QUANTITATIVE RISK ASSESSMENT
Quantitative Risk Assessment

The best practices for QRA

Unconventional hazard:
1) Large inventories
2) Long duration
3) Wide impacted (unconfined) areas

TEA developed a complete methodology for Risk Assessment associated with severe accidents for the O&G & Petrochemical industry:

FRA & Other Risk Studies

Fire Risk Analysis and other risk related activities

TEA currently performs Fire Risk Analysis in consistency with Company and best international standards.

The effect of engineering barriers (i.e. Emergency Depressurization and Blowdown systems) is taken into account to evaluate real discharge/fire characteristics (reduced fire impact distances means lower PFP requirements).

Sensitivity risk analysis for critical targets would allow for the characterization of PFP requirements (type and duration).

TEA has a consolidated experience in providing the following additional risk studies:
- Emergency Systems Survivability Analysis
- Escape Evacuation and Rescue Analysis
- SIMOPS Risk Analysis
- Building Risk Assessment
- Boat/Ship Impact Study
- Dropped Object Study
- SSIV location optimization
A Risk Assessment Tool, TEARisk® has been specifically developed to support Onshore and Offshore Facilities Design Risk Analysis. TEARisk may be used to support both QRA and FERA analysis. TEARisk® is extremely flexible and allows for a robust definition of the processed risk sources. TEARisk® would evaluate risks for both linear and punctual sources and quantify risks associated to fires, explosions and toxic dispersions. Risk sources may be characterized at Unit/Area level (more generic & less expensive) or by Equipment (refined approach). Due to its multilayer structure, risks may be quantified for any hazard and for any equipment independently.

Explosion Modelling & Exceedance Analysis

TEA performs Explosion Risk Assessment (consistent with CCPS and COMAH proposed approaches) supported by alternative Vapour Cloud Explosion models.
1) VCE Modelling approach with Baker - Strehlow-Tang or Multi-energy models
2) CFD Dispersion, Ventilation and Explosion Modelling (FLACS)
3) VCE analysis results may be included into TEARisk software in terms of explosion risks for personnel (QRA) and assets (FERA).

Exceedance Analysis assesses, on a probabilistic basis, the expected blast overpressure loads on highly sensitive targets (i.e. Buildings, Control Room, Reactors etc...) and eventually identifies their expected Design Loads (DALs). Exceedance Analysis would generally identify less stringent Blast Design Loads with respect to Consequence Based approach in a structured and auditable way.