



# Prevention of Major Accidents

*Stavanger – October 2018 – Terry Cooper*

# EINSTEIN



*“We cannot solve our problems with the same thinking that we used when we created them”*



## WRONG PERCEPTION “NOTHING SINCE MACONDO”

WHEN	WHERE	ACCIDENT DESCRIPTION	IMPACT
27/10/2016	IRAN/CASPIAN SEA	HELICOPTER CRASH AT SEA NIOC	5 fatalities
24/10/2016	RUSSIA/SIBERIA	HELICOPTER CRASH ON LAND ROSNEFT	19 fatalities
16/12/2016	AZERBAIJAN/CASPIAN SEA	PLATFORM COLLAPSE SOCAR	1 fatality, 9 missing, Total loss of platform
26/09/2016	ANGOLA	HELICOPTER CRASH AT SEA CHEVRON	6 fatalities, 1 helicopter
29/04/2016	NORWAY	HELICOPTER CRASH AT SEA	13 fatalities, 1 helicopter
04/12/2016	AZERBAIJAN/CASPIAN SEA	HIGH PRESSURE SUBSEA PIPELINE DAMAGED/WEATHER SOCAR	32 fatalities
01/04/2015	MEXICO OFFSHORE	FIRE INSIDE 6 PLATFORMS COMPLEX / CORROSION PIPELINE PEMEX	4 fatalities , 3 missing, > 1 Billion \$ property and production loss, massive oil spill
11/02/2015	BRAZIL OFFSHORE	EXPLOSION INSIDE FPSO HULL, PROCEDURAL , DESIGN PETROBRAS	9 fatalities, 28 Injured, > 1 Billion \$ property and production loss
24/08/2013	UK	HELICOPTER CRASH WHILE LANDING TOTAL	4 fatalities, 12 injured and 1 helicopter
07/01/2013	ANGOLA	JACK UP SINKING/CAPSIZE	1 missing, 182 Million \$ property damage
04/12/2011	MEXICO OFFSHORE	FLOTEL SINKING PEMEX	Total loss of Flotel 160 Million \$
18/09/2012	MEXICO ONSHORE	ONSHORE GAS PLANT REYNOSA PEMEX, EXPLOSION VCE	31 fatalities, 42 Injured
02/04/2011	UK	FPSO 10 ANCHORS FAILURE DUE TO STORM WEATHER	450 Million \$
05/13/2010	VENEZUELA	DRILLING RIG SINKING	235 Million \$
21/04/2010	US GULF OF MEXICO : MACONDO	DEEP SEA BLOW OUT BP	11 fatalities, 5 million barrels to sea, > 62 Billion \$

**IN 6 YEARS, AT LEAST 14 MAJOR ACCIDENTS, 137 FATALITIES**



# MAJOR RISK IS NOT ONLY FIRE AND EXPLOSION

Since Macondo:

- 5 helicopter crashes (47 fatalities)
- 5 anchors failure, platform collapse or sinking (11 fatalities, at least 2 billions USD)
- 4 fire or explosions (79 fatalities, at least 2 billions USD)

Fire and explosion statistically causes the most fatalities and costs, but:

- helicopter crashes cause almost the same amount of fatalities
- sea related structural issues are as costly (with significant amount of fatalities also...)

# Process Safety Events – Loss of Containment

10 years – 128 fatalities

Ignition - 96

Struck by - 28





*“Concern for man and his fate must always form the chief interest of all technical endeavours. Never forget this in the midst of your diagrams and equations”*