

Notes:
1. A cyber attack may initiate or escalate an accident event or disable a safety critical system (barrier).

Personnel Safety Hazards

**MAJOR ACCIDENT HAZARDS
UPSTREAM OFFSHORE**

Chart Does Not Include Environmental Hazards

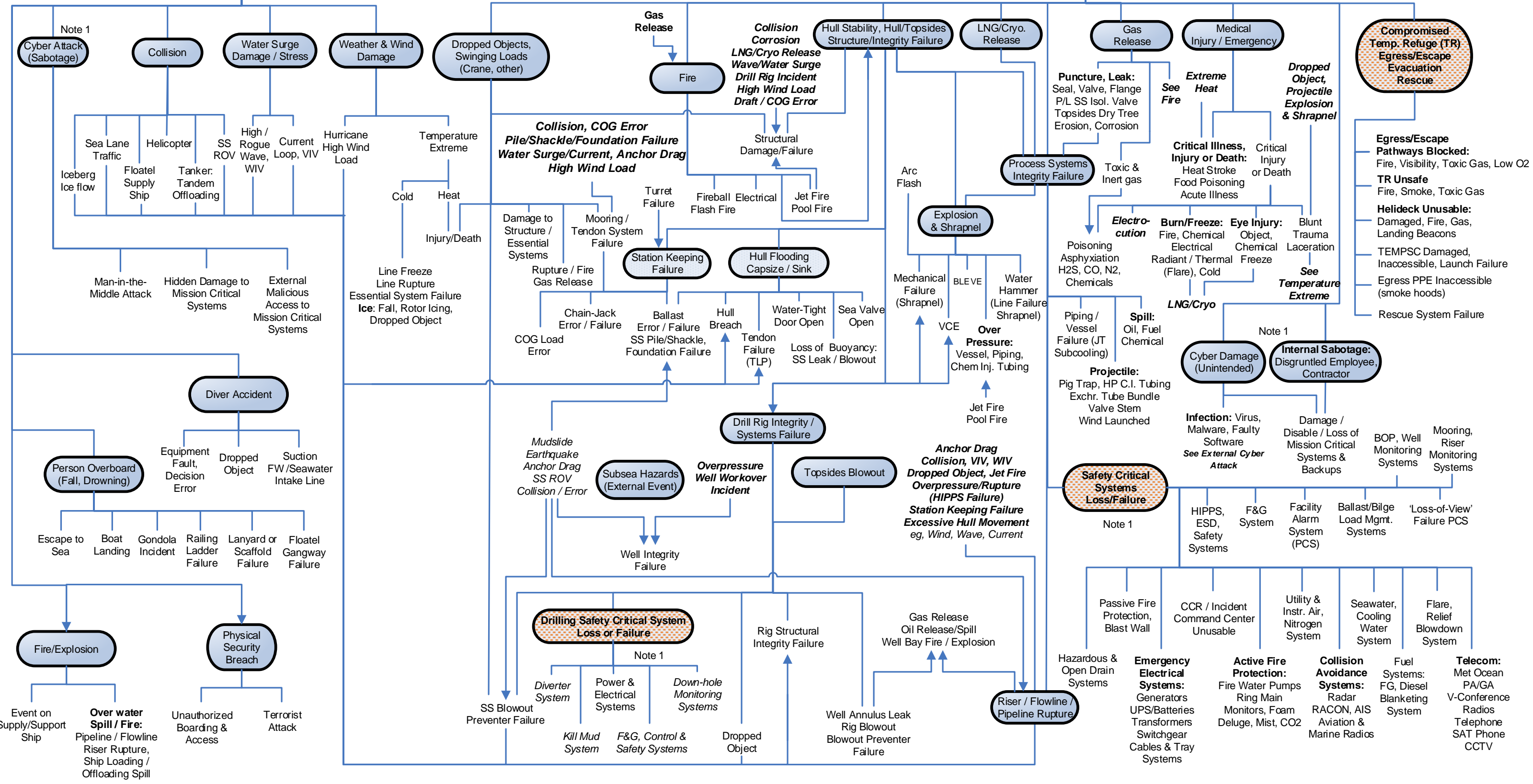
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- LEGEND**
- BLEVE – Boiling Liquid Expanding Vapor Explosion
 - COG - Center of Gravity
 - FG – Fuel gas
 - HIPPS – High Integrity Pressure Protection System
 - PCS – Process Control System
 - P/L - Pipeline
 - SS – Subsea
 - TEMPSC –Totally Encl. Mtr.Propelled Survival Craft
 - TLP – Tension Leg Platform
 - TR - Temporary Refuge/Safe Haven
 - TTR – Top Tension Riser
 - VCE – Vapor Cloud Explosion
 - VIV – Vortex Induced Vibration
 - WIV – Wave Induced Vibration

Major Accident Hazards
Safety Critical Systems Failures

External Hazards

Onboard Hazards



Compromised Temp. Refuge (TR) Egress/Escapes Evacuation Rescue

- Egress/Escapes Pathways Blocked:** Fire, Visibility, Toxic Gas, Low O2
- TR Unsafe:** Fire, Smoke, Toxic Gas
- Helideck Unusable:** Damaged, Fire, Gas, Landing Beacons
- TEMPSC Damaged, Inaccessible, Launch Failure
- Egress PPE Inaccessible (smoke hoods)
- Rescue System Failure

Cyber Damage (Unintended) Internal Sabotage: Disgruntled Employee, Contractor

- Infection:** Virus, Malware, Faulty Software
- Damage / Disable / Loss of Mission Critical Systems & Backups:** BOP, Well Monitoring Systems, Mooring, Riser Monitoring Systems
- 'Loss-of-View' Failure PCS:** HIPPS, ESD, Safety Systems; F&G System; Facility Alarm System (PCS); Ballast/Bilge Load Mgmt. Systems

Safety Critical Systems Loss/Failure

- Passive Fire Protection, Blast Wall**
- CCR / Incident Command Center Unusable**
- Utility & Instr. Air, Nitrogen System**
- Seawater, Cooling Water System**
- Flare, Relief Blowdown System**
- Hazardous & Open Drain Systems**
- Emergency Electrical Systems:** Generators, UPS/Batteries, Transformers, Switchgear, Cables & Tray Systems
- Active Fire Protection:** Fire Water Pumps, Ring Main, Monitors, Foam, Deluge, Mist, CO2
- Collision Avoidance Systems:** Radar, RACON, AIS, Aviation & Marine Radios
- Fuel Systems:** FG, Diesel, Blanketing System
- Telecom:** Met Ocean, PA/GA, V-Conference, Radios, Telephone, SAT Phone, CCTV