

CHEF y RAST: herramientas de apoyo para análisis de riesgos.

Adriana M. Gómez
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Que es CHEF?



Chemical Hazard Engineering Fundamentals (C.H.E.F.)

Junto con RAST es un conjunto de herramientas desarrollado por Dow Chemical , para ser utilizadas como ayuda en los análisis de riesgos de proceso

CHEF es una compilación de cálculos y métodos que son utilizados en RAST,

CHEF incluye :

- Identificación de peligros químicos (flamabilidad, toxicidad y reactividad) y operacionales.
- Técnicas para el desarrollo de escenarios de incidentes
- Modelos para la estimación de tasas de goteo (leak rate), dispersión de vapor y explosiones
- Modelos para estimar efectos a seres humanos (tóxicos, inflamables y de explosión)
- Técnicas de evaluación de probabilidades de ocurrencia
- Cuantificación de riesgo

Que es RAST?

Risk Analysis Screening Tool (R.A.S.T.)

RAST es una consolidación de herramientas de seguridad de proceso utilizadas para dar apoyo durante evaluaciones de identificación de peligros y análisis de riesgos (HIRA). Algo de la información que se obtiene es:

- Índice de fuego y Explosión de Dow (FEI)
- Índice de exposición a materiales químicos de Dow (CEI)
- Evaluación de peligros de reactividad
- Identificación de escenarios comunes
- Resumen de evaluaciones de Peligros y Consecuencias
- Tamizaje de efluentes por dispositivos de alivio
- Análisis de capas de protección (LOPA)

Como funciona?

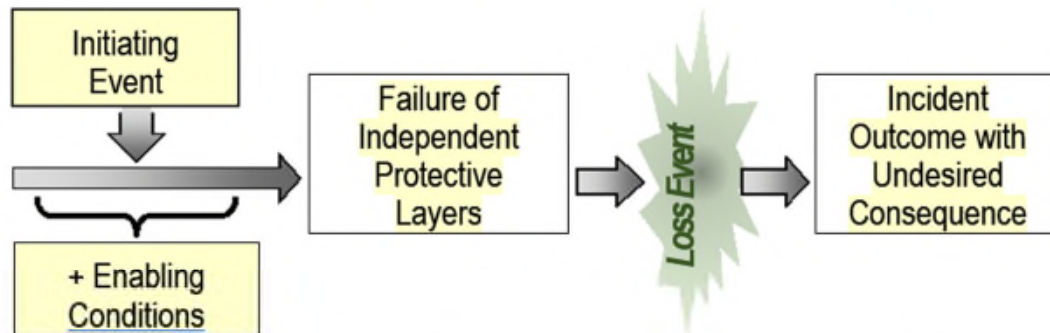


RAST se basa en completar las tareas de HIRA en un orden específico. El orden de ejecución de la tarea se basa en un flujo de trabajo de manera que los resultados de una estimación específica estén disponibles como entrada para la tarea posterior. RAST está configurado para usar información mínima para comenzar con la adición de más información a lo largo del tiempo para mejorar el análisis

El proceso de trabajo en que se basa incluye:

- Identificación del equipo o la actividad
- Identificación del material y peligros del proceso
- Desarrollo de escenarios
- Análisis de Consecuencias
- Frecuencia
- Análisis de riesgos

Desarrollo de escenarios



Scenario = Initiating Event + Loss Event +

Incident Outcome

Partial List of Initiating Events

- ☐ Human Error
- ☐ Mechanical Failure
- ☐ Regulator Failure
- ☐ Pump Seal Failure
- ☐ Heat Ex Tube Failure
- ☐ Hose Failure
- ☐ Loss of Agitation
- ☐ Utility Failure

Partial List of Loss Events

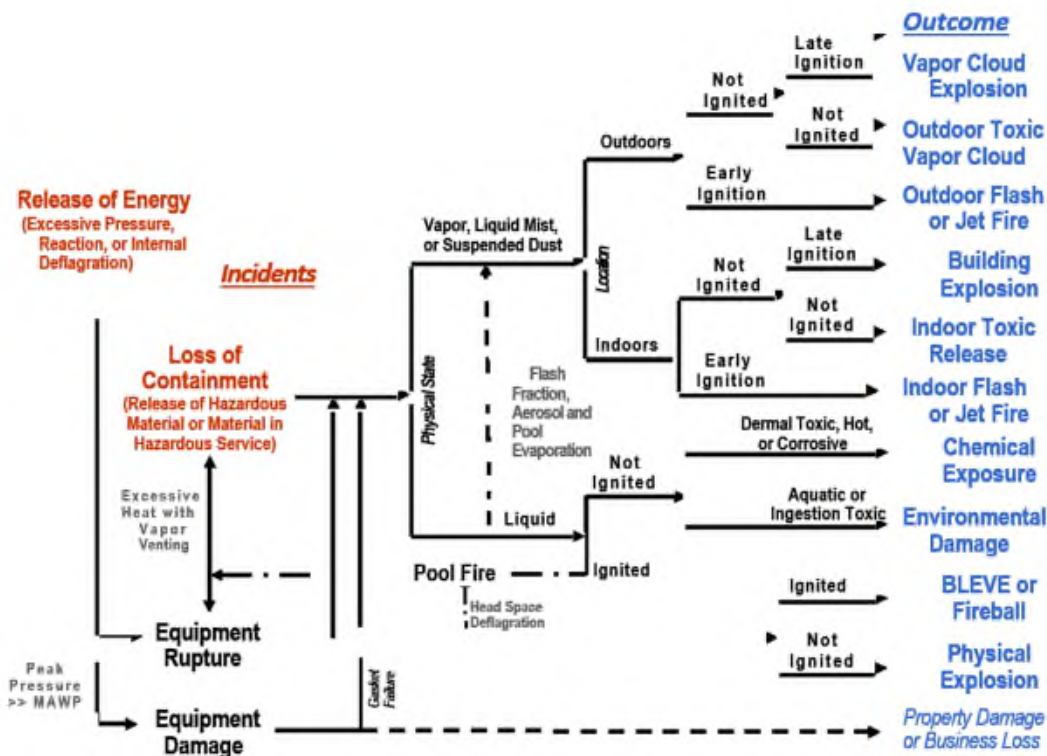
- ☐ Small Hole Leak
- ☐ Medium Hole Leak
- ☐ Full Bore Leak
- ☐ Overfill Release
- ☐ Vapor Release-Fire
- ☐ Vapor Release-Reaction
- ☐ Equipment Rupture
- ☐ Equipment Damage

Partial List of Incident Outcome

- ☐ Flash Fire
- ☐ Building Explosion
- ☐ Vapor Cloud Explosion
- ☐ Fireball or BLEVE
- ☐ Toxic Release
- ☐ Toxic Infiltration
- ☐ Environmental Damage
- ☐ Business Loss

Análisis de Consecuencias

RAST utiliza un arbol de fallas sencillo para determinar el resultado que resulte del evento de pérdida basandose en ubicación, cantidad, estado físico, concentracion y distancia al público, edificios ocupados o ubicacion del personal y criterios de congestión.



Risk Matrix: How to Interpret the Severity / Event Frequency									
Consequence Severity Description				Frequency					
Description	Harm/Item	Environment	Business Loss	10 ⁻⁴ /Year		10 ⁻³ /Year		10 ⁻⁴ /Year	
Severity Level 1	Minor Injury On-site (or < 0.01 Person Severely Impacted Off-site) Potential for Adverse Local Publicity	Reportable Incident to Environmental Agency OR < 10 kg Very Toxic to Waterway OR < 100 kg NPPA-H4 to Soil < 100 kg Toxic to Waterway OR < 1000 kg NPPA-H3 to Soil < 1000 kg Harmful to Waterway OR < 10000 kg NPPA-H2 to Soil	Property Damage and Business Loss < \$25M						
Severity Level 2	Major Injury On-site (eg 0.01 to 0.1 Person Severely Impacted Off-site) Public Required to Shelter In-place (eg Minor Injury Off-site)	Environmental Contamination Confined to Site OR < 100 kg Very Toxic to Waterway OR < 1000 kg NPPA-H4 to Soil < 1000 kg Toxic to Waterway OR < 10000 kg NPPA-H3 to Soil < 10000 kg Harmful to Waterway OR < 100000 kg NPPA-H2 to Soil	Property Damage and Business Loss \$25M to \$50M						
Severity Level 3	Potential Fatality On-site (eg 0.1 to 1 Person Severely Impacted Off-site) or Potential Major Injury Off-site	Environmental Contamination of Local Groundwater OR < 1000 kg Very Toxic to Waterway OR < 10000 kg NPPA-H4 to Soil < 10000 kg Toxic to Waterway OR < 100000 kg NPPA-H3 to Soil < 100000 kg Harmful to Waterway OR < 1000000 kg NPPA-H2 to Soil	Property Damage and Business Loss \$50M to \$500M						
Severity Level 4	1 to 10 People Severely Impacted On-site < 0.1 to 1 People Severely Impacted Off-site	Incidents Requiring Significant Off-Site Remediation OR < 10000 kg Very Toxic to Waterway OR < 100000 kg NPPA-H4 to Soil < 100000 kg Toxic to Waterway OR < 1000000 kg NPPA-H3 to Soil < 100000 kg Harmful to Waterway OR > 100000 kg NPPA-H2 to Soil	Property Damage and Business Loss \$500M to \$500M						
Severity Level 5	> 10 People Severely Impacted On-site > 1 Person Severely Impacted Off-site	Incidents with Significant National Media Attention OR < 100000 kg Very Toxic to Waterway OR < 1000000 kg NPPA-H4 to Soil > 100000 kg Toxic to Waterway OR > 1000000 kg NPPA-H3 to Soil	Property Damage and Business Loss > \$500M						

Unacceptable

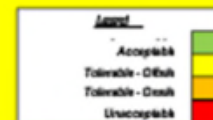
Tolerable - Offsite

Tolerable - Onsite

Acceptable

Low Frequency

High Frequency



Ejemplo

Equipment Parameters

Tank Volume = 100 m³ (26000 gal)

Chemical = Acrylonitrile

Maximum Allowable Working Pressure = 0.2 bar (2.9 psig)

Flat Bottom Non-Anchored Tank

Bottom Outlet Nozzle = 100 mm (4 inch)

Circulating Pump = 5.6 kW (7.5

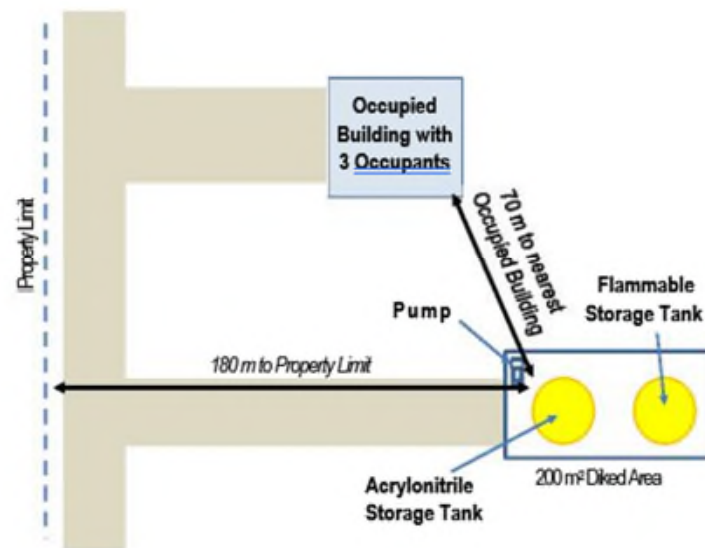
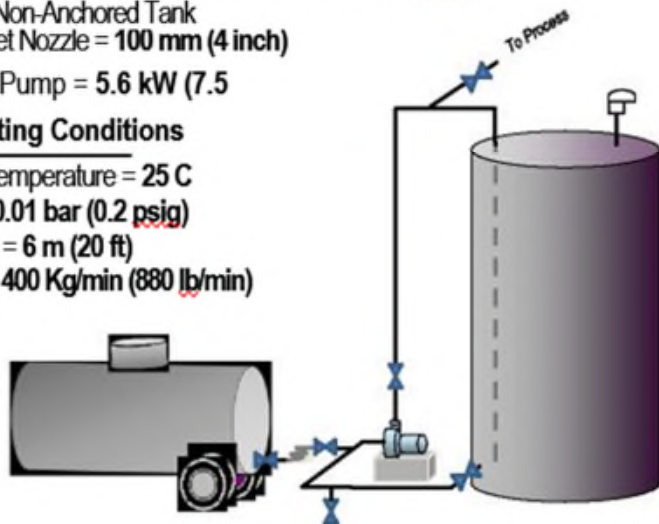
HP) Operating Conditions

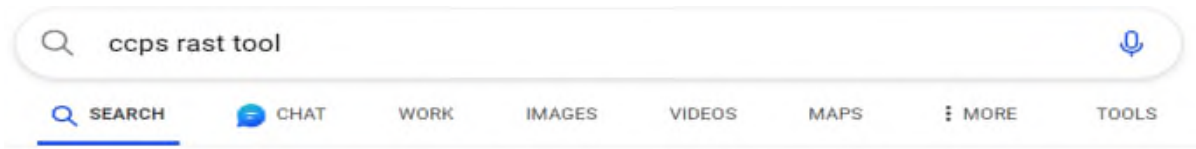
Operating Temperature = 25 C

Pressure = 0.01 bar (0.2 psig)

Liquid Head = 6 m (20 ft)

Feed Rate = 400 Kg/min (880 lb/min)





About 82.300 results

Recent chat topics



ccps rast tool



AIChE

[https://www.aiche.org/ccps/resources/tools/risk-analysis-screening...](https://www.aiche.org/ccps/resources/tools/risk-analysis-screening-...)

Risk Analysis Screening Tool (RAST) and Chemical Hazard ...

Web Sep 26, 2023 - The Risk Analysis Screening **Tool (RAST)** software and the Chemical Hazard Engineering Fundamentals (**CHEF**) documentation are made available through the ...

Rast Manual and Chef Aid

The Following Manuals are Available for RAST Users: RAST U...

Rast Development History

Historical Information about the RAST/CHEF Software and As...

FAQs

A: RAST is a proprietary tool and not available to the public.

<https://www.aiche.org/ccps/resources/tools/risk-analysis-screening-tool-rast-and-chemical-hazard-engineering-fundamentals-chef>

Risk Analysis Screening Tool (RAST) and Chemical Hazard Engineering Fundamentals (CHEF)

Last updated September 26, 2023



The Risk Analysis Screening Tool (RAST) software and the Chemical Hazard Engineering Fundamentals (CHEF) documentation are made available through the collaborative efforts of the Center for Chemical Process Safety (CCPS) and the European Process Safety Centre (EPSC) using the foundational tools generously donated for global use by The Dow Chemical Company.

The RAST software and its associated CHEF documentation were developed through the collaborative efforts of experts from member companies of the

Table of Contents

[RAST Overview](#)

[CHEF Overview](#)

[Case Studies](#)

[Terms and Conditions](#)

[Download and Install](#)

[RAST Manual and CHEF Aid](#)

[Frequently Asked Questions \(FAQs\)](#)

Preguntas?

Muchas Gracias!