2012 Process Safety KPIs

DSM

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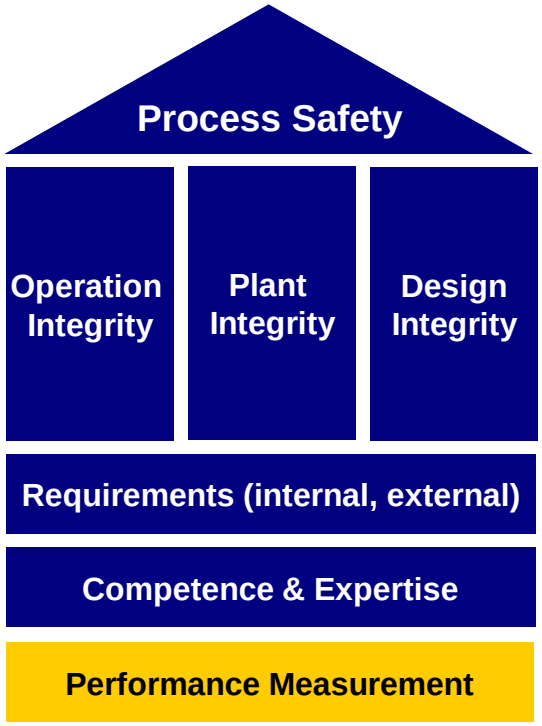
DSM PS competence manager

DSM House of Process Safety

- **Process Safety Network**
- Process Safety is held up by **3 pillars**, integrity elements
  - Operations: Training, Personal Discipline, Operability Limits, SOPs
  - Plant: Hardware design, Maintenance, Construction, Reliability
  - Design: Process design, SHE, Engineering
- Pillars are supported by 3 Bases
  - Requirements: Authorities, OSHA, EPA, PSN-GN, DSM SHE
  - Competence and Expertise: Identification of roles and qualification of people
  - Performance Measurement: **Key Performance Indicators**, indicators triggering continuous improvement



Vicente Golin da Cunha

PSI reporting

After using own thresholds, DSM adopted the reporting of Process Safety Incidents (PSI) as defined per CEFIC definition and targets reduction were defined compared to base year 2010 (193 PSI)

50 % in 5 years

75% in 10 years

Looking at PSI only is not sufficient…

Key performance indicators make process safety visible

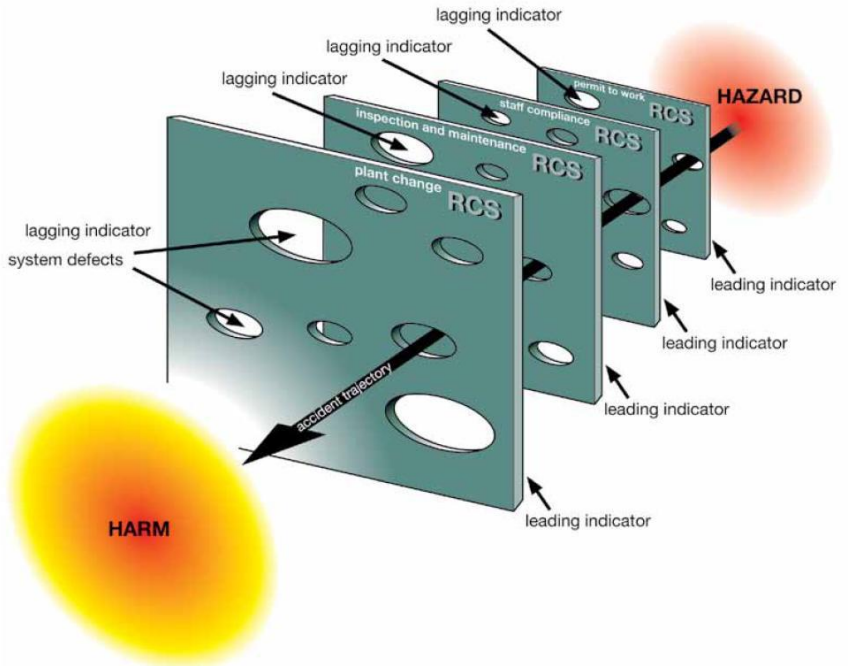
To support the plant/sites with the improvement of their process safety performance and consequently achieve the target reduction

PSI is a low number (magnitude 1 incident per site per year)

New KPI Work Process Steps/Decisions

✓ **Decide to Implement**
2) Selection of PS Key Performance Indicators
3) Collection of Data
4) Monitor & Evaluate

One example: a running pilot at a DSM site



(2) Selection on suggested PS KPIs

	House of Process Safety	Barrier or RCS	Suggested KPI's
1	Design integrity	MoC	Number of emergency MoC's, Number of MoC's and the % of in a reporting period ((# of MoC's)/(# of MoC's + # of emergency MoC's))
2			Percentage of plant change actions undertaken where an adequate risk assessment was carried out before change*
3		Process design & control	Number of demands on safety provisions
4			Cpk's of critical process safety parameters
5		Risk Ass	ecommended)
6	Operational		control measures were elves on a sample basis
7			cks by the plant staff
8			e effective, i.e.
9			
10			
11	Plant integrity	In	while being tested during
12			ithin due date (MAT 21)/ total
13	Competence & Expertise	PS Training	grams
14		Process Safety Life Cycle	Percentage of roles allocated within the PSLC (quarterly reporting is recommended)
15			Percentage of roles trained (quarterly reporting is recommended)
16	Performance Measurement	Analysis and number of incidents	Number of LOPC below corporate reporting threshold

Make an assessment of 2010 & 2011 incidents, and categorize them based on the "Barrier" Column

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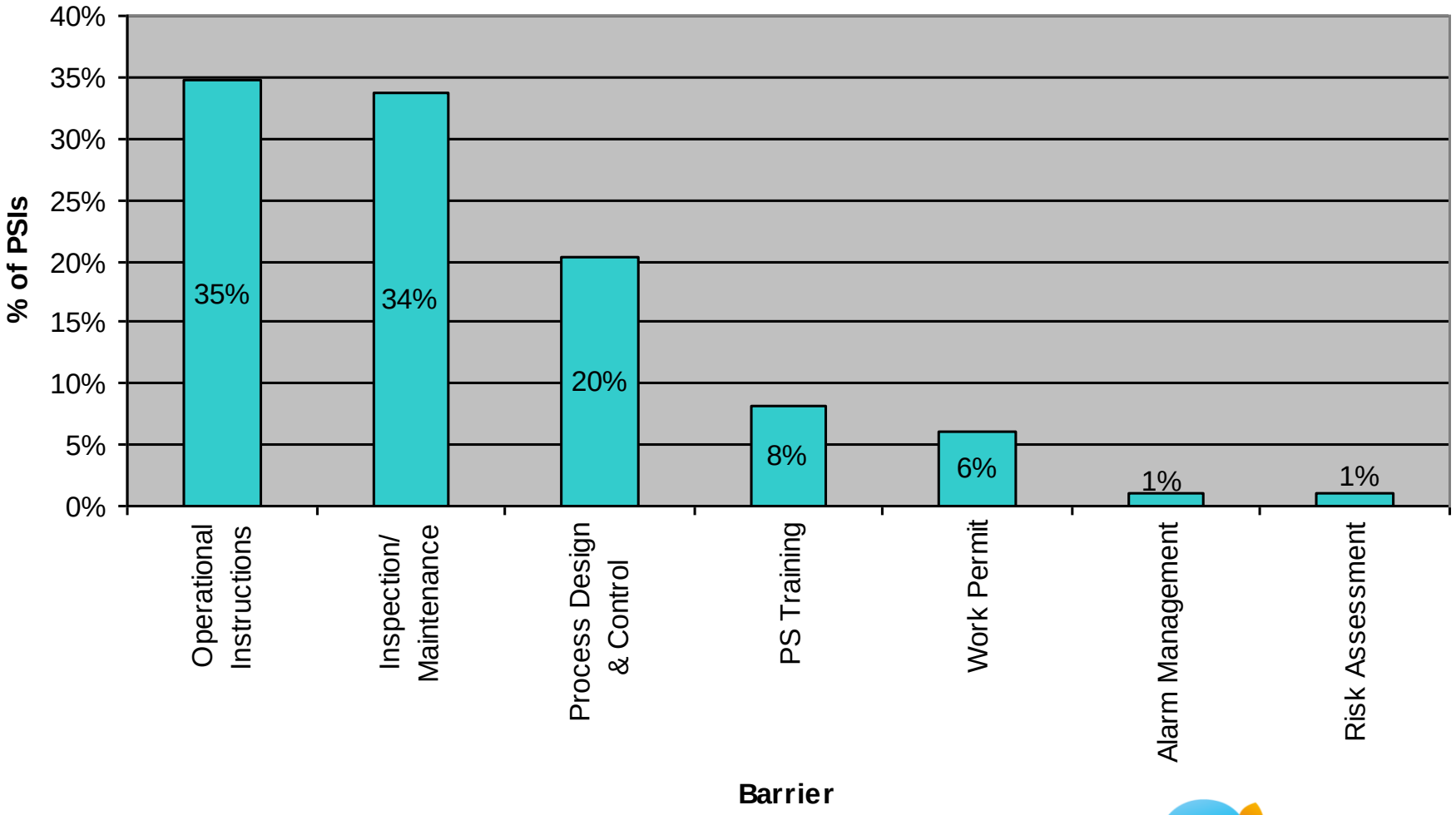
2.1 Reality check: analysis of recent incidents



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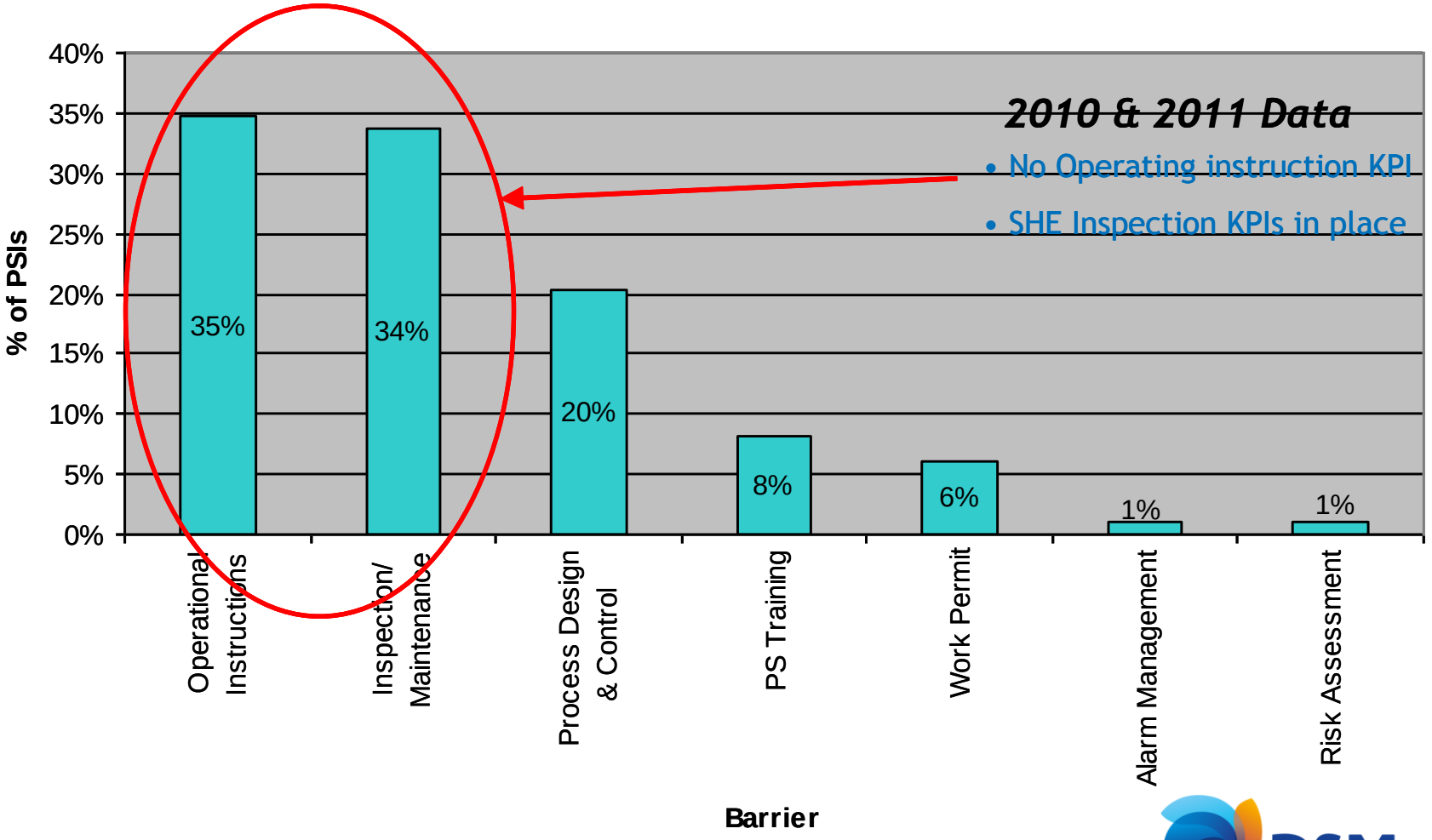

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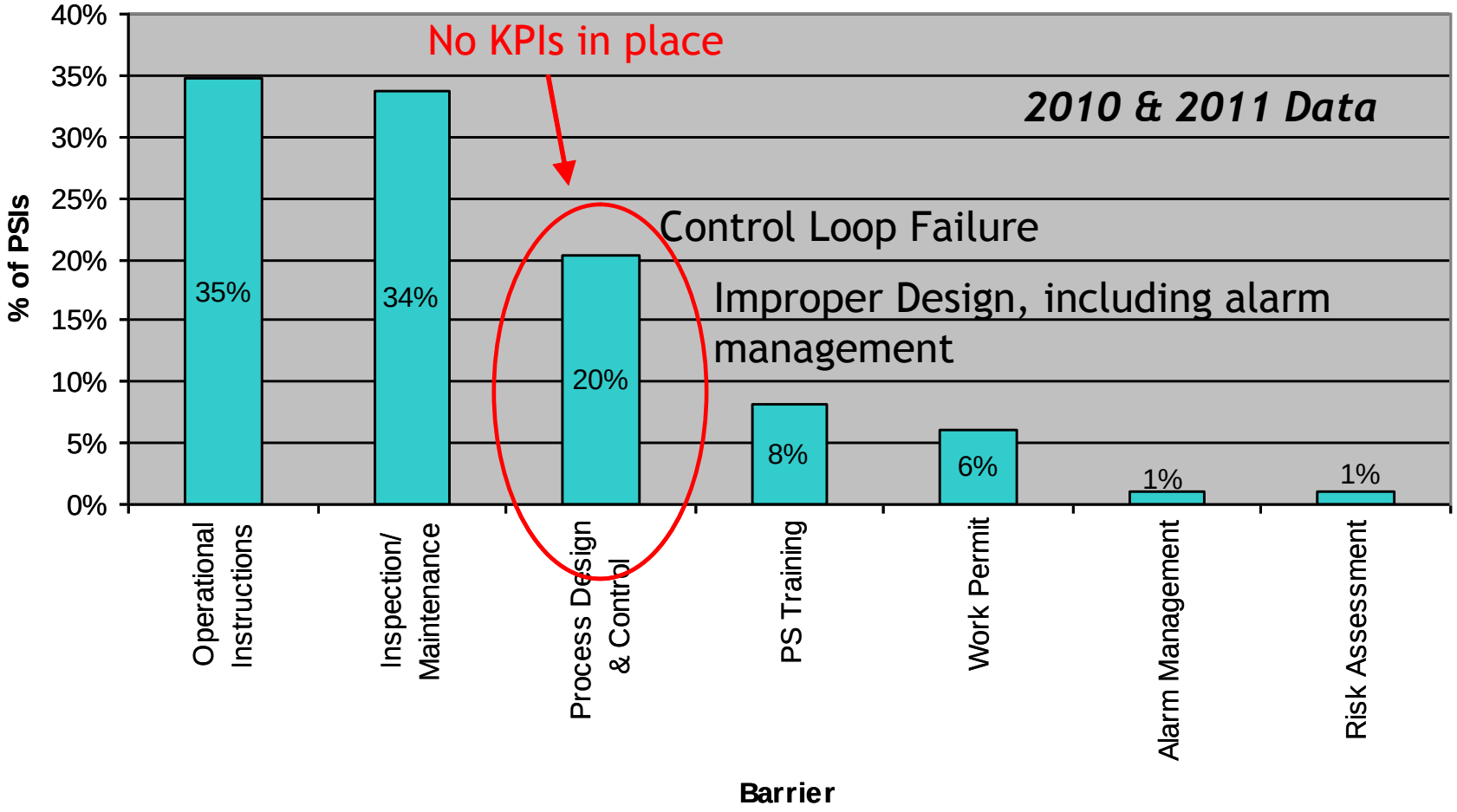

Selection of Process Safety KPIs

House of Process Safety	Barrier or RCS	DSM Suggested KPI's
Design Integrity	Process Design & Control	• Number of demands on safety provisions • Measurement of process control capability of critical process safety parameters
	Risk Assessment	Number open actions related to HAZOP
Operational Integrity	Operational Instructions	Percentage of procedures that when used, proved to be effective, i.e. covering the correct scope and/or sufficient detail
	Alarm Management	Number of alarms per control room operator per hour
	Work Permit	Percentage of work permits issued on which the hazards, risks and control measures were sufficiently specified
Plant Integrity	Inspection/ Maintenance	Number of RL Provisions that fail to operate as designed either in use or while being tested during a reporting period
Competence & Expertise	PS Training	Percentage of planned PS Training Programs

(4) Monitor & Evaluate: What the site opted for:

- Implement KPI for Operating Instructions
  - Definition in progress
- Assess effectiveness of Maintenance integrity KPIs
  - Assessment in progress

✓ Focus Areas
- ✓ Control Loops in Manual Mode
  - ✓ Lagging Indicator
- ✓ Assessed Alarm Management
  - ✓ Looked at gaps and corrective actions
  - ✓ Lagging Indicator

✓ Monitoring
- ✓ Focus areas may change as Process Safety is improved

Challenges:

- Effective measurements of operating instruction KPIs?

What is your experience in implementing KPI for operating instructions?

Other comments?

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