



Operational Excellence Services

Health · Safety · Environment
(HSE)

HSE Risk Management



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HSE Risk Management

Do you have any of these issues?

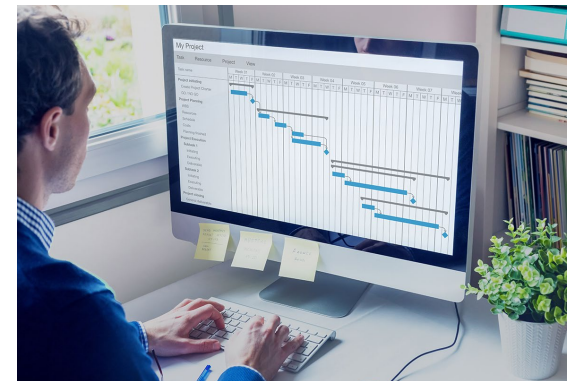
- ☹️ **Formalizing facility safety**
- ☹️ **Process and operational safety concerns**
- ☹️ **High insurance fees**

HSE Risk Management Solutions

- Justify safety using a prescribed process, which includes:
 - Formal Safety Assessment
 - Quantitative Risk Analysis (QRA)
 - Hazard Identification (HAZID)
 - Hazard and Operability Studies (HAZOP)
 - Layer of Protection Analysis (LOPA)
 - Bow-tie Analysis
 - Operational Hazard Assessment/Reduction Study
 - HSE Management System Review

Assessment		Potential Hazards		Previous Hazards (Incidents/Near Misses)
		General	Process	
Hazard Identification		HAZID	HAZOP	OHR *
Risk Assessment	Qualitative	HAZID	HAZOP	OHR *
	Semi-Quantitative	LOPA		
	Quantitative	Consequence Analysis / QRA		

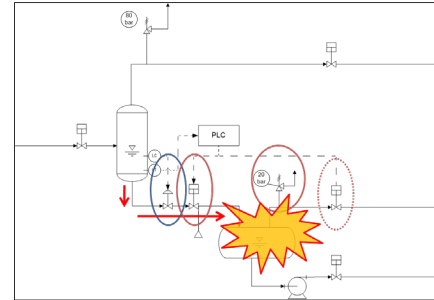
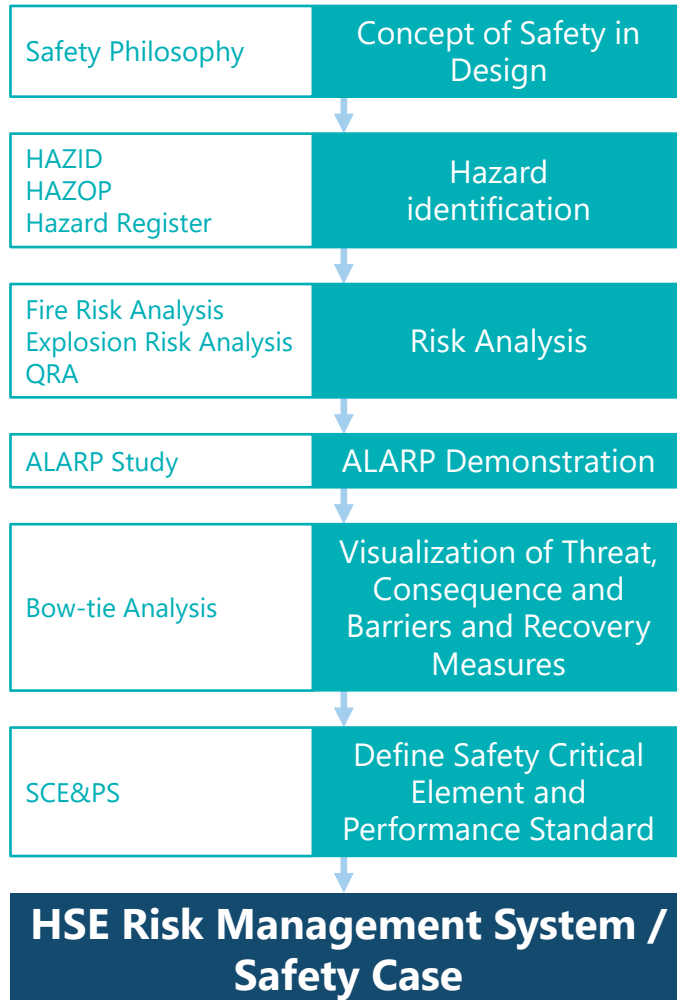
* OHR : Operational Hazard Reduction Study



Combination of Desk-top Study and Workshop

HSE Risk Management

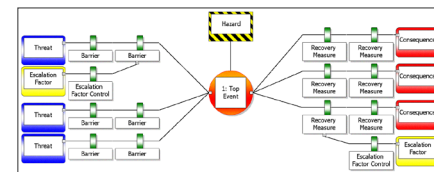
Workflow & Results



Hazard Identification in P&ID



QRA



Bow-tie Diagram

Our Strengths

- Professional Safety, Process, Control, Mechanical, Operation and Maintenance Teams
- Top global experience of EPC execution
Plant types - Refinery, Gas Processing, LNG, Chemical
Plant locations – Onshore, Offshore
Clients – IOC, NOC
- Huge record of HAZOP and Operational Hazard Reduction

Our Experiences

10+
Cases

10+ HAZOP revalidation and OHR for operating plant

500+
Cases

500+ Process safety plant design

Wide Range of HSE Risk Management Support Services (Last 10 years)

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Year	Country	Facility Type	Consultation Category
2012	Saudi Arabia	Oil Stabilization, NGL Recovery, Storage	Fire Safety Review
2012	Algeria	Oil Production	Fire Safety Review
2013	Japan	LNG Receiving Terminal	HAZID, HRA, SIL, Fire Safety Review, QRA, Bow-tie, ALARP, SCE&PS, SIMOPS/MOPO, Noise Study, PSSR, Safety Case
2014	Japan	Gas Processing	HAZID, HAZOP, SIL, Consequence Analysis, Bow-tie, SIMOPS, ALARP, SCE, Safety Case
2014	Russia	Offshore Gas Field	FEED Design HSE Assessment
2014	Japan	Pipeline (including valve station)	HAZID, SCE&PS
2014	Brunei	Methanol Plant	PSM Assessment
2014	Japan	Drilling	HAZID, ENVID, HRA, SIMOPS, QRA, Bow-tie, MOPO, Safety Case
2015	Japan	Gas Booster Station	HAZID, SIL, Fire Safety Review, QRA, Bow-tie, ALARP, SCE&PS, MOPO, Safety Case
2016	Japan	Offshore Gas Field	HAZID, HAZOP, FERA
2016	Japan	LNG Receiving Terminal	QRA (Support)
2016	Kuwait	GOSP	Operational Safety Design Review
2016	Japan	Valve Station	QRA
2017	Japan	Gas Processing	Design Review, HAZID, HAZOP
2017	Japan	Refinery	SIL/LOPA Education and Implementation Support
2019	Japan	Refinery	HAZOP, SIL/LOPA Education and Implementation Support
2021	Japan	Refinery	HAZOP Training, HAZOP Validation
2021	Japan	Distillery	HAZID, HAZOP/LOPA Training & Implementation Support, Consequence Analysis
2021	Japan	Ethylene	RBPS Implementation, HAZID, HAZOP/LOPA Training and Implementation Support, Consequence Analysis
2022	Japan	Pipeline (including valve station)	HAZID, HAZOP, SIL, QRA, Bow-tie, ALARP, SCE&PS, SIMOPS, MOPO, Noise Study, Safety Case