PROCESS SAFETY PRACTICES & CHEMICAL ACCIDENT PREVENTION

US EPA Region 9
AZ Environmental Strategic Alliance
November 10, 2020

CHEMICAL ACCIDENT PREVENTION & EMERGENCY PLANNING AND PREPAREDNESS

Risk Management Program (RMP)
Under the Clean Air Act

General Duty Clause (GDC)
Under the Clean Air Act

The Emergency Planning and Community Right to Know Act (EPCRA)

Process Safety Culture & Normalization of Deviance

WHY IS IT IMPORTANT?

Management systems and their associated policies and procedures depend upon the actions of individuals and groups for their successful implementation.

The American Institute of Chemical Engineers

Chlorine blowdown line with significant external corrosion and pitting.

NORMALIZATION OF DEVIANCE

"The gradual process through which unacceptable practice or standards become acceptable. As the deviant behavior is repeated without catastrophic results, it becomes the social norm for the organization."

In many cases, the issue becomes one of deviation from basics even though there is full understanding of what deviation from them could mean

What factors are at play?

"EVERYBODY DOES IT..."

"IT'S NOT A SERIOUS HAZARD..."

ARE YOU NORMALISING RISKS?

Stop Accepting Wrong Practices or Dangerous Conditions

"NOTHING HAS HAPPENED BEFORE..."

"THAT'S HOW IT'S DONE HERE..."

AI-PSM
TAMING THE TIGER

PROCESS SAFETY DAY
19 SEPTEMBER 2017

شركة تنمية نفط عمان
Petroleum Development Oman


Process Events:
Low frequency
High Consequence

NORMALIZATION OF DEVIANCE-

CHALLENGER SPACE SHUTTLE DISASTER

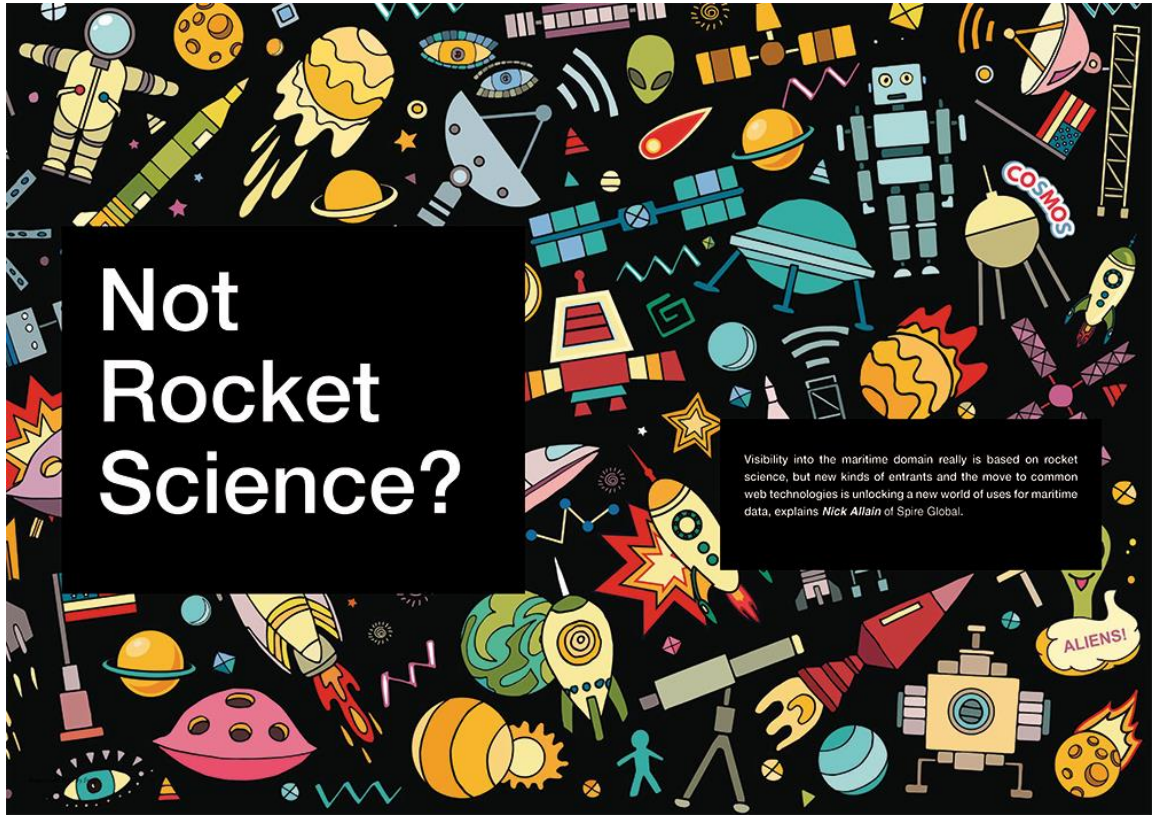
CHALLENGER SPACE SHUTTLE DISASTER- 1986

Challenger Space Shuttle Disaster, 1986

- Engineers continually observed defects in the rocket booster O-Rings, but they became treated as an “acceptable risk”, due largely to schedule pressure, after repeated successful launches
- Launch day was especially cold. Engineers initially issued an unprecedented “no-launch” recommendation, but were unable to persuade NASA to cancel the launch
- One component suffered a failure of both primary and backup O-rings – led to disintegration of the booster rocket and then the shuttle itself

MOST ROOT CAUSES DON'T INVOLVE ROCKET SCIENCE

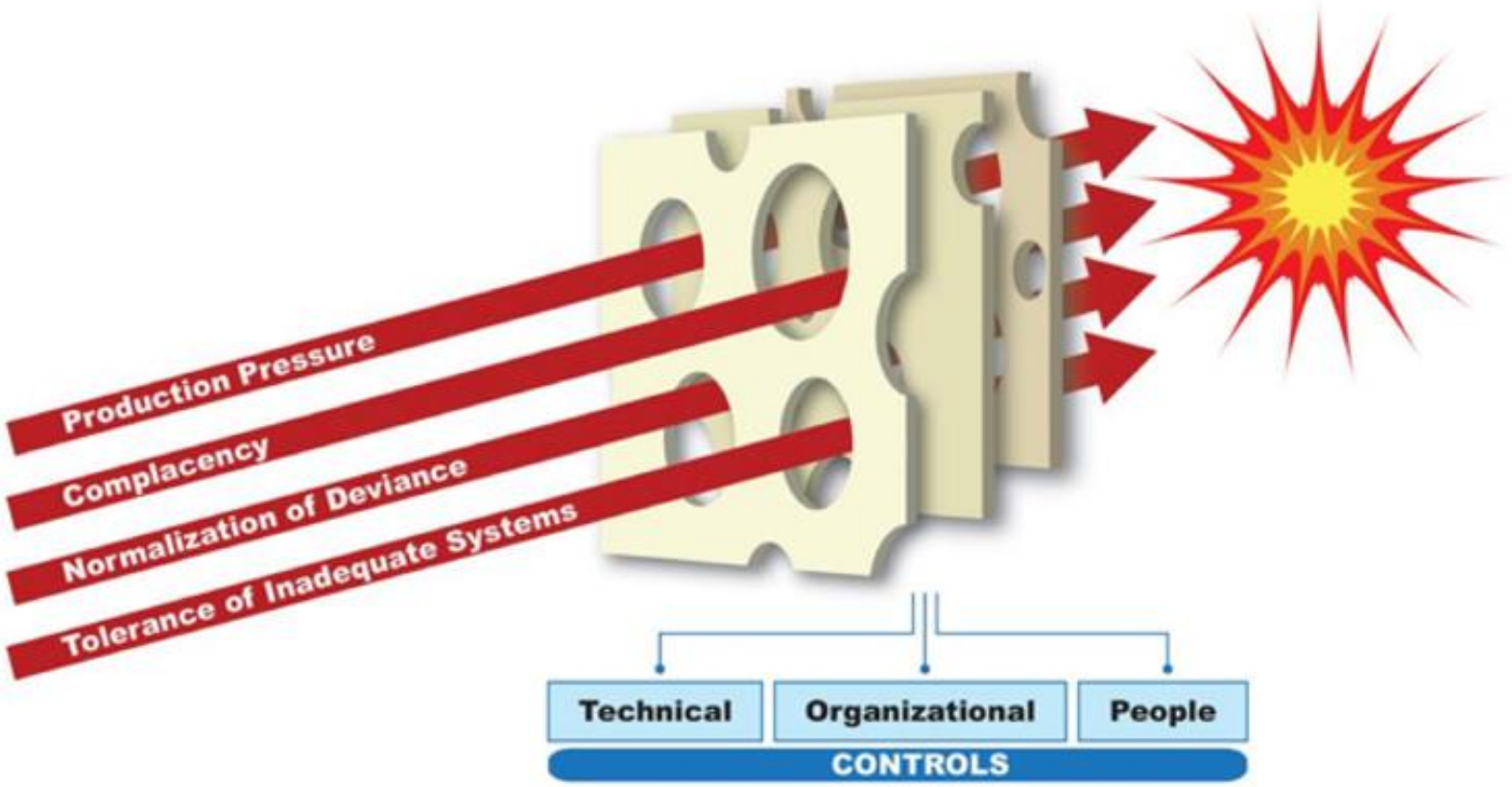
Many root causes were repetitive and have been observed



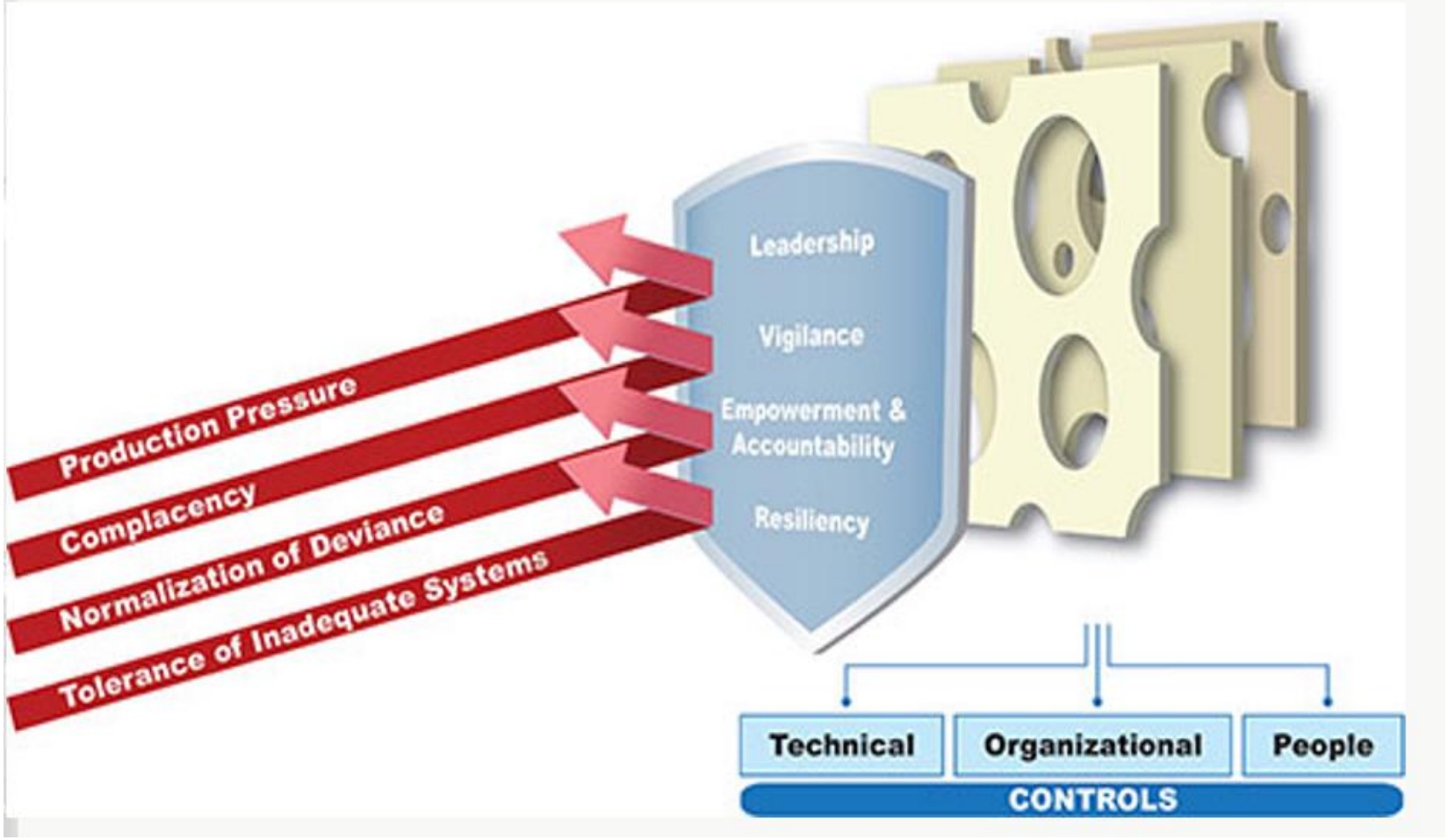
Investigation	Date	Deficiency Code
West Fertilizer Explosion/Fire	17 April 2013	1,2,3,4,5,6,7,8
Hoeganaes Corp. Fatal Flash Fire	31 Jan 2011	1
Little General Store –Propane Exp.	30 Jan 2007	1,2,5,6
Herrig Brothers Farms-BLEVE	9 April 1998	1,5
DPC Enterprises –Glendale Release	17 Nov 2003	1
Citco Refinery – HF Release/Fire	19 July 2009	2
Bayer Crop Sciences – Waste Tank	28 Aug 2008	2
DPC Enterprises –Festus Release	14 Aug 2002	1,2,3,6
Honeywell Chemical	20 July 2003	3
First Chemical Reactive Explosion	13 Oct. 2002	3
MFG Toxic Gas Release	12 April 2004	5,8
EQ Haz Waste Fire-Explosion	5 Oct. 2006	8

Inadequate/poor training	**1**	**Lack of ER Exercises**	**5**
Inadequate/poor planning	**2**	**Lack of communications**	**6**
Improper notifications	**3**	**No community/facility ties**	**7**
No IMS/ICS	**4**	**No responder ties**	**8**

Safety culture threats



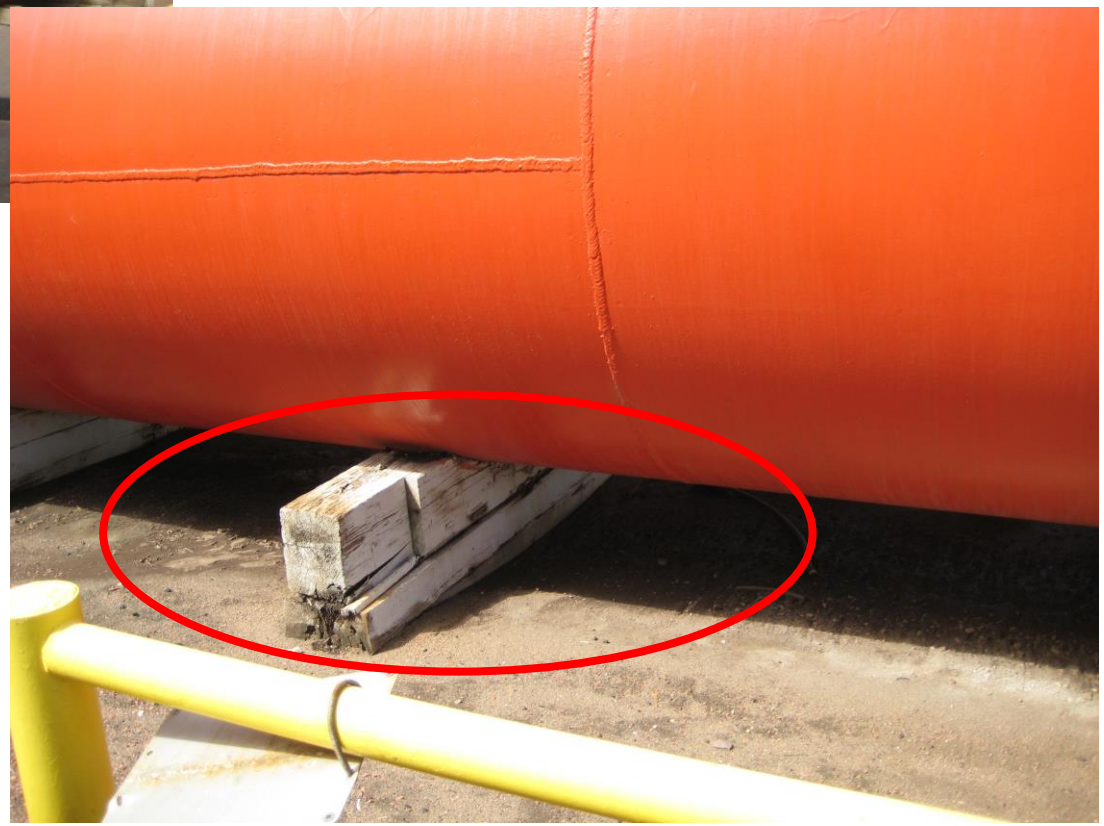
Barriers To Safety Culture Threats



COMMON INSPECTION FINDINGS

- Lack of compliance with RAGAGEP
- Findings from internal audits not resolved and documented
- Component labeling
- Failure to ensure operators receive refresher training
- Ventilation and relief system design basis
- Emergency response and planning

RAGAGEP: STRUCTURAL SUPPORTS



WHAT DOES A STRONG SAFETY CULTURE LOOK LIKE?

Weak Culture	Strong Culture
• Assigns little value to process safety	• Integrates process safety into the core values of the organization
• Has poor sense of process safety vulnerabilities	• Focuses on potential failures and strives to understand the risk and means of controlling it
• Devotes minimal resources to process safety	• Seeks to provide resources proportional to the perceived needs
• Overlooks small indications of process safety problems	• Places emphasis on learning from mistakes in order to prevent future problems
• Accepts or normalized increasingly poor safety performance	• Seeks to continuously improve process safety performance
• Relies solely on few individuals or management to determine process safety hazards and risk management activities	• Employees of all levels are involved in hazard identification and addressing the risks. Employees take action to address hazards at all levels

December 19, 2019 RMP Reconsideration Final Rule Compliance Dates

What	Due Date
Public meetings	Within 90 days of any qualifying accident that occurs after March 15, 2021
Develop Emergency Response Program	Within three years of owner or operator determining that facility is subject to the provisions
Develop exercise plans and schedules	December 19, 2023
Conduct first notification drill	December 19, 2024
Conduct first tabletop exercise	December 21, 2026
Conduct first field exercise	According to the exercise schedule established by the owner or operator in coordination with local response agencies
Submit RMP with new information elements	The owner or operator would provide new information elements with any initial RMP or RMP resubmission made ~~after December 19, 2024~~
Comply with new emergency coordination requirements	Already in effect as of September 21, 2018
Comply with remaining minor accident prevention provisions	~~Already in effect as of~~ September 21, 2018

SO WHERE DO WE GO FROM HERE?

- Establish a strong safety culture
- Think and talk about risk at your company
- Provide as much information as possible to LEPC and SERC
- Planning, preparing, and establishing Process Safety tasked work groups
- Not delaying to respond

QUESTIONS