

14th Chemical Process Safety Sharing (CPSS)

Safety Moment

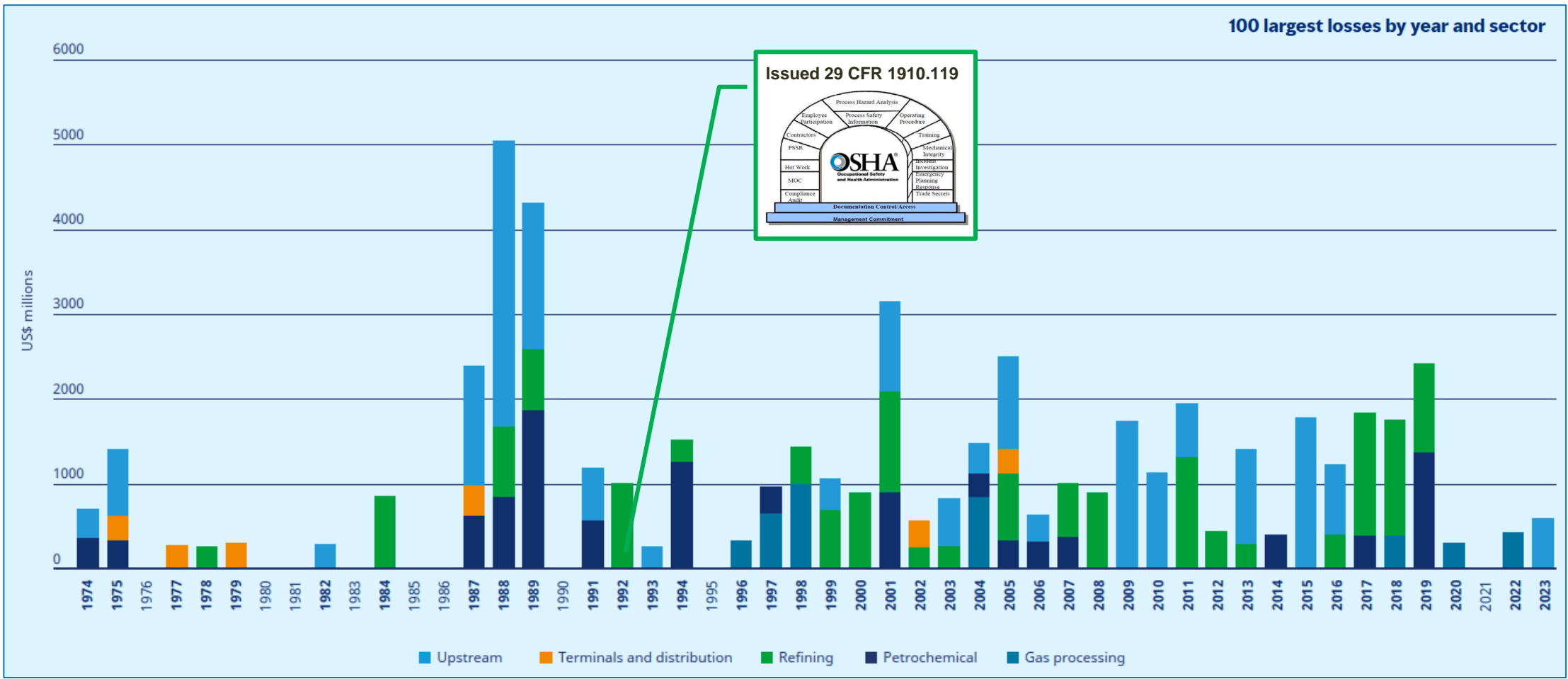
Plant Incidents – What're Root Causes in PSM elements

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The Challenge of PSM measure against Plants' losses from Incidents



Source: 28th Marsh Specialty's 100 Largest Losses in the Hydrocarbon Industry report between 1974 and 2023



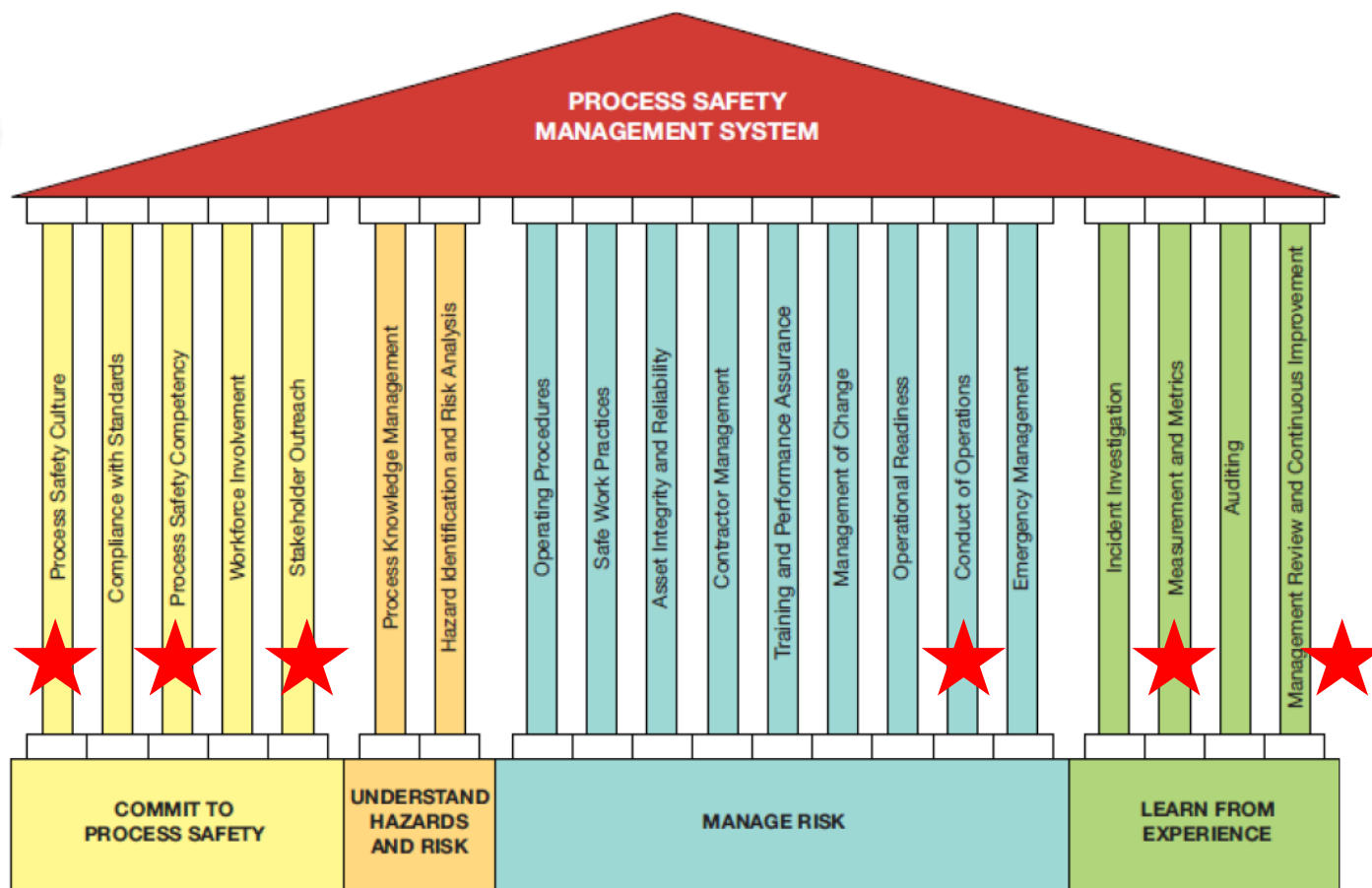
14th Chemical Process Safety Sharing (CPSS)
Sep 27th, 2024, BITECH, Thailand



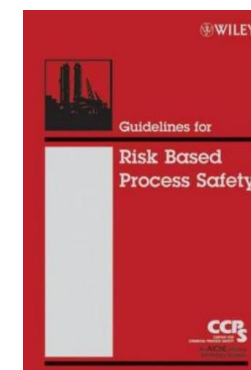
What're Root Causes and Which PSM elements contribute major failure?



Analyze via CCPS Risk-based Process Safety (RBPS) - 20 PSM elements



- Recommended guideline
- More important elements
- Open frame to improve further





Incidents Databases



US Chemical Safety Board



Insurance Company



UK Health & Safety Executive



US National Transport Safety Board



US Environmental Protection Agency



IChemE Safety and Loss Prevention
Special Interest Group



Center for Chemical Process Safety



European Process Safety Centre



Analysis, Research and
Information on Accidents

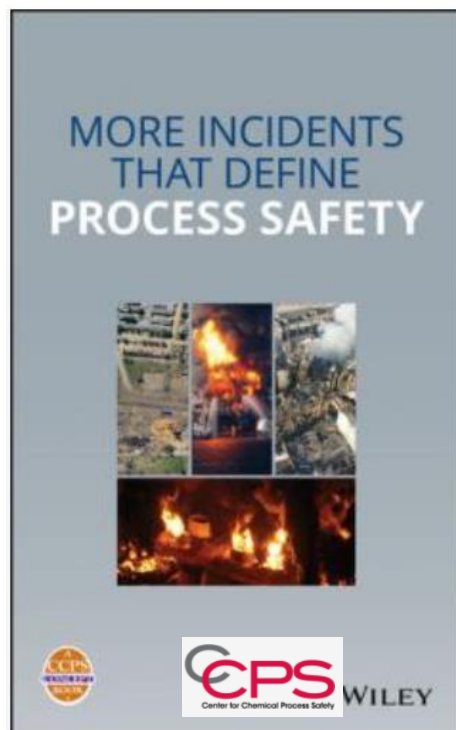


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Plant Incidents Statistic Data Review

Source: <https://processsafetyintegrity.com/>



1st 2019, Over 50 incidents on the chemical industry Including China, India, Italy and Japan





Journal of Loss Prevention in the Process
Industries

Volume 44, November 2016, Pages 171-192



A web-based collection and analysis of process safety incidents

Pranav Kannan, Tatiana Flechas, Edna Mendez, Laura Angarita, Purvali Chaudhari,
Yizhi Hong, M. Sam Mannan  

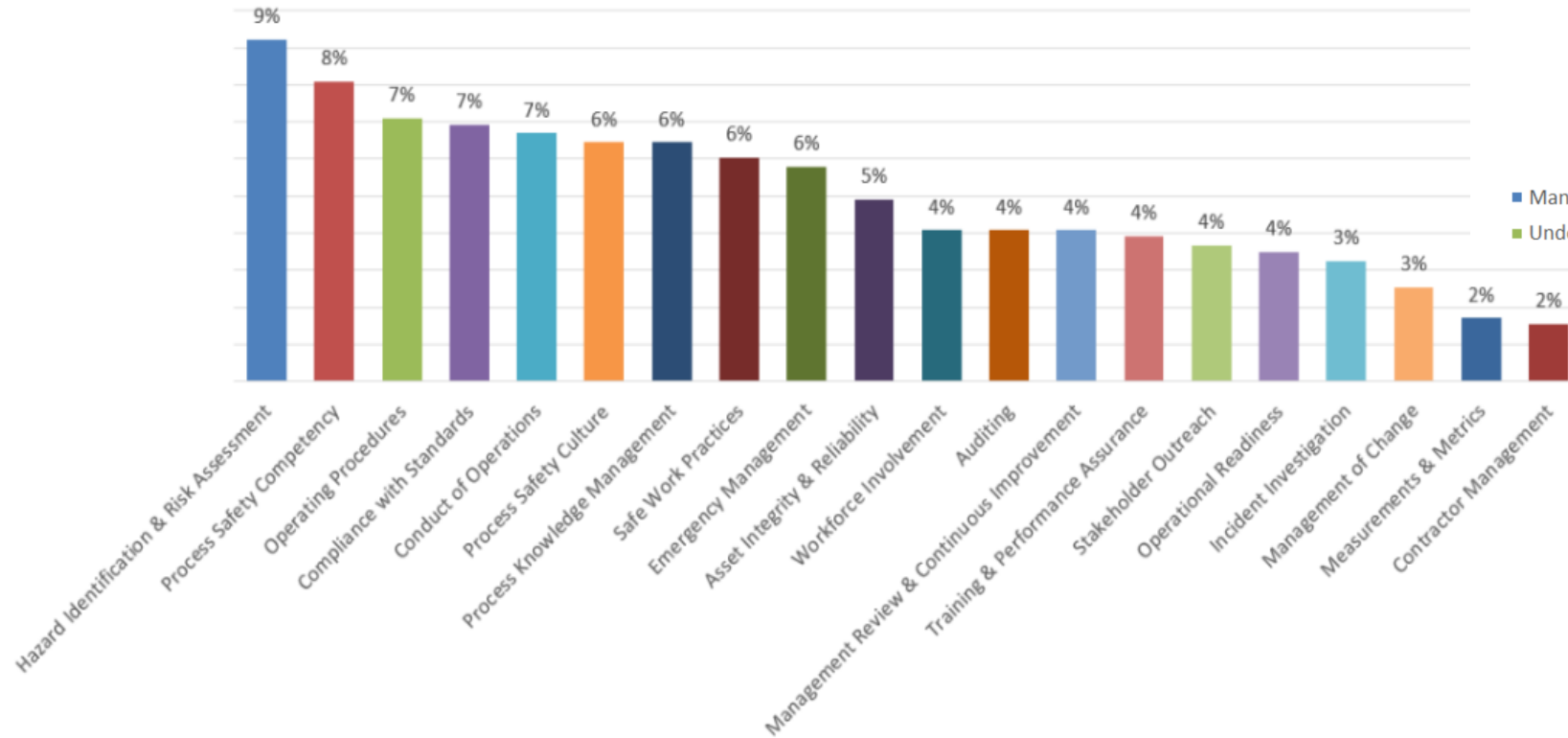


Plant Incidents Statistic Data Review

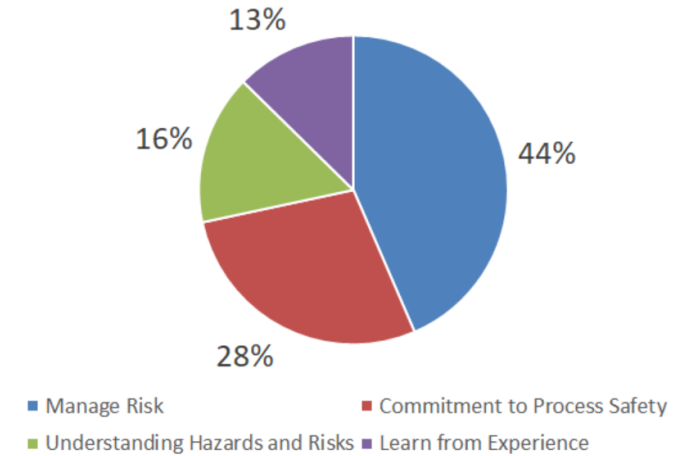
Source: <https://processsafetyintegrity.com/>



Proportion of Incidents mapped to CCPS RBPS Elements



Proportion of Incidents mapped to CCPS RBPS Pillars

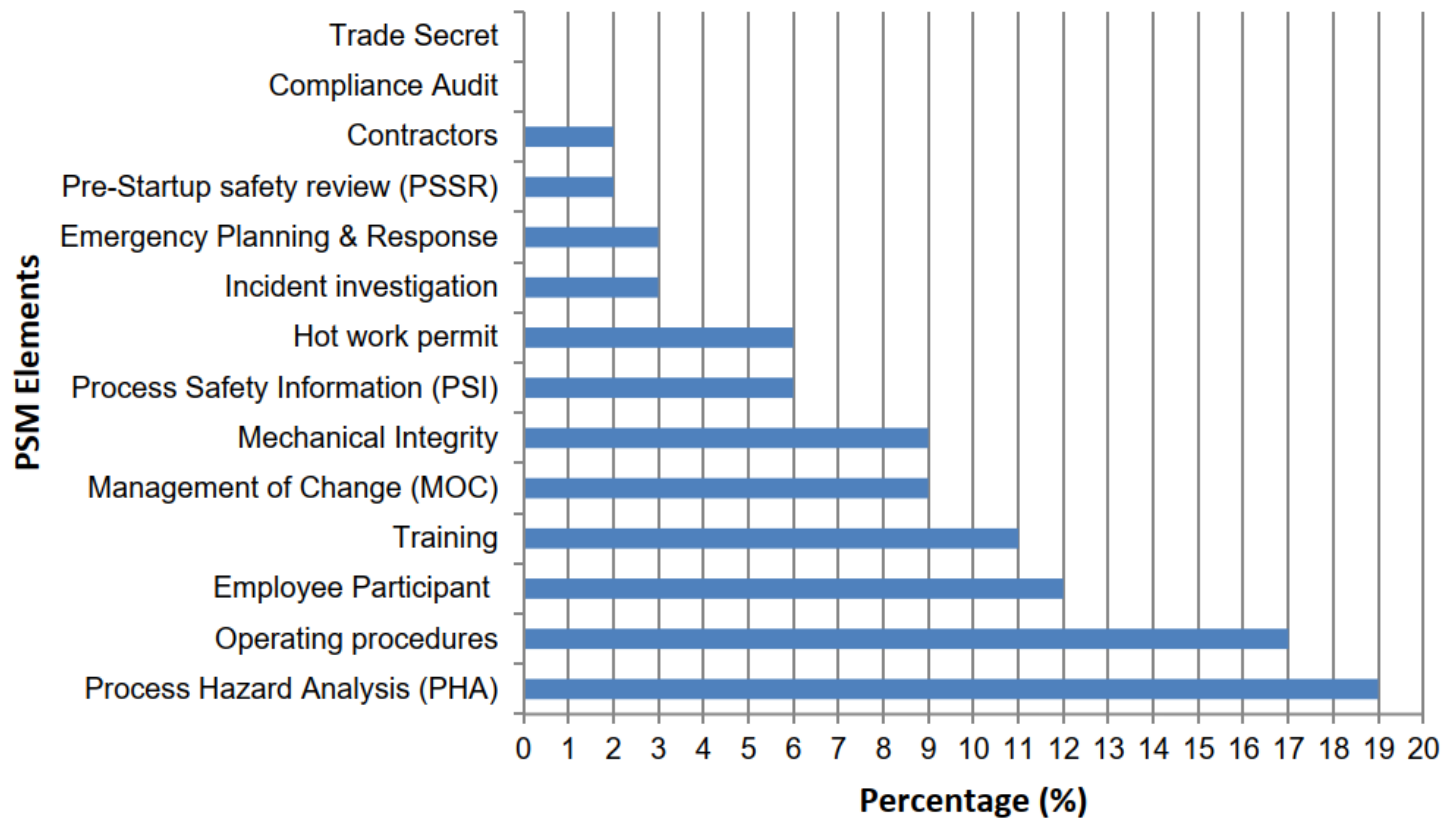




Plant Incidents Statistic Data Review (OSHA PSM 14 elements)



Source: Harris Tarmimi Abu Bakar, Piong Han Siong, Chin Koy Yan, Kamarizan Kidam, Mohamad Wijayanuddin Ali, Mimi H. Hassim, Hamidah Kamarden, Analysis of Main Accident Contributor according to Process Safety Management Elements Failure, CHEMICAL ENGINEERING TRANSACTIONS, Vol 56, 2017.



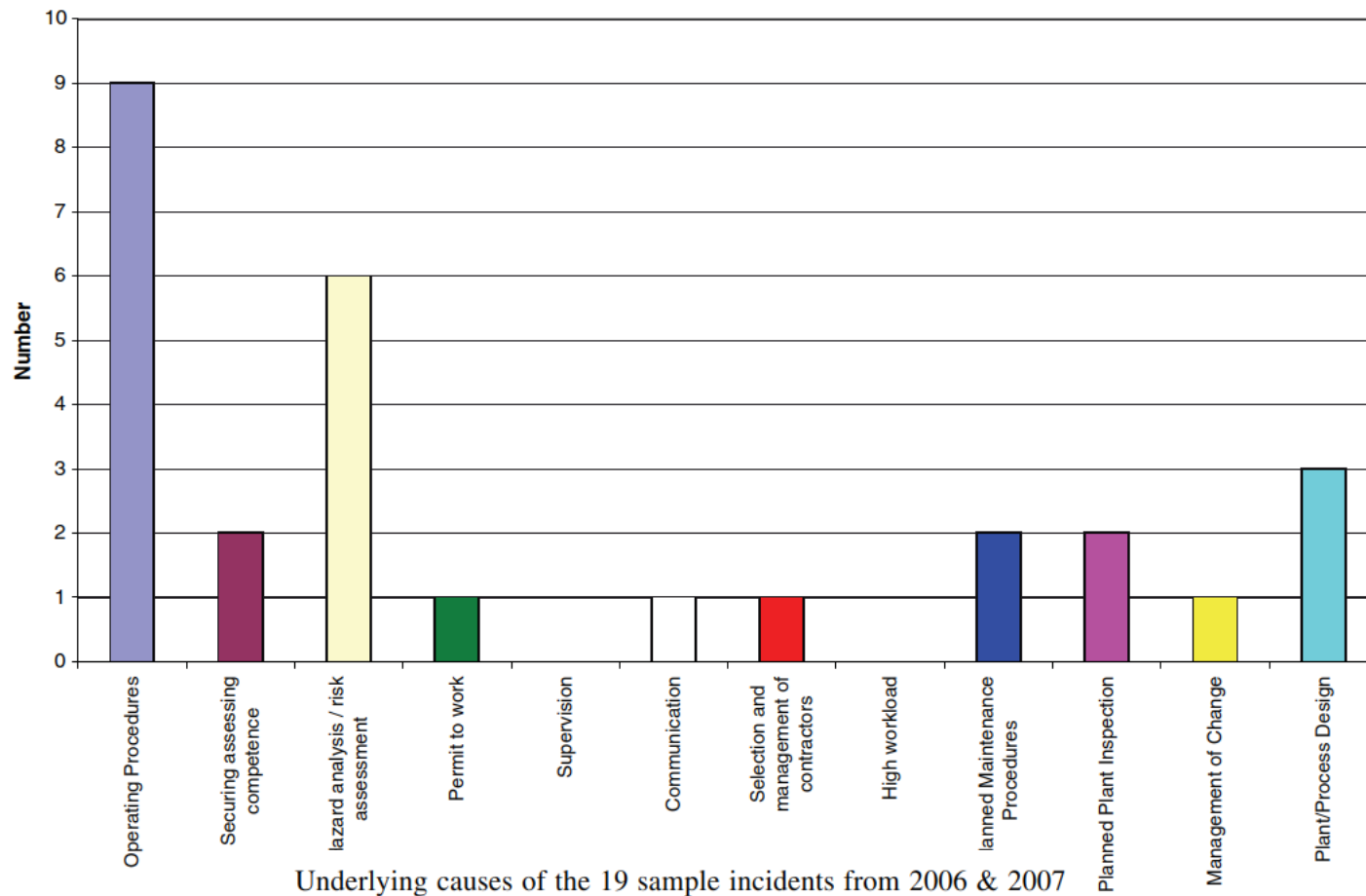
The contribution of PSM elements to accidents in the CPI



Plant Incidents Statistic Data Review (OSHA PSM 14 elements)



Source: LEARNING FROM PROCESS SAFETY INCIDENTS, John A Hare, Michael P Johnson, Brian Fullam. IChemE SYMPOSIUM SERIES NO. 155.



Poor Operation leading to Process Safety Incident

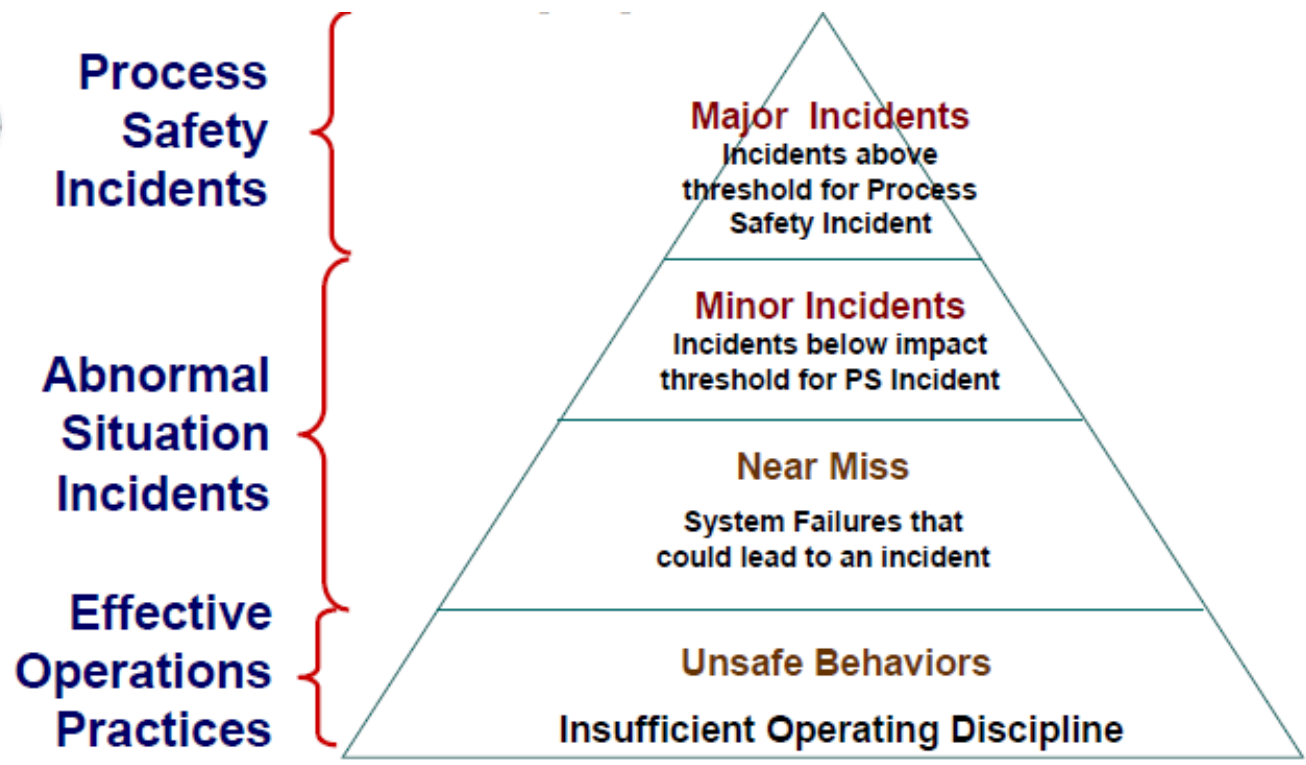


Illustration based on: CCPS *Process Safety Leading and Lagging Metrics*.

- How to ensure the operating procedures used are safe?
- How to prevent the operators violate the safe procedures?
- How to prevent the operators do some errors?
- How to keep sustainment for all PSM elements?



Thank you for your attention

