



# SAFER THAN YESTERDAY

---

CSCChE PSM Series Presentation May 26,  
2026

**Using AI to Unlock PHA Data Potential and  
Uncover Hidden Hazards**

Presenter: David Asekomhe P.Eng

The background of the slide is a composite image. On the left, there is a photograph of an industrial facility, possibly a refinery or chemical plant, with large storage tanks and complex piping. The sky is bright and hazy. On the right, there is a blue-tinted overlay of a data center or server room, with rows of server racks and a grid of alphanumeric characters (hexadecimal-like) floating in the air. The overall color palette is dominated by blues, greys, and oranges.

# RSKLESS ANALYTICS

---

**Risk Intelligence | Your Data On Your Terms**

# INDUSTRY CHALLENGE #1

## WE NEED TO KEEP PEOPLE SAFE



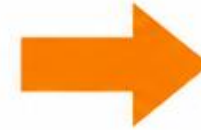
### INCIDENTS CONTINUE

Accidents continue to happen



### SLOW LEARNING

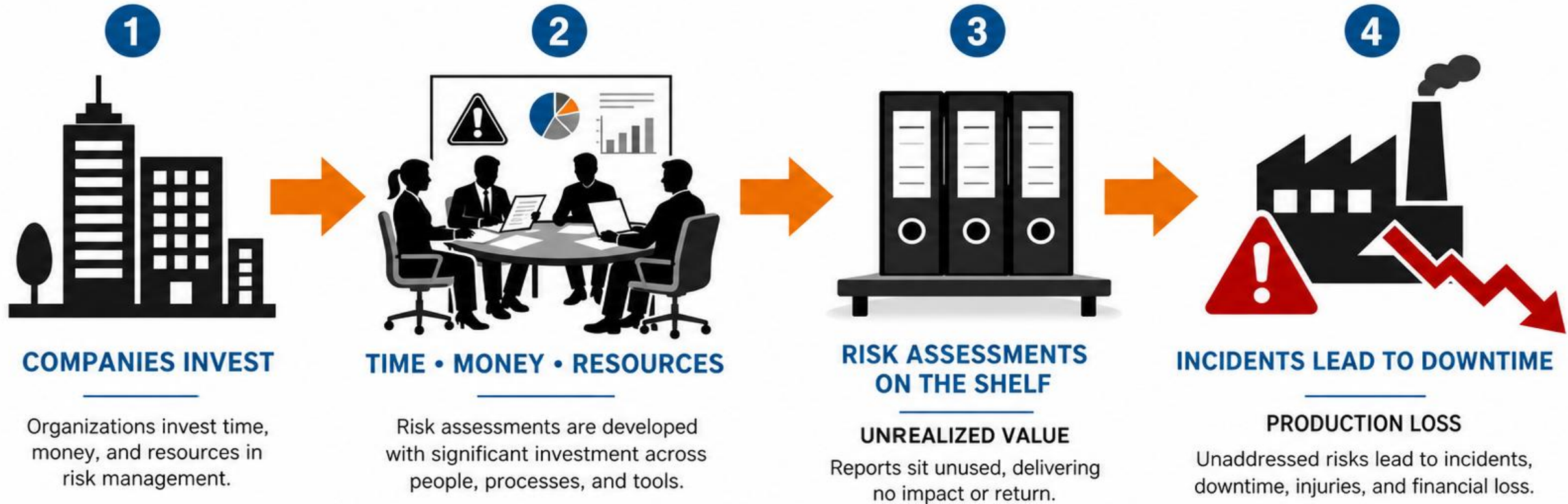
Learning from incidents is slow



### DECISIONS WITH LIMITED INFORMATION

Decision-making is not fully informed

# THE HIDDEN COSTS OF RISK ASSESSMENTS NOT IMPLEMENTED



**DON'T LET VALUABLE RISK ASSESSMENTS GATHER DUST.  
TURN INSIGHT INTO ACTION. PROTECT PEOPLE, ASSETS, AND PERFORMANCE.**

# INDUSTRY INCIDENTS #1

## PHA Related Incidents

### Williams Olefins Plant Explosion (Geismar, LA - 2013)

**The Failure:** Ignored PHA recommendations and improper Management of Change (MOC).

•**What Happened:** A catastrophic BLEVE (Boiling Liquid Expanding Vapour Explosion) occurred in a reboiler, killing two workers and injuring 167. The explosion was caused by the thermal expansion of a liquid propane mixture when the offline reboiler was inadvertently heated while isolated from its pressure relief device.

•**The PHA/HAZOP Gap:** The CSB found that in the 12 years leading up to the incident, the facility had a notoriously weak process safety culture. Crucially, leadership had failed to implement a key hazard analysis recommendation specifically intended to protect that exact reboiler from overpressure. Furthermore, when block valves were installed that isolated the reboiler from its relief valve, the MOC and PHA reviews completely failed to identify the new hazards introduced by the change

### •Tesoro Anacortes Refinery (Anacortes, WA - 2010)

**The Failure:** Improper PHA relying on unverified, judgment-based safeguards.

•**What Happened:** A nearly 40-year-old heat exchanger catastrophically ruptured due to High Temperature Hydrogen Attack (HTHA) during a hazardous, non-routine startup operation. Seven workers were killed.

•**The PHA/HAZOP Gap:** The required PHAs repeatedly failed to ensure that hazards were controlled during transient operations like startups. The CSB noted that the PHAs cited only *judgment-based safeguards* and never actually verified if the listed safeguards were effective in practice. There was no requirement for technical experts to prove safety effectiveness with actual operating data; the culture required "proof of danger" rather than "proof of effective safety."

#### CSB Releases Final Case Study into 2013 Explosion and Fire at Williams Olefins Plant in Geismar, Louisiana

Post  
October 19, 2016, Baton Rouge, LA – Today the CSB released its final report into the June 13, 2013, explosion and fire at the Williams Olefins Plant in Geismar, Louisiana, which killed two employees. The report concludes that process safety management program deficiencies at the Williams Geismar facility during the 12 years leading to the incident allowed a type of heat



#### U.S. CHEMICAL SAFETY AND HAZARD INVESTIGATION BOARD INVESTIGATION REPORT CATASTROPHIC RUPTURE OF HEAT EXCHANGER (SEVEN FATALITIES)



TESORO ANACORTES REFINERY  
ANACORTES, WASHINGTON  
APRIL 2, 2010

# INDUSTRY INCIDENTS #2

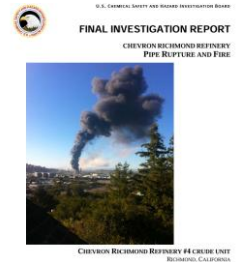
## PHA Related Incidents

### Chevron Richmond Refinery (Richmond, CA - 2012)

**The Failure:** Improper PHA lacking a formal damage mechanism methodology.

•**What Happened:** A catastrophic pipe failure in a crude unit caused the release of a massive flammable hydrocarbon vapour cloud. The vapour ignited, endangering 19 employees and sending 15,000 community members to the hospital.

•**The PHA/HAZOP Gap:** The pipe failure was caused by sulfidation corrosion, a well-known damage mechanism. However, the PHA conducted on that piping failed to identify corrosion as a potential cause of a rupture. Why? Because the facility did not require the use of a recognized methodology for determining safeguard effectiveness. They relied entirely on the personal knowledge and memory of the PHA team members. The CSB directly cited this as a major failure, leading to industry-wide pushes for formal Damage Mechanism Reviews (DMRs) to be explicitly integrated into the PHA cycle.

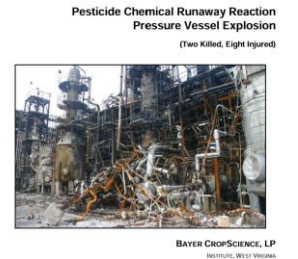


### Bayer CropScience (Institute, WV - 2008)

•**The Failure:** Incomplete PHA and failure to mandate Safety Instrumented Systems (SIS).

•**What Happened:** A runaway chemical reaction occurred inside a residue treater pressure vessel, causing it to explode, killing two workers.

•**The PHA/HAZOP Gap:** The CSB found the company failed to perform a thorough PHA. The existing PHA team had actually recognised that the control system was antiquated and lacked a proper Safety Instrumented System (SIS) for a highly hazardous process. However, instead of mandating an engineered safeguard, they evaluated the risk of high chemical concentrations as a mere "product quality problem" to be handled by operator intervention. The lack of automated interlocks directly allowed the runaway reaction to occur.



# YOUR DATA, ON YOUR TERMS



Custom Branded Web App



Pre-Programmed Analytics



Filter, Sort, and Export



Customizable Widgets



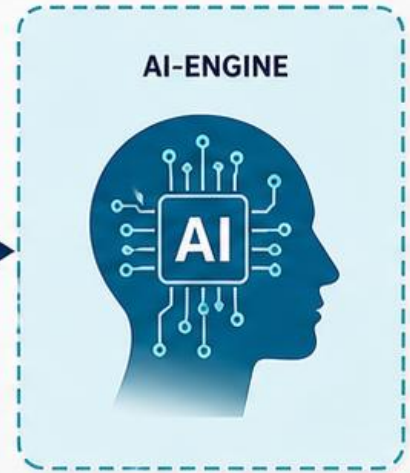
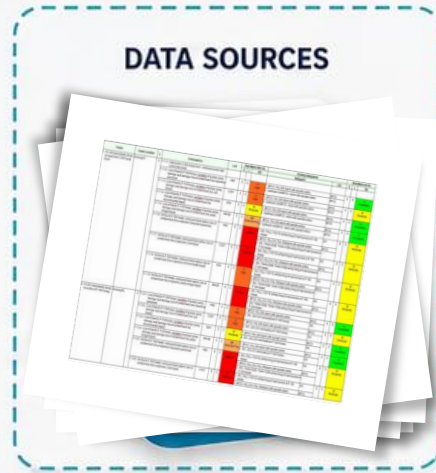
Risk Visualization



AI Insights



Open API Configuration



Processing



# YOUR DATA, OPERATIONALIZED



- Guided by Decades of PSM, Operations, and Technology Experience



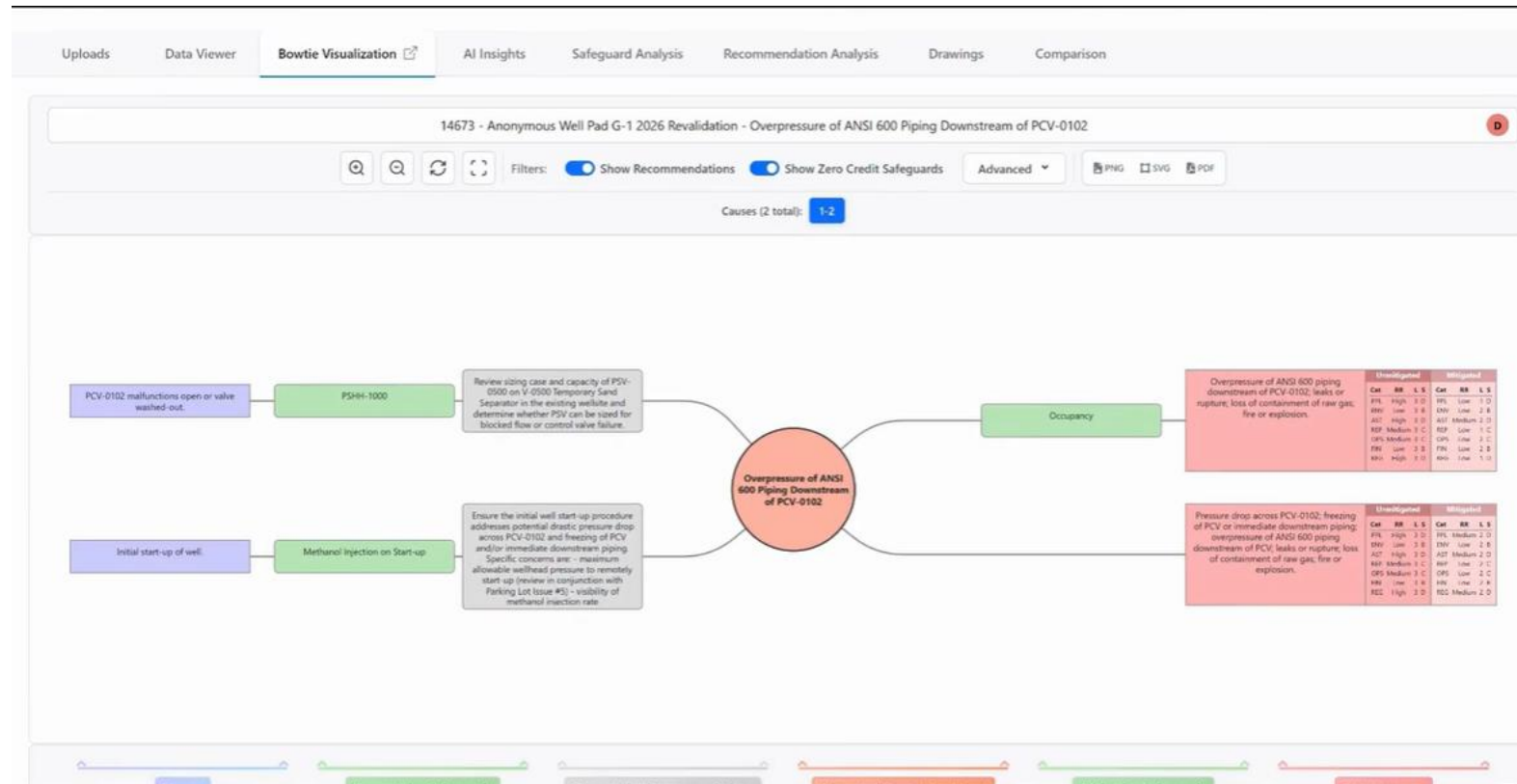
- Aligned to industry best practices and standards API 750, OSHA 1910, CSA Z767, CCPS Risk-Based PSM



- Trained on Hundreds of PHA Data sets from Oil and Gas, Chemical, Petrochemical, etc, from Canada, USA, Pakistan, GCC Region



# UPLOAD & ANALYZE AI BOWTIES



Click the Image to View the Video

# AI INSIGHTS

The screenshot displays the RskLess AI Insights dashboard. At the top, there are three main visualizations: a donut chart on the left, a map of Western Canada in the center with red location pins for Vancouver, Calgary, and Edmonton, and a semi-circular gauge chart on the right. The gauge chart shows two categories: 'Unmitigated High Risk (81)' in orange and 'Mitigated High Risk (1768)' in blue. Below these is a navigation bar with tabs for 'Uploads', 'Data Viewer', 'Bowtie Visualization', 'AI Insights' (which is active), 'Safeguard Analysis', 'Recommendation Analysis', 'Drawings', and 'Comparison'. The main content area is split into a 'Chat History' sidebar on the left and a central chat window. The chat window shows a conversation with 'RskLess AI Insights' where the AI assistant has provided a detailed technical assessment for 'PSL-101A/B: Equipment Identity & Configuration'. The assessment includes details such as the tag 'PSL-101A/B (Pressure Switch Low, dual units for reactors A and B)', setpoint 'Low-Low trip at 330 kPaG', and function 'Actuates interlock I-1 to trigger reactor shutdown'. It also provides process context and lists risk scenarios protected by the safeguard. A text input field at the bottom of the chat window contains the prompt 'Ask me about your HAZOP data...'. A black text box is overlaid at the bottom of the screenshot, containing the text 'Now let's deep dive into one particular safeguard. What can the AI insights'.

Now let's deep dive into one particular safeguard. What can the AI insights

Click the Image to View the Video



**DON'T BE RECKLESS!  
PARTNER WITH RSKLESS.**

**Visit Us**

**[www.rskless.com/pha-analytics](http://www.rskless.com/pha-analytics)**

**Or Contact Us Now  
[Jonathan@rskless.com](mailto:Jonathan@rskless.com)**