	X			X	X														X			X			X	X													Click
Steel	Fe	08-Nov-01	Port Talbot	UK	Explosion	3	12								X	X			X					X				X	X	X	X	X								X		X		X	X					X		X	X				Click

I recommend printing on A3 paper for easier reading

P. Marsh - XBP Refining Consultants Ltd.