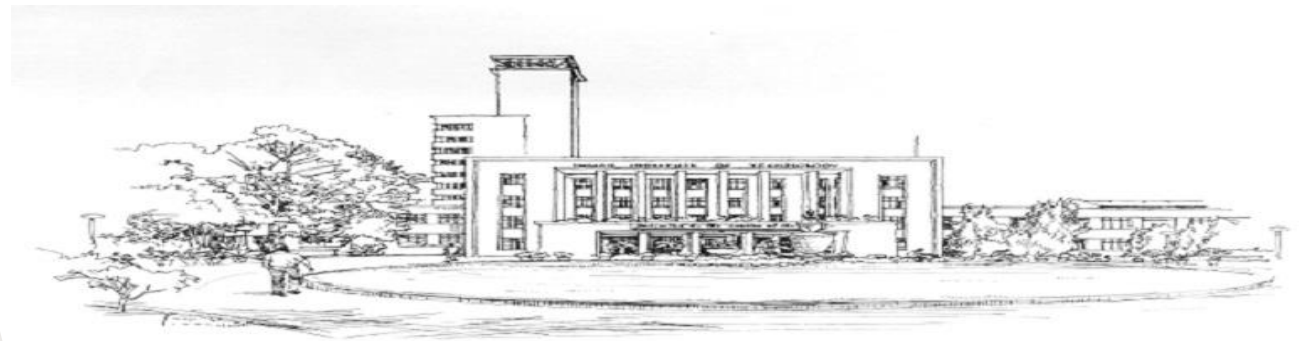


CENTRE OF EXCELLENCE IN SAFETY ENGINEERING AND ANALYTICS (COE-SEA)

INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

A CALENDAR FOR THE YEAR 2022



The Centre of Excellence in Safety Engineering and Analytics (CoE-SEA) for the year 2022 commemorates and looks back on 12 major industrial artificial or human-caused catastrophes that have been marked as the worst disasters in world history to learn from these accidents. These accidents are a result of unsafe and unprofessional human behaviour and circumstances.

Engineering safety concepts provides detailed approaches and modes for accident reduction by using a risk management process to identify and design out hazards. CoE-SEA provides the framework for both safety engineers and industrial design engineers to develop intrinsically safe equipment, systems, processes and facilities. The centre emphasises the importance of staying safe and avoiding failure.

Let the new year focus on safety and the prevention of risks and hazards in order to engineer a trouble-proof and better designed workplace to prevent accidents.

JANUARY 2022

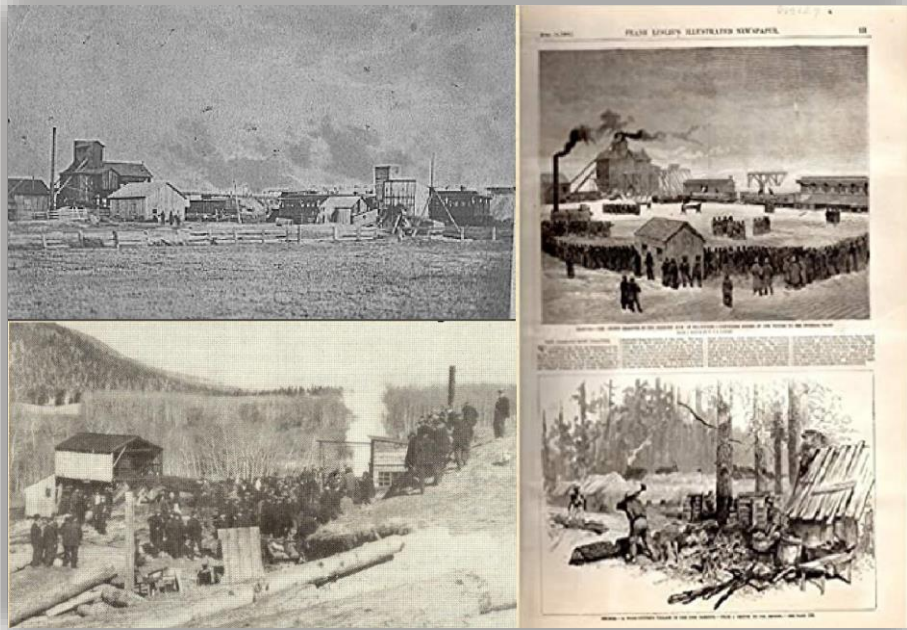


CHICAGO CRIB DISASTER

An explosion that took place on January 20, 1909, at the temporary wooden crib of the submarine tunnel at Chicago, that killed about 60 men, either burned to death or drowned in the icy waters of the Michigan lake. 39 workers had been rescued. An official cause of the fire was never determined and is still unclear.

SUN	MON	TUE	WED	THUR	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26 Republic Day	27	28	29
30	31					

FEBRUARY 2022



DIAMOND MINE DISASTER

Diamond coal mine at Braidwood on February 16, 1883, flooded, drowning 74 coal miners in it. After 38 days of pumping, mine was emptied of water and preparations made to raise the bodies. Out of 74 known victims only 28 bodies were recovered.

SUN	MON	TUE	WED	THUR	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

MARCH 2022

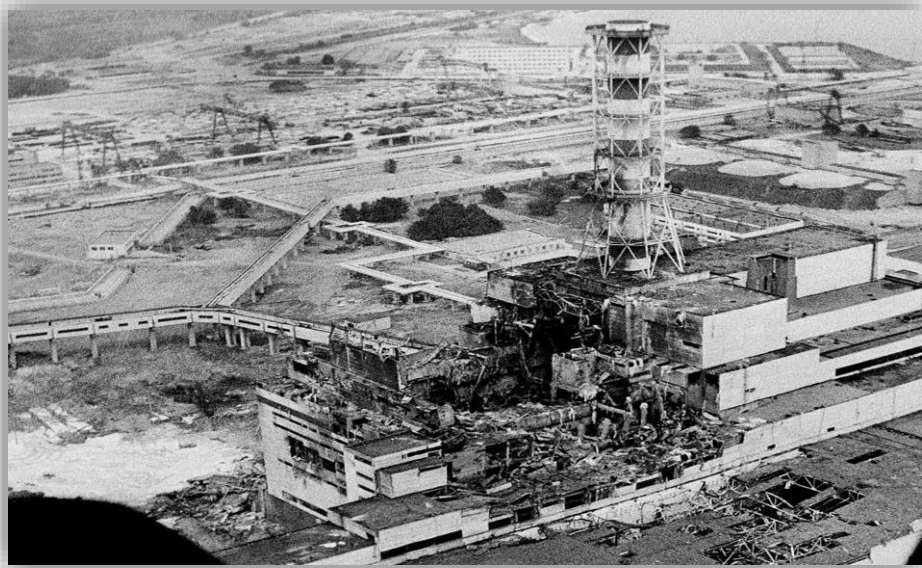


FUKUSHIMA DAIICHI NUCLEAR DISASTER

Devastating nuclear power plant explosion in the town of Okuma in Fukushima, Japan on March 11, 2011. The accident was triggered by the Tohoku Earthquake and the resulting tsunami. At least 16 workers were seriously injured and thousands suffer from the exposed radiation.

SUN	MON	TUE	WED	THUR	FRI	SAT
		1	2	3	4	5
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13	14	15	16	17	18 Holi	19
20	21	22	23	24	25	26
27	28	29	30	31		

APRIL 2022



CHERNOBYL NUCLEAR DISASTER

The worst nuclear disaster in the history both in casualties and cost. A combination of operator negligence and critical design flaws had made the reactor primed to explode on April 16, 1986. This released considerable airborne radioactive contamination. About 1,17,000 people evacuated from the area. 2 engineers were killed in the explosion and 2 severely burned. Many suffered from radiation-induced cancer and died. Approximately 2600km² area is marked as Chernobyl Exclusion Zone.

SUN	MON	TUE	WED	THUR	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14 Mahavir Jayanti	15 Good Friday	16
17 Easter	18	19	20	21	22	23
24	25	26	27	28 World Safety Day	29	30

MAY 2022



SOMA MINE DISASTER

An explosion at Eyzek coal mine in Soma on May 13, 2014, caused an underground mine fire, which burned until May 15. The cause for explosion is unclear. In total, 301 workers were burned to death, marking it the worst mine disaster in Turkey's history. The accident injured 80 workers and trapped nearly 600 workers in the mine, causing most of the victims to die of carbon monoxide poisoning.

SUN	MON	TUE	WED	THUR	FRI	SAT
1	2	3 Id-ul-Fitr*	4	5	6	7
8	9	10	11	12	13	14
15	16 Buddha Purnima	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

*Depending on the appearance of the moon

JUNE 2022



FLIXBOROUGH DISASTER

Massive explosion at the chemical plant close to village of Flixborough, on June 1, 1974, killed 28 and seriously injured 36 out of the 72 workers on site at the time. Cause of the catastrophe is due to the leakage of cyclohexane which subsequently found a source of ignition. 18 fatalities were reported. The fire burned for several days hampering the rescue works.

SUN	MON	TUE	WED	THUR	FRI	SAT
			1	2	3	4
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

JULY 2022



PIPER ALPHA EXPLOSION

Piper Alpha, an oil platform located in the North Sea, exploded and sank on July 6, 1988, killing 165 men on board and 2 rescue workers. 61 workers escaped and survived, 30 bodies were never recovered. The accident is marked the worst offshore oil disaster. Cause of the accident ruled to be the maintenance work carried out on one of the high pressure condensate pumps and safety valve, which led to a leak in condensates that later resulted in explosion.

SUN	MON	TUE	WED	THUR	FRI	SAT
					1	2
3	4	5	6	7	8	9
10 Bakrid*	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

*Depending on the appearance of the moon

AUGUST 2022



BEIRUT EXPLOSION

Huge explosion at the Port of Beirut in the capital city of Lebanon on August 4, 2020, killing at least 218, 7000 injuries and huge amount in property damage. It is considered one of the most powerful artificial non-nuclear explosions in the history. The catastrophe occurred due to the fire in the warehouse which stored 2750 tonnes of ammonium nitrate without proper safety measures. At least 150 people became permanently disabled and around 3,00,000 people homeless.

SUN	MON	TUE	WED	THUR	FRI	SAT
	1	2	3	4	5	6
7	8	9 Muharram	10	11	12	13
14	15 Independence Day	16	17	18	19 Janmashtami	20
21	22	23	24	25	26	27
28	29	30	31			

SEPTEMBER 2022

SUN **MON** **TUE** **WED** **THUR** **FRI** **SAT**



OPPAU EXPLOSION

An explosion at BASF chemical plant in Oppau, Germany on September 21, 1921, killed around 600 people and injured about 2000 more. Primary cause is due to explosion of 4500 tonnes of a mixture of ammonium sulphate and ammonium nitrate fertilizer stored in tower silo. 500 bodies were recovered within 48 hours of the accident and the final death toll recorded being over 560 people.

				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

OCTOBER 2022



PHILLIPS DISASTER

A devastating series of explosions and fire originated at the Phillips Petroleum Company's Houston Chemical Complex (HCC) in Texas on October 23, 1989. The explosion killed 23 employees and injured 314.

The accident resulted from release of more than 85,000 pounds of extremely flammable process gases during maintenance operations on one of the plant's polyethylene reactors.

SUN	MON	TUE	WED	THUR	FRI	SAT
						1
2 Gandhi Jayanti	3 Dussehra (Maha Astami)	4 Dussehra (Maha Nabami)	5 Dussehra (Vijaya Dashami)	6 Dussehra	7	8
9 Id-E-Milad	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24 Diwali	25	26	27	28	29
30	31					

NOVEMBER 2022



SAN JUANICO DISASTER

An industrial disaster caused by a massive series of explosions at the Liquefied Petroleum Gas (LPG) tank farm in San Juanico, Mexico on November 19, 1985. The explosion destroyed the facility, killed 500-600 people and burned 5000-7000 others. The disaster is marked as the deadliest industrial disaster in world history. The catastrophe was caused by a gas leak, likely caused by a pipe rupture during transfer operations.

The explosion shock wave destroyed much of the town.

SUN	MON	TUE	WED	THUR	FRI	SAT
		1	2	3	4	5
6	7	8 Guru Nanak Jayanti	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

DECEMBER 2022



BHOPAL GAS TRAGEDY

A gas leakage, which is considered among the world's worst industrial disaster, of about 45 tons of dangerous methyl isocyanate gas on the night of 2-3 December 1984 at Union Carbide India Limited (UCIL) pesticide plant in Bhopal, India. Over 5,00,000 people were exposed to MIC gas, killing around 20,000. Investigations prove that substandard operating and safety procedures at the understaffed plant led to the disaster.

SUN	MON	TUE	WED	THUR	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25 Christmas	26	27	28	29	30	31