



SPRING26 +22ND GCPS

A Joint AIChE and CCPS Meeting

April 12 – 16, 2026
Houston, TX

**Where Chemical
Engineering
Meets Innovation**

Have Facilitation Skills – Will Travel



Where Chemical Engineering
Meets Innovation



Author

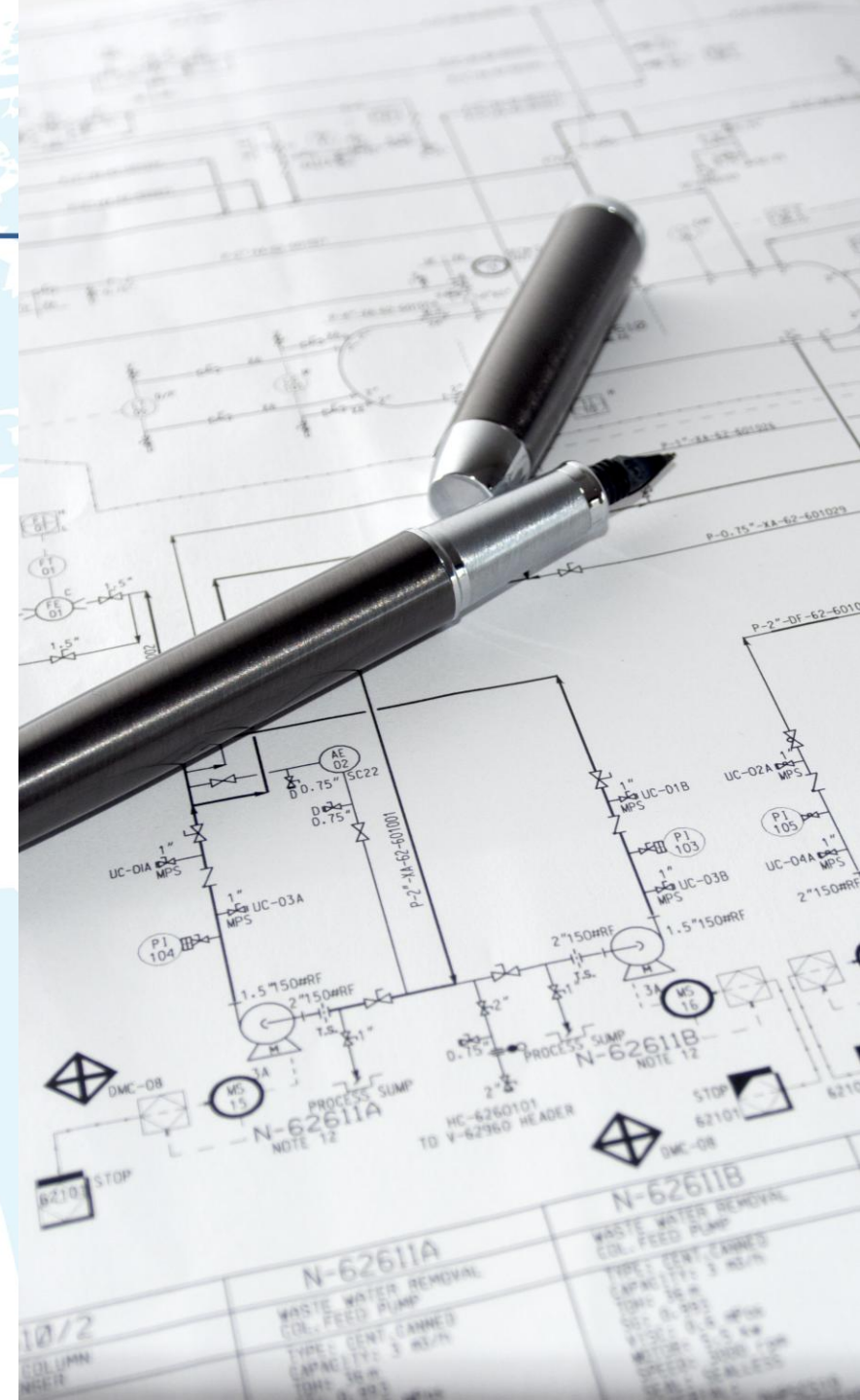
David M. Heller, CSP, CPSA

- ▶ Chemical Engineer, RPI
- ▶ Began career as production and plant engineer – Carbide, American Cyanamid
- ▶ In safety since 1984
- ▶ Corporate PSM Engineer
- ▶ Plant Safety Manager
- ▶ Lead Investigator at CSB – 1999-2005
- ▶ AcuTech Consulting since 2005



Agenda

- Facilitator's Skillset
- Lessons from the CSB
- Common CSB Themes
- Managing the Menagerie





Technical Ability



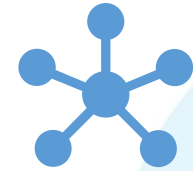
Understand the process deeply enough to ask incisive questions



Be fluent in multiple PHA methods



Recognize weak or non-independent safeguard



Connect findings to PSM elements



Analytical Discipline



Focus the team on
credible scenarios



Break down
complex scenarios



Identify patterns



Maintain
consistency



Group Dynamics

- Create a safe space
- Manage conflicts
- Balance the table
- Keep the momentum going
- Fight the inclination to engineer a solution
- Recap and reconsider





Rigorous Documentation



Capture scenarios precisely



Ensure recommendations are
specific, measurable, &
traceable



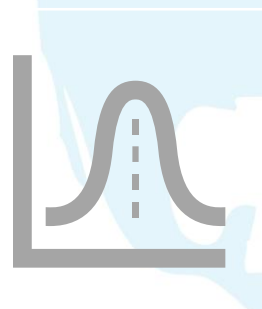
Maintain a clean worksheet



Ethical Leadership



Resist Pressure



Challenge normalization of
deviation



Frame the PHA as a
learning exercise



Lessons from the CSB

BP Texas City Refinery Explosion (2005)

PHAs did not identify credible overfill and blowdown scenarios, in part because the team accepted longstanding operating practices without challenge. The report notes that hazard reviews were “incomplete” and “failed to identify major accident scenarios.”

Chevron Richmond Refinery Fire (2012)

PHA process did not adequately analyze corrosion hazards or challenge assumptions about piping integrity. Investigation highlighted a culture where PHA teams did not rigorously question degradation mechanisms or worst-case consequences.

PES Philadelphia Refinery Explosion (2019)

Consequences of HF release scenarios were underestimated and safeguards were credited that were not active



Lessons from the CSB

Husky Superior Refinery Explosion (2018)

PHA did not fully evaluate the consequences of a fluid-catalytic-cracking unit (FCCU) slide-valve failure. The team accepted assumptions about valve reliability without deeper challenge.

Tesoro Anacortes (2010)

PHAs did not adequately consider high-temperature hydrogen attack (HTHA) risks. The facilitation did not push the team to question long-standing assumptions or examine degradation mechanisms.

DuPont La Porte (2014)

Catastrophic release scenarios involving methyl mercaptan were missed. The team did not explore credible deviations or human-factors vulnerabilities.



Common CSB Themes

- Failure to challenge assumptions
- Over-crediting safeguards
- Inadequate exploration of worst-case scenarios
- Poor integration of operating experience
- Insufficient participation or engagement
- Documentation that obscured causal chains



Q&A

Thank you for your time and interest.

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