

Facility Integrity National Programme

Findings from
Reported Incidents

Period: Jan 2005 to Sep 2008



Facility Integrity Objectives

- Minimise potential for incidents
- Work with industry towards best practice
- Continuous improvement



Data Sources

- Accidents and dangerous occurrences reporting
- Planned Inspections – separate presentation



Incident Reporting

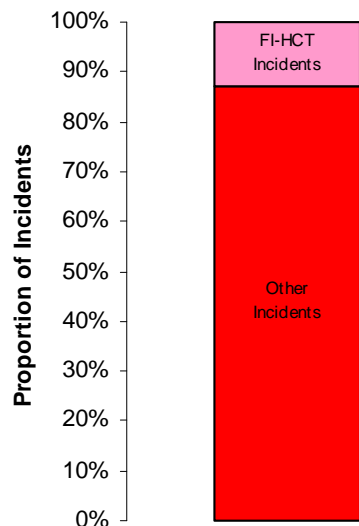
- Accidents and dangerous occurrences are reported to NOPSA under MoSOF 46
- Incident classification based on MoSOF Reg 45
- Assigned Root Causes are TapRoot[®] categories of
 - Equipment Difficulty
 - Human Performance Difficulty
- HC releases detailed in standardised Uncontrolled HC Release Report form

FI-HCT Incidents

Totals to Sep 2008

Total Overall Proportion of Facility Integrity Incidents

Jan 2005 - Sep 2008



	All Incidents Quarterly Totals	FI-HCT Quarterly Totals	% FI-HCT per Quarter	All Incidents 12-monthly Totals	FI-HCT Rolling 12-monthly Totals	% FI-HCT per 12-months
Q105	38	1	2.6			
Q205	35	5	14.3			
Q305	33	6	18.2			
Q405	44	7	15.9	150	19	12.7
Q106	58	10	17.2		28	
Q206	67	8	11.9		31	
Q306	46	10	21.7		35	
Q406	46	7	15.2	217	35	16.1
Q107	56	15	26.8		40	
Q207	66	6	9.1		38	
Q307	75	11	14.7		39	
Q407	63	5	7.9	260	37	14.2
Q108	90	10	11.1		32	
Q208	107	11	10.3		37	
Q308	104	6	5.8		32	
	928	118				

FI Incident Scope

This presentation covers only one incident type:

Actual Hydrocarbon Releases from Topside Process Equipment (HCT)

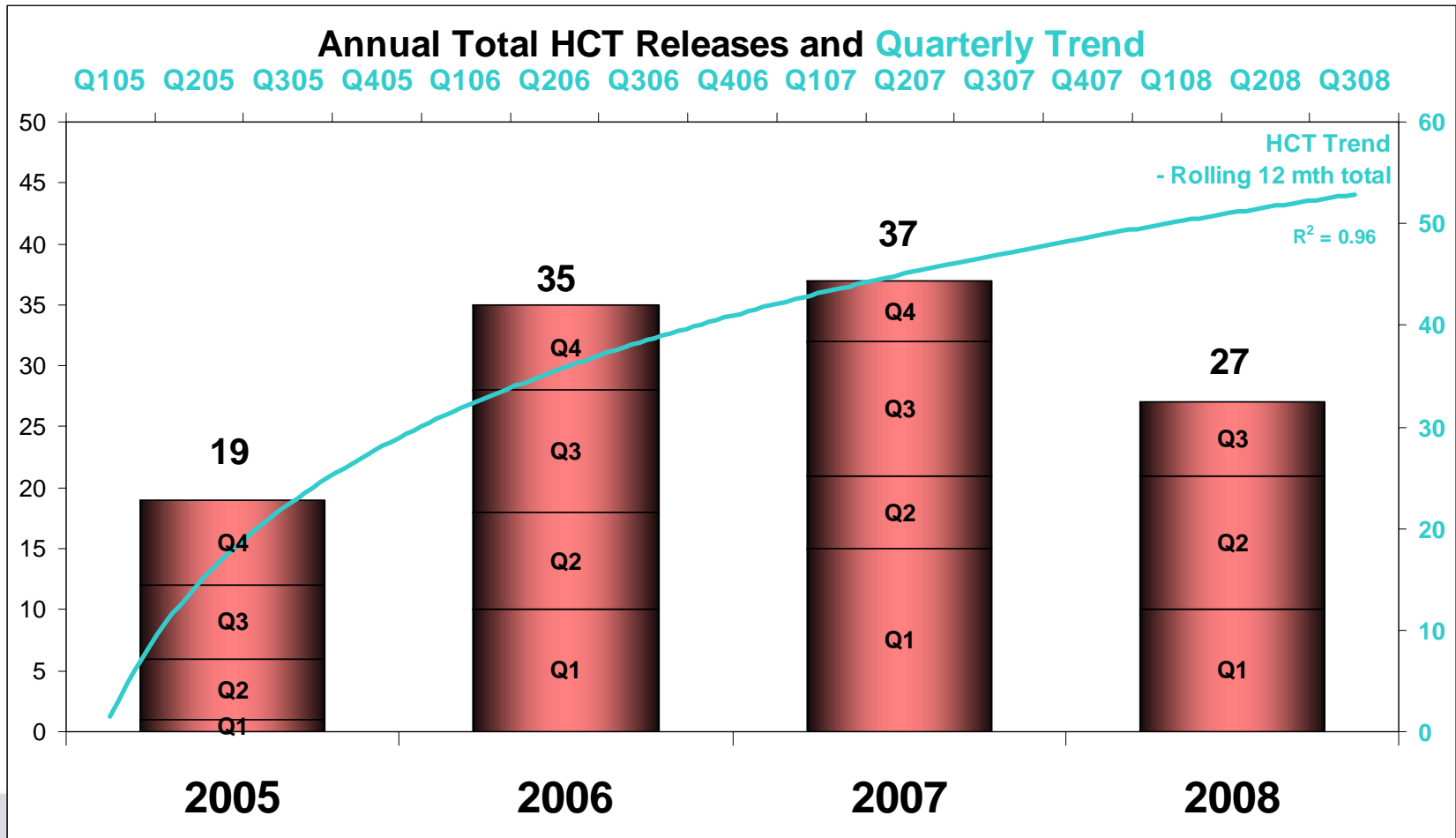
Hydrocarbon Releases INCLUDE: Condensate, Vapours, Gas,
Petroleum Liquid, Produced Water

Non-process releases are EXCLUDED:
Lube oils, hydraulic oils and fuel oils



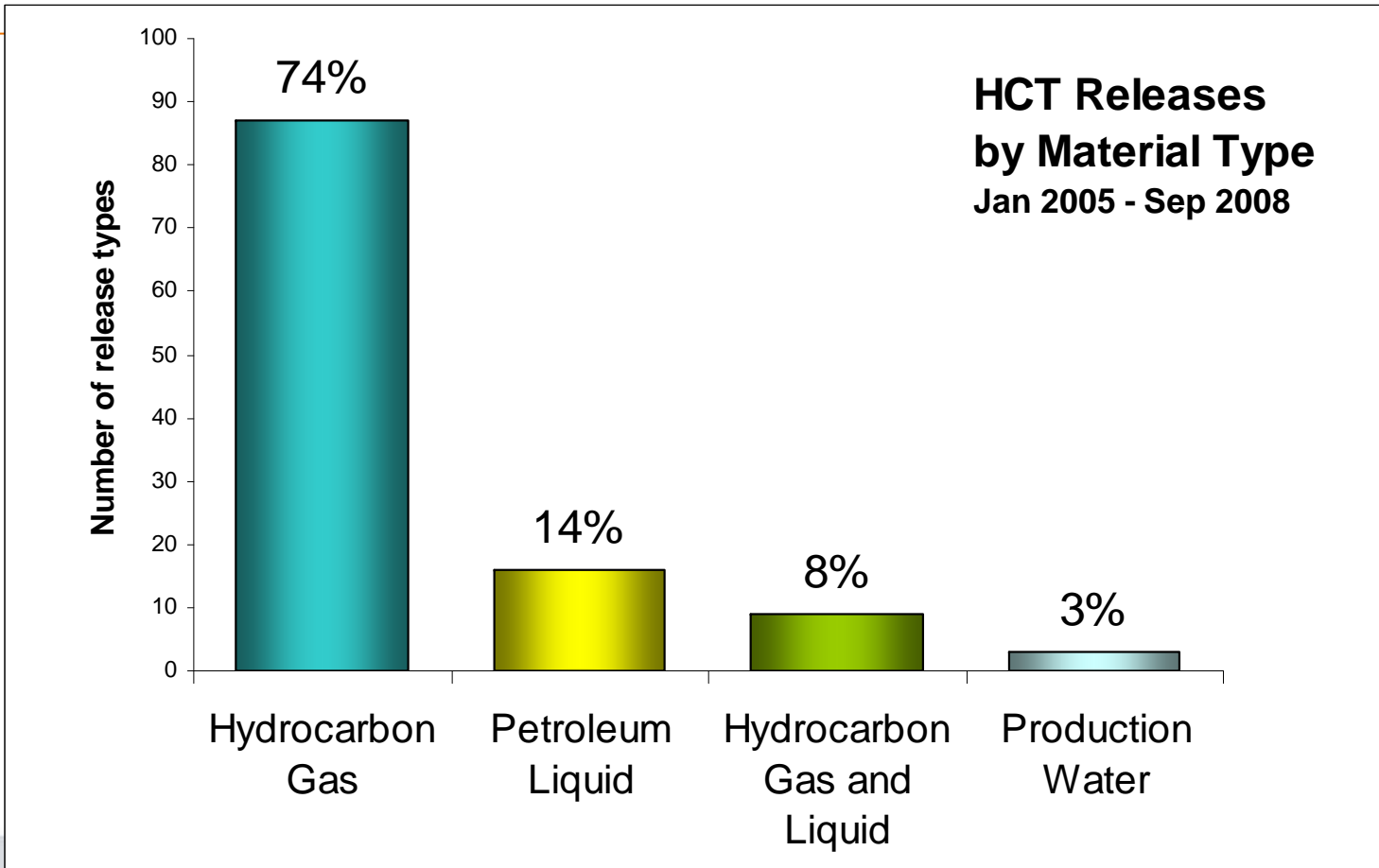
HCT Releases

Annual Totals



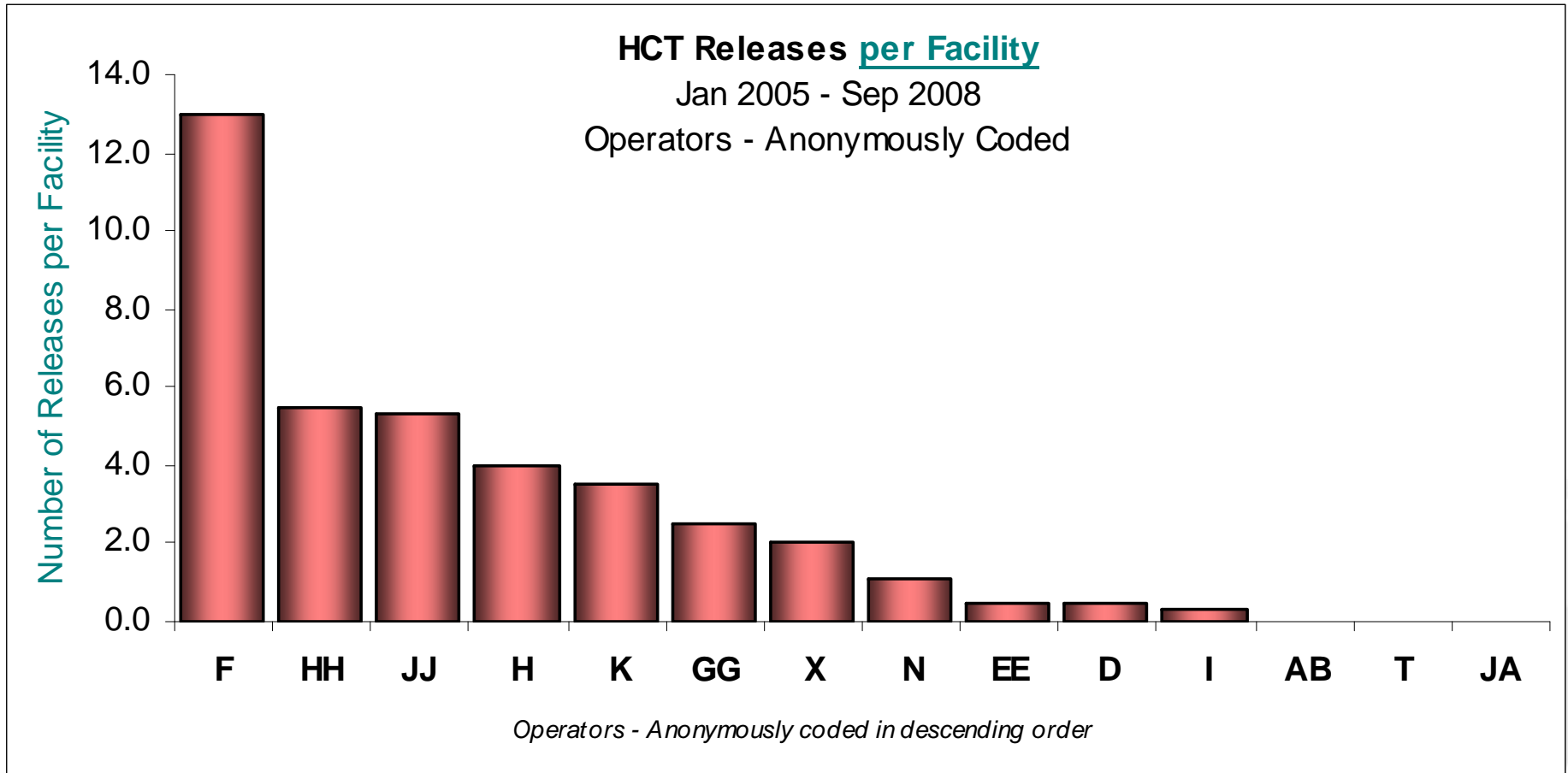
HCT Release Incidents

Release Material Type



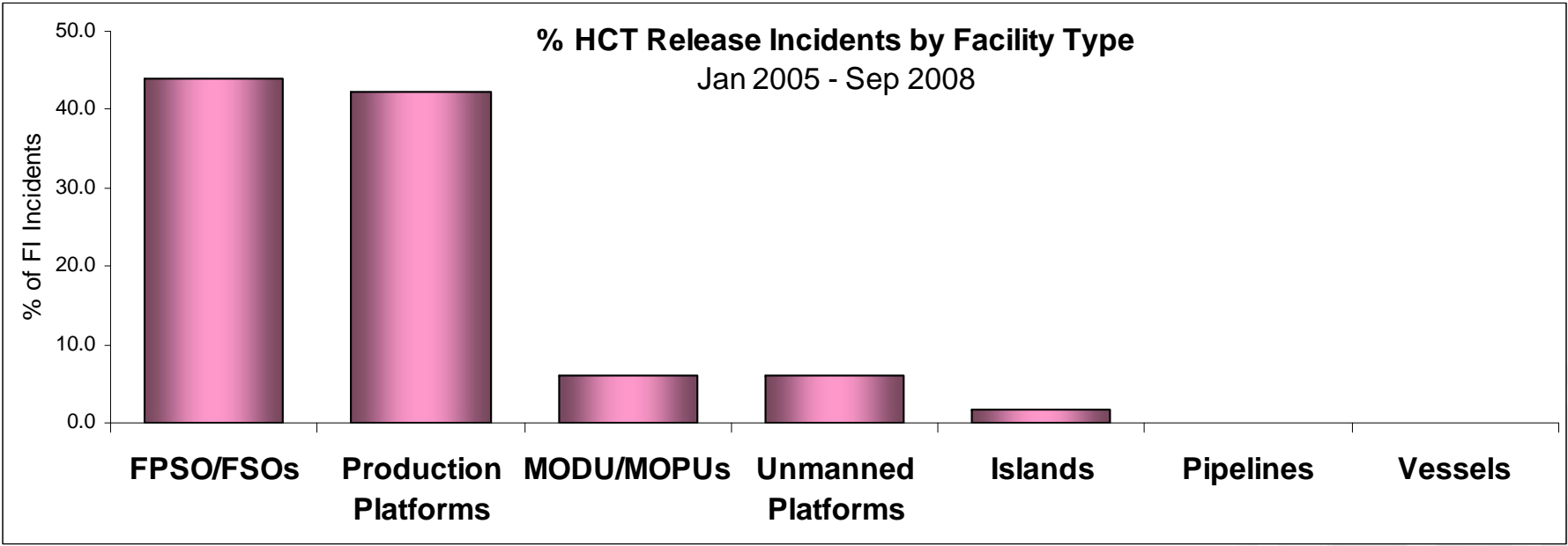
HCT Releases by Production Operators

Incidents per Facility

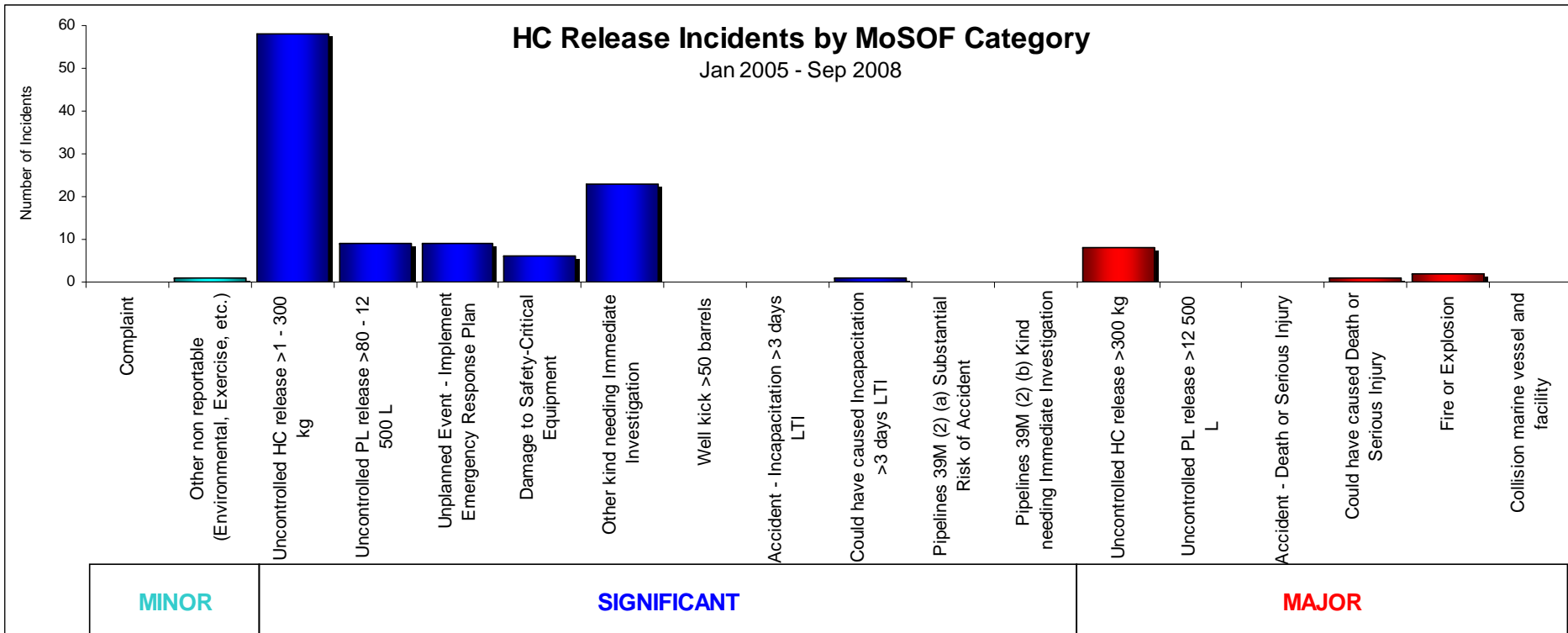


HCT Release Incidents

Production Facility Type



HCT Incidents by Categories



Primary Root Cause People or Equipment

- ED – Equipment Difficulty
- HPD – Human Performance Difficulty

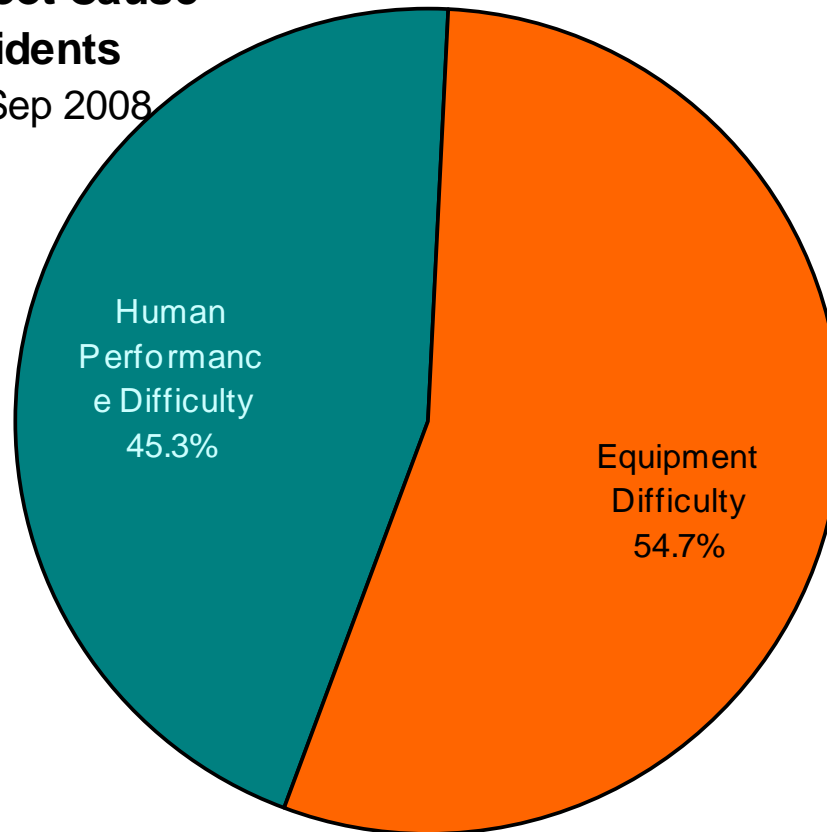


HCT Release Related Incidents

Primary Root Cause (ED or HPD)

Primary Root Cause of HCT Incidents

Jan 2005 - Sep 2008



ED TapRoot® categorisations

Specific Root Causes

Design

Design Specs / Review Required

Equipment / Parts Defects

Manufacture / Procurement / QC / Storage / Handling

Preventative / Predictive Maintenance

Deficient / None

Other – minor

Tolerable Failures

Repeat Failure / Management System

Corrective Action Required / Not implemented

HPD TapRoot[®] categorisations

Specific Root Causes

Training Needs improvement / Not provided

Procedures None / Not followed

Quality Control No inspection / Deficient QC

Communications None / Not timely / Misunderstanding

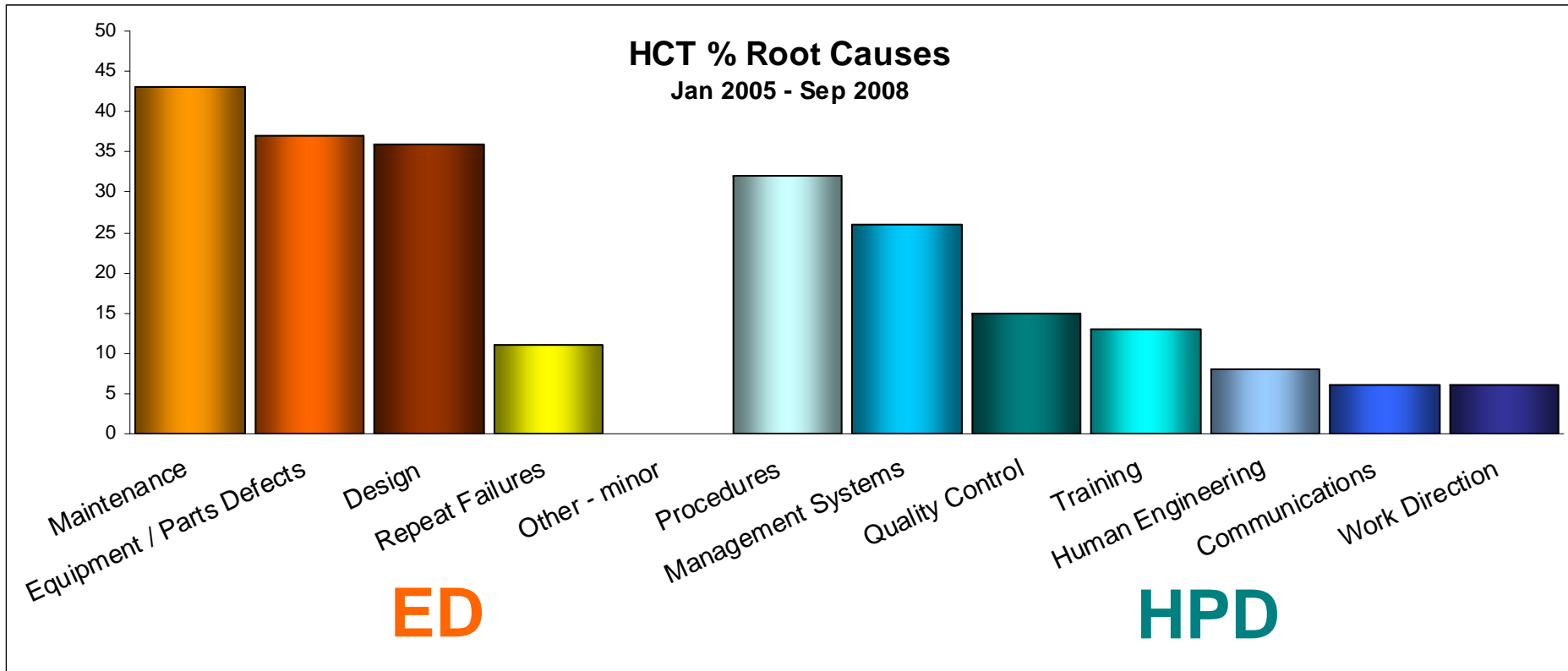
Management Systems Standards, Policies, Admin Controls NI /
Not Used / Oversight / Corrective Action

Human Engineering HMI / Work Environment / Complex Systems
/ Non-Fault Tolerant System

Work Direction Preparation / Selection / Supervision

HCT Incidents by Root Causes

Primary, Secondary and Tertiary



Failure Mechanism Analysis

ED Focus Areas

Structural integrity

Physical damage, loose connections, vibration, fatigue

Corrosion / Erosion

Internal / external corrosion, pinholes, sand erosion

Small-bore Piping

Small piping, hoses & tubing damage, loose fittings

Pressure Integrity

Wellhead damage, flange leaks, mechanical seal leaks

Process Integrity

Process vessel & piping upset, PSV / Bursting disk activation, overflow, rotating machines surges/upsets



*Note: these topics are aligned with the
Planned Inspection prompt sheets*

Failure Mechanism Analysis

HPD Focus Areas

Integrity Management System

Plan, Do, Check, Review –

Human Errors & Procedural Control Failure

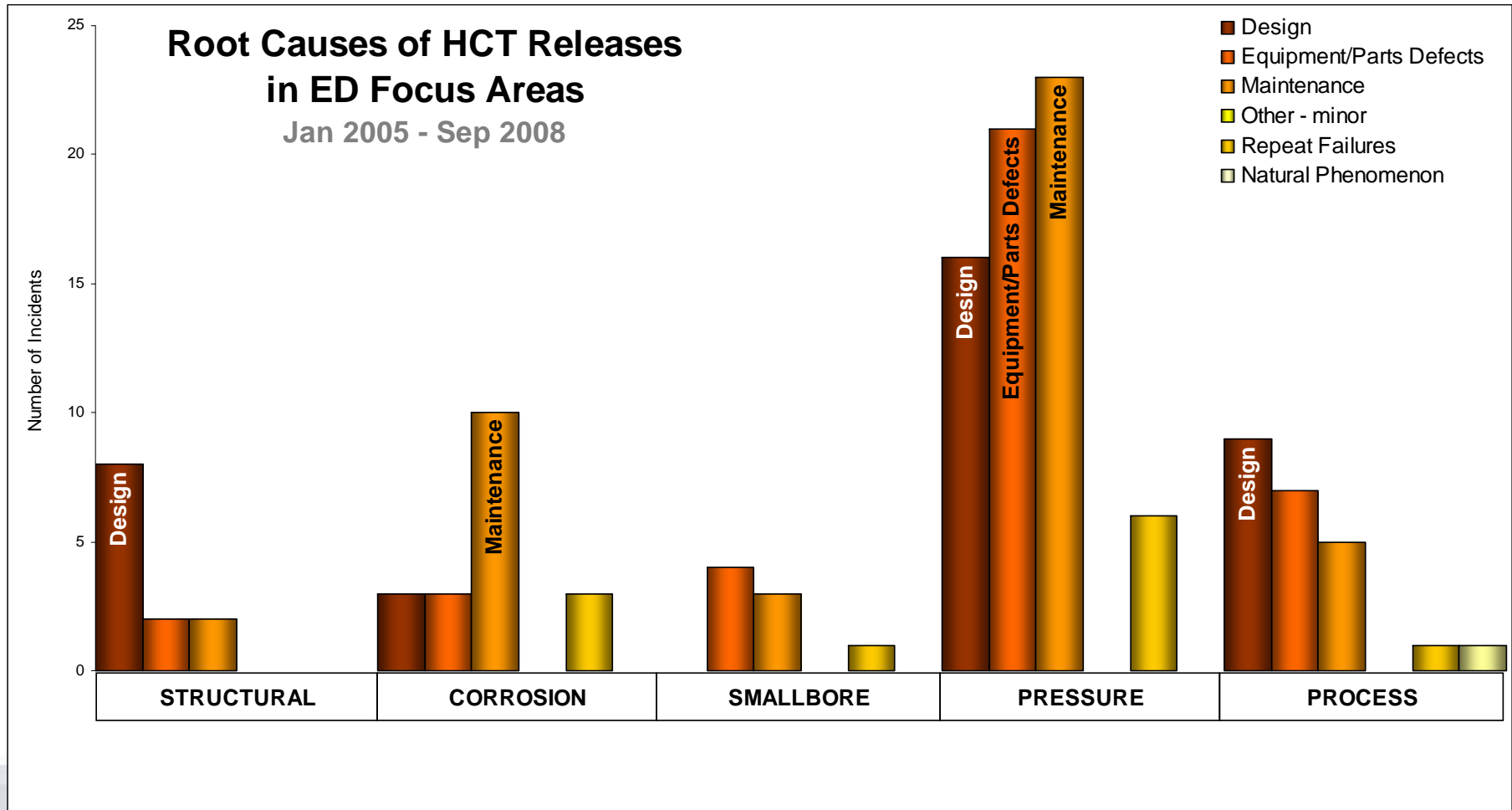
Maintenance Management System

Human Errors & Procedural Control Failure



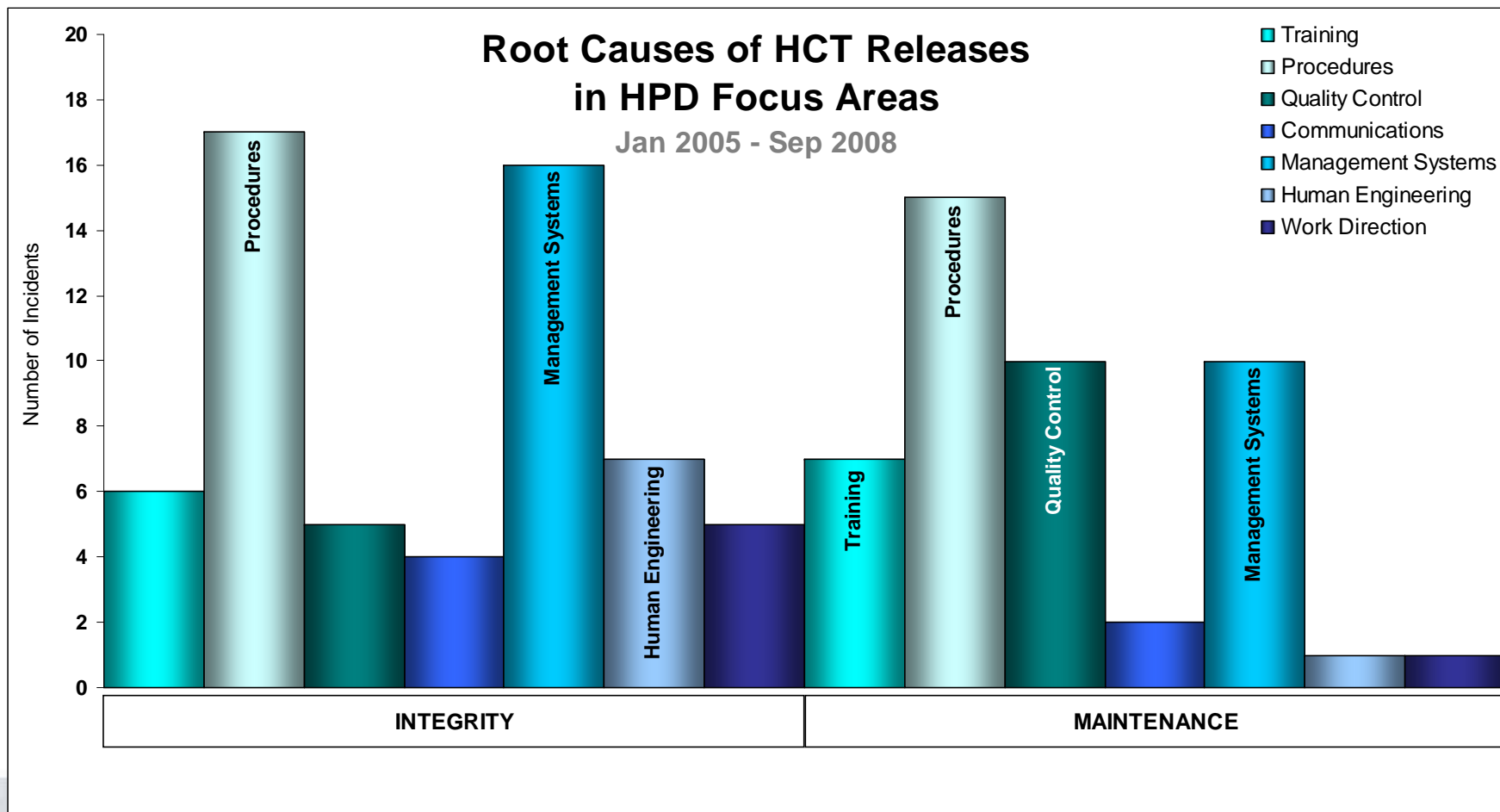
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HCT Releases by Root Cause ED Focus Areas



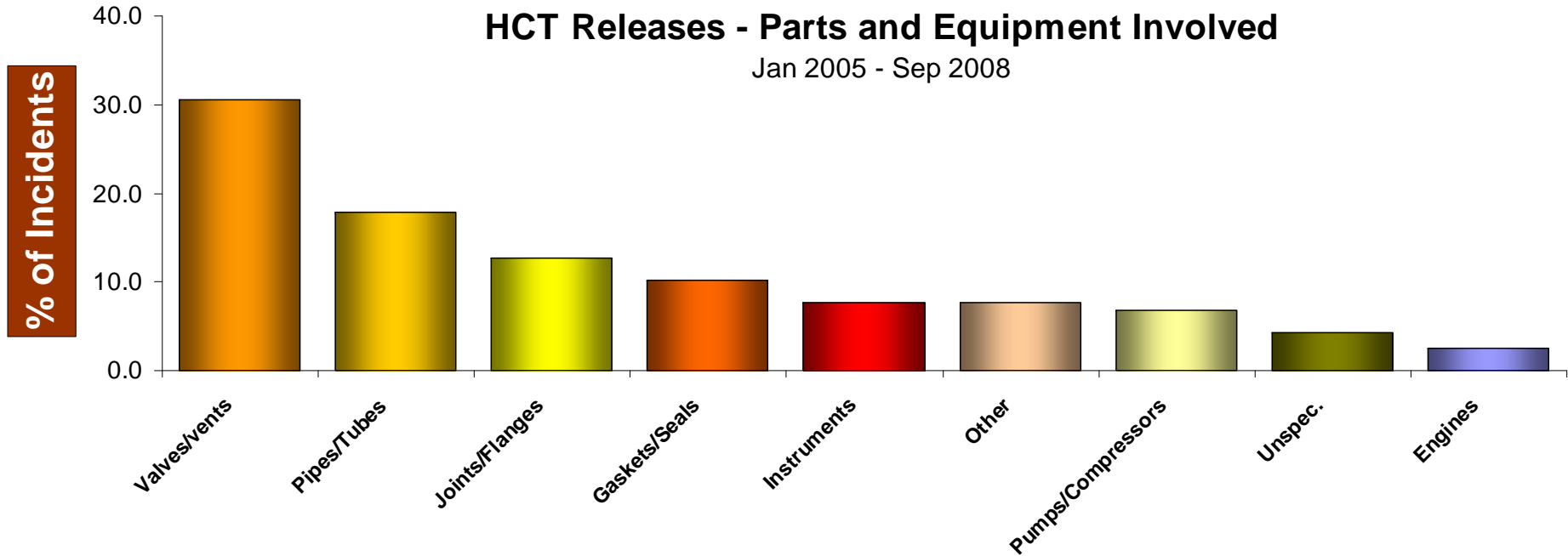
Note: An incident may have multiple root causes

HCT Releases by Root Cause HPD Focus Areas



HCT Releases

Parts/Equipment Involved



FI Conclusions

Reported Incidents

HCT Releases

- 13% of all incidents.
- $\frac{3}{4}$ of HCT releases are hydrocarbon gas, 9% are **MAJOR** releases >300 kg
- equal number of releases on FPSOs and production platforms

Root Causes

- Parts implicated in 30% of all incidents = VALVES
- ED major contributors =
 - Maintenance
 - Equipment /Parts Defects
 - Equipment Design
- HPD major contributor =
 - Procedures
 - Management Systems
 - Quality Control



End of Presentation

THANK YOU
FOR YOUR ATTENTION

