



Normalization

O_f

Deviation

Process Safety Congress
Dordrecht
May 30, 2018

James Conner
Eiger Consulting, LLC
Houston, Frankfurt, Amsterdam



- Why would they do that?

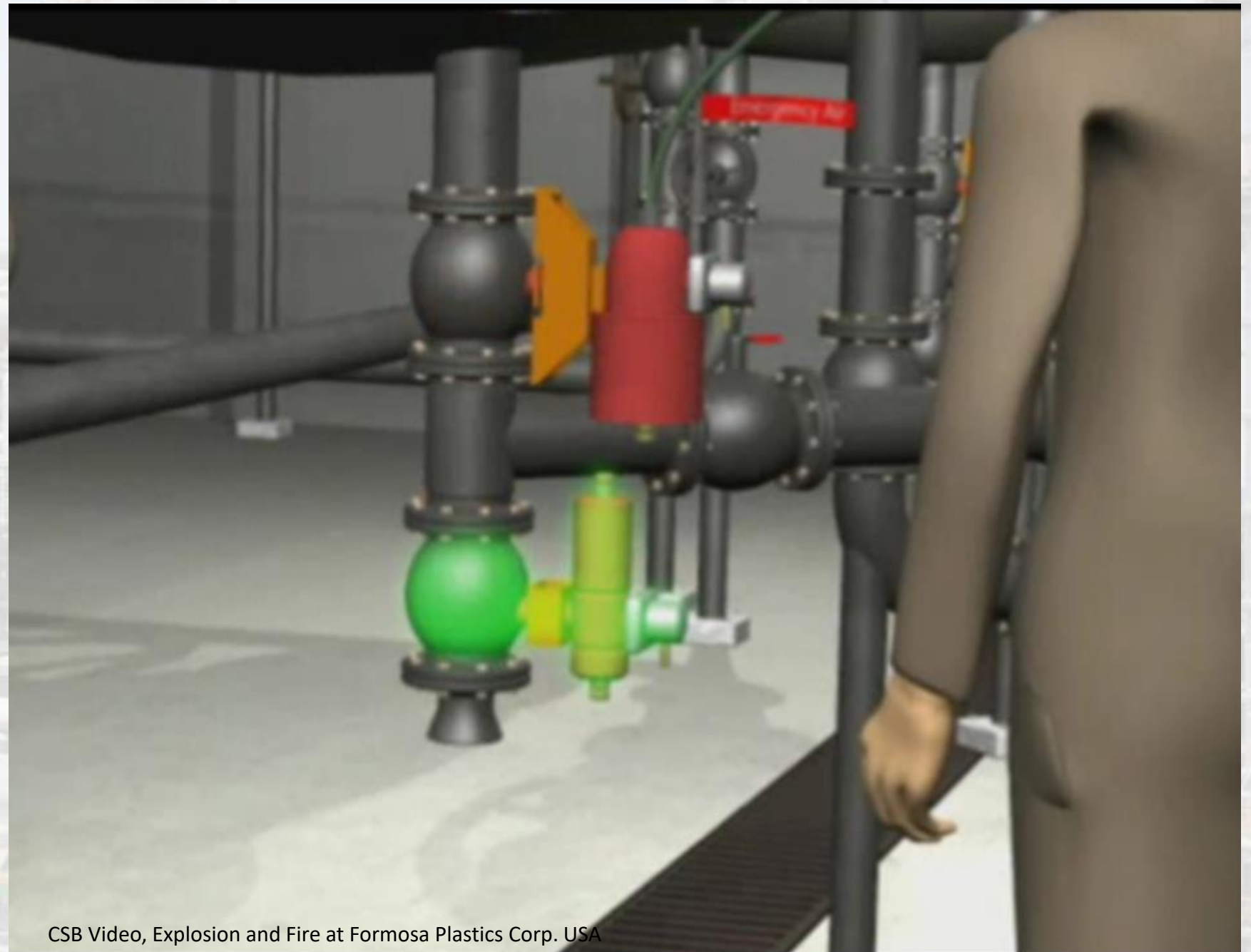
- What were they thinking?

That would never happen to us.

Formosa Plastics, 2004



Interlock on Upper Valve Bypassed While Reactor In Operation



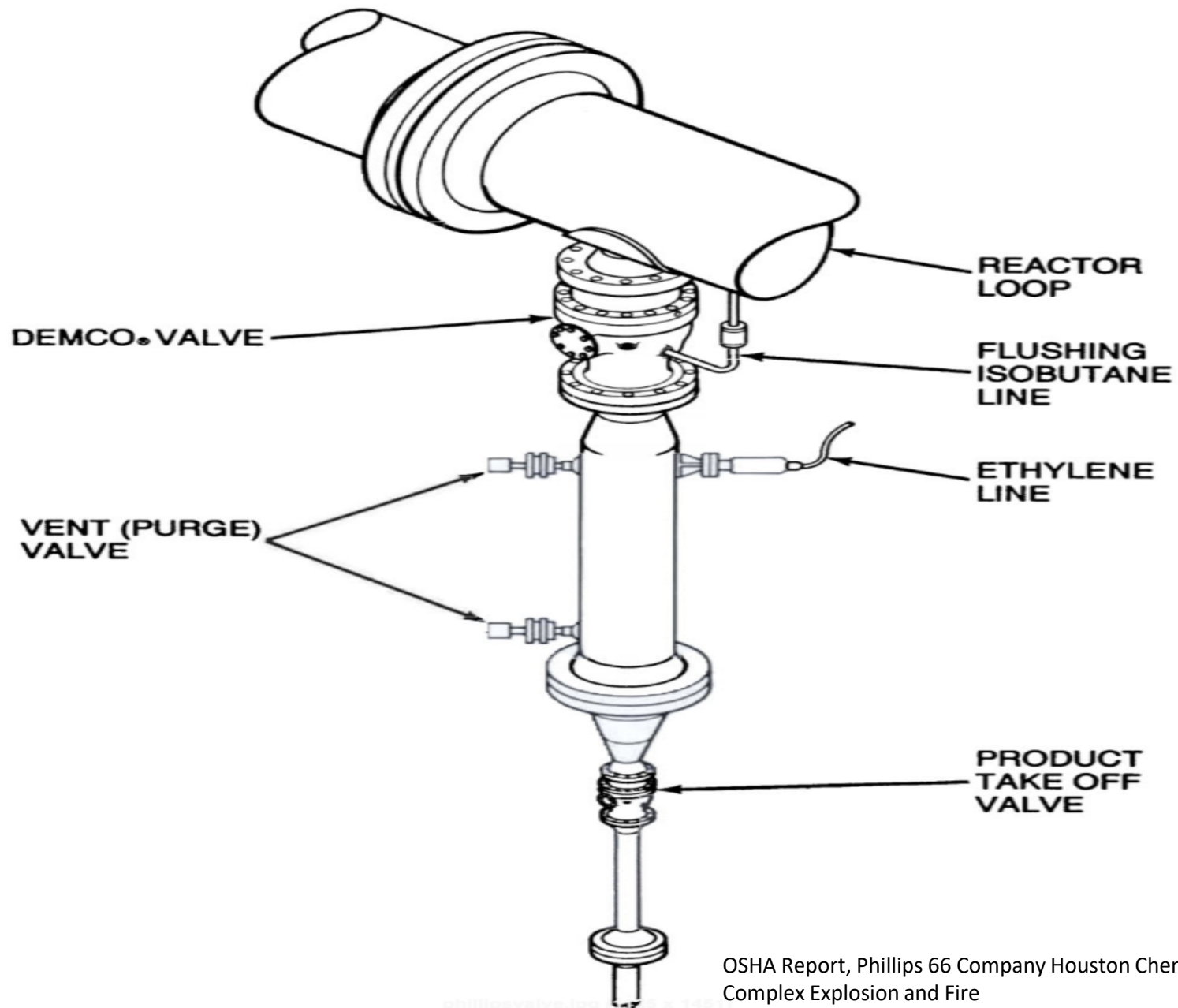
CSB Video, Explosion and Fire at Formosa Plastics Corp. USA

Phillips 66, 1989



OSHA Report, Phillips 66 Company Houston Chemical Complex Explosion and Fire

Valve Opened to Atmosphere During Maintenance While Unit in Operation



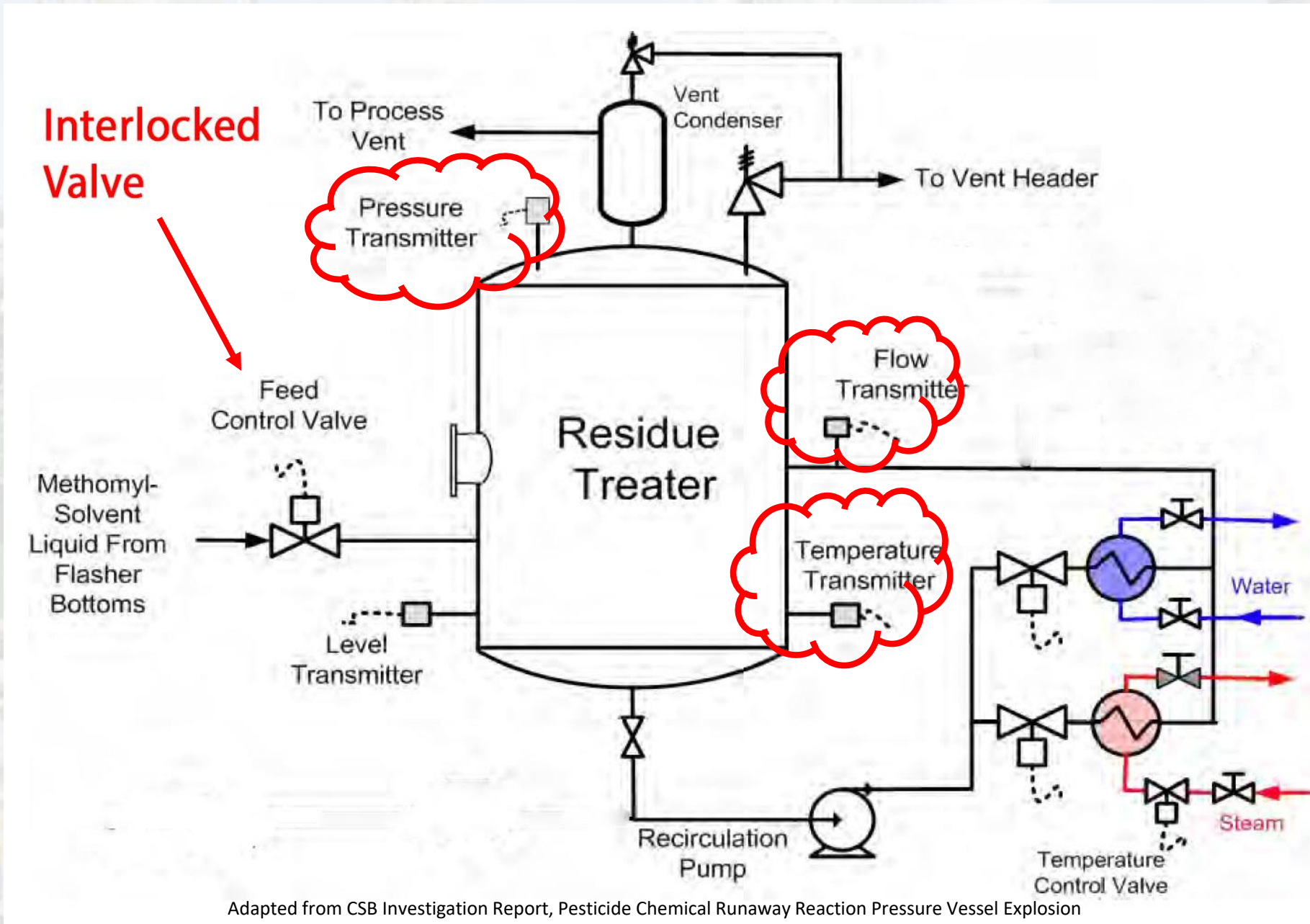
OSHA Report, Phillips 66 Company Houston Chemical Complex Explosion and Fire

Bayer CropScience, 2008



CSB Investigation Report, Pesticide Chemical Runaway Reaction Pressure Vessel

Interlocks on Feed Valve Bypassed for Startup



Adapted from CSB Investigation Report, Pesticide Chemical Runaway Reaction Pressure Vessel Explosion

How Minimize NOD?

- Designs that work
 - In all credible scenarios. In all phases of operation, maintenance, and calibration.
 - Efficacy of safety barriers immune to fouling, corrosion, wear, etc.
- Disciplined “trapping” and risk review of needed deviations from Standard Operating/Maintenance Procedures



Thank you.

Contact Information

Jim.Conner8@att.net

+1 832 651 8539