



Operational Excellence Services

Health · Safety · Environment
(HSE)

CoreSafety®

Application for Risk-Based
Process Safety

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➡ <https://www.jgc.com/en/business/epc/operation-maintanance/service/>

Access to CoreSafety

➡ <https://sales.coresafety.biz/en/>



CoreSafety® -Risk-Based Process Safety Application



Do you have any of these issues?

- Only limited persons know where PHA(*) data such as HAZID, HAZOP, LOPA(**) is stored
- PHA data is not actively used for optimization of asset management program
- Risk profile of facilities is not shared in organization

(*)PHA : Process Hazard Analysis

(**) HAZID : Hazard Identification Study
HAZOP : Hazard and Operability Studies
LOPA : Layer of Protection Analysis

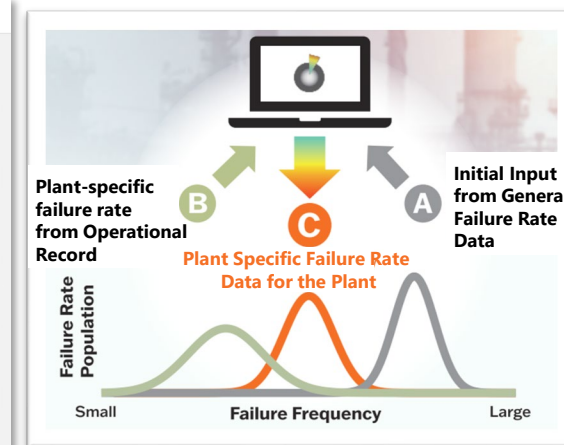
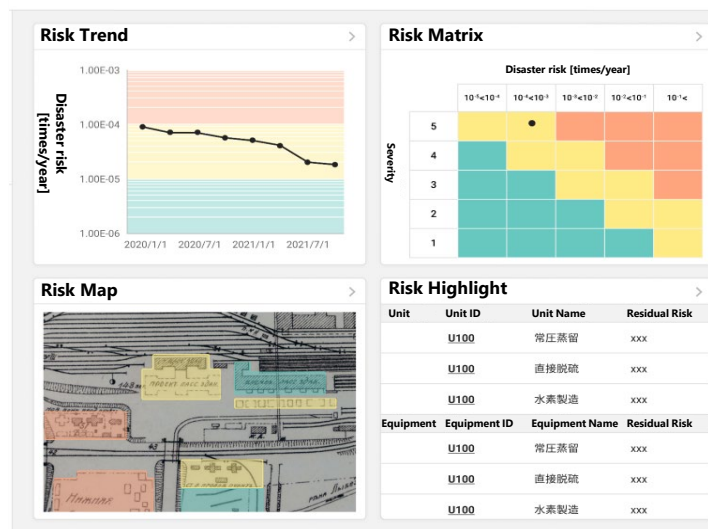
Functional Features

CoreSafety®, one of JGC in-house application, can summarize and register PHA results to visualize Risk Profile, and easily accessed through a web browser

- Risk Dashboard
- Up-to-date risk by Bayesian Update(***)
- Fault Schedule (i.e., hazard register)
- Functional Requirements' management tied with risk scenario
- Safety Performance KPI monitoring

(***) A statistical method that updates the probability for a hypothesis as more evidence or information becomes available.

Risk Dashboard

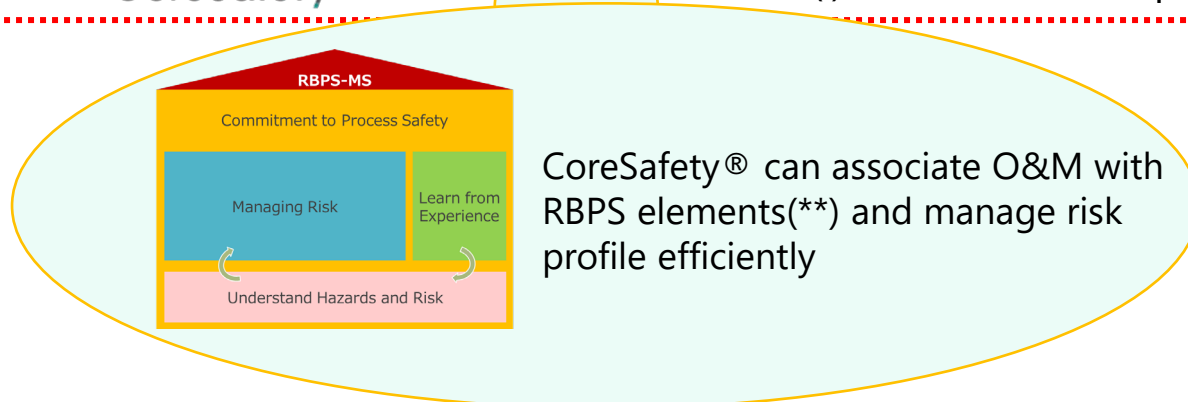
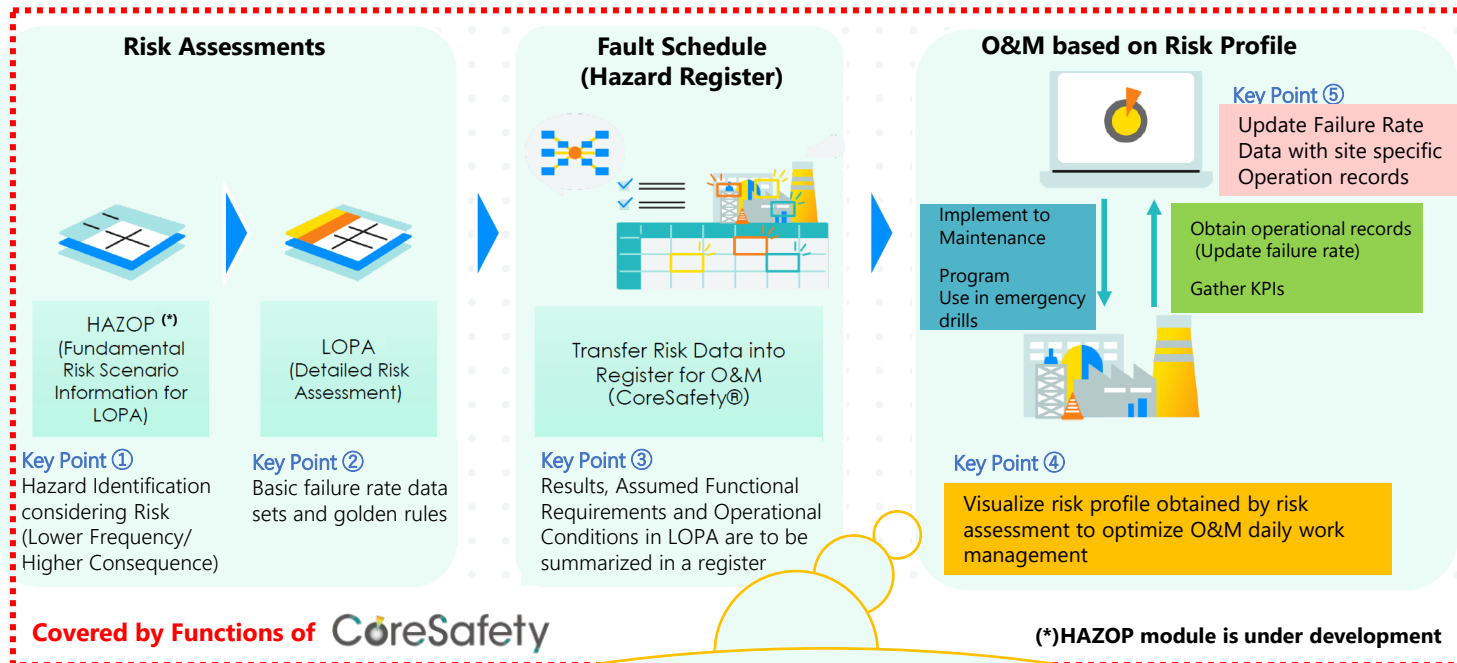


Bayesian Update

Fault Schedule

Unit	P&ID	Equipment Tag	Equipment Name	Initiating Event Group	Loss of Containment	Cumulative Initiating Event Frequency [times/year]
▶ 041	41-PID-PS-1160	041-T-1003	Depropanizer Column	気相出口閉塞	圧力超過なし (内部破損/Process upset)	5.04 x 10 ⁻¹
▶ 041	41-PID-PS-1160					3.29 x 10 ⁻¹
▼ 041	41-PID-PS-1160					1.65 x 10 ⁻¹
Initiator Tag		Initiator Name				Initiator Frequency [times/year]
▼ 041-FV-2710		041-T-1002塔底 コンデンサセ流量調整弁				1.65 x 10 ⁻¹
Consequence Type		Severity	Consequence			Residual Risk [times/year]
Safety		4	• Contributors of a risk scenario (i.e, failure rate of initiators, probability of failure on demand of safeguards) • Residual risks for each consequence type (Safety, Economic loss, Environment)			Risk Scenario
Economic loss		3				
Environment		2				
▼ 041	41-PID-PS-1160	041-T-1003	Functional Requirement of the initiator and safeguards for reducing the risk (i.e., maintenance plan)			Measures

Implementation of Smart RBPS (Risk Based Process Safety)



(**)RBPS Elements are suggested by AIChE CCPS (American Institute of Chemical Engineers Center for Chemical Process Safety)

Advantages of CoreSafety®

- **Assured by Collaborative Research Projects:**
Smart RBPS methodology taken in CoreSafety is assured by a collaborative research project involving academia, regulatory bodies, and industry in Japan.
- **Risk Profile Library:**
 - 1. Based on our experience**
Be built on extensive Process Safety Management (PSM) and Process Hazard Analysis (PHA) experience in global Oil & Gas, Chemical, and Nuclear industry projects.
 - 2. Standardized Profiles**
Provides standardized risk profiles for various equipment types (e.g., pumps, fractionation columns, drums).
 - 3. Efficient Assessment**
Enables efficient risk assessments without needing detailed design information.

e.g.) Two Phase Separator
Standardized **P&ID** and **Risk Scenario** are available for risk assessments

CoreSafety® -Risk-Based Process Safety Application

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User Benefits

BEFORE

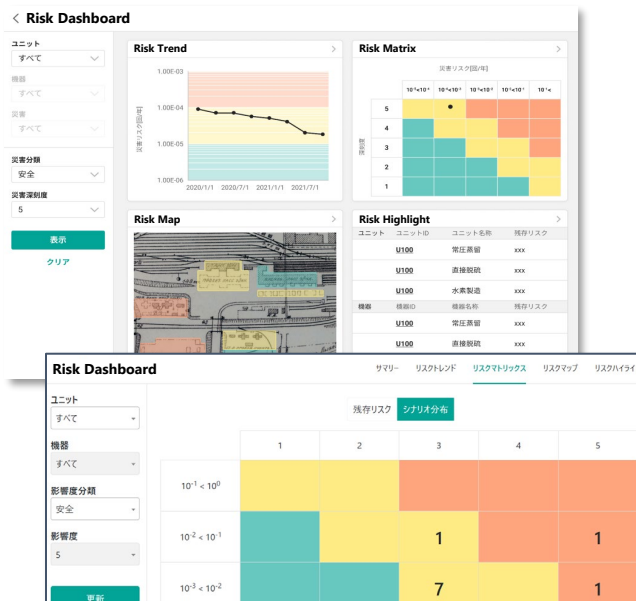
PHA by Excel/Paper

Implementation CoreSafety

AFTER

RBPS's cycle is improving

Scenario Number	Equipment Number	Scenario Title: Hazare Storage Tank Overflow. Spill not contained by the dike.
2a		
Date	Scenario Number 2a	Equipment Number
Consequence Description/Category	Scenario Title: Hazare Storage Tank Overflow. Spill not contained by the dike.	
Risk Tolerance Crite (Category or Freque	Date	Scenario Title: Hazare Storage Tank Overflow. Spill not contained by the dike.
Initiating Event (typically a frequency)	Consequence Description/Category	Frequency
Enabling Event or Condition	Risk Tolerance Crite (Category or Freque	
Conditional Modifi	Initiating Event (typically a frequency)	
Frequency of Unmit Independent Protect	Enabling Event or Condition	
Safeguards(non-IPL)	Conditional Modifiers (i	
Total PFD for all IPL	Frequency of Unmit Independent Protection I	
Frequency of Mitigat Risk Tolerance Crite	Safeguards(non-IPL)	
Actions Required to Meet Risk Tolerance Criteria	Total PFD for all IPL	
Notes	Frequency of Mitigat Risk Tolerance Crite	
References (links to LOPA analyst (and team members, if applicable):	Actions Required to Meet Risk Tolerance Criteria	
	Notes	
	References (links to orig LOPA analyst (and team members, if applicable):	



- Visualizes Risk and Optimizes O&M Tasks
- Brings "Risk Data" to the center of RBPS Management System.

Actual Benefits of adopting CoreSafety®

Achievement of ALARP(*) Decision for Higher Risk Items

(*)ALARP : As Low As Reasonably Practicable

Improved Response and Procedure for Safety Critical Alarms by efficient training utilizing CoreSafety®

High Integrity and Reliability of Equipment and Safety Systems

Enhanced Risk Management at MOC and PTW (**)

(**)MOC : Management Of Change, PTW : Permit To Work

Sophisticated Emergency Planning for Designated Process Incidents