Measuring how we are doing: Key Performance Indicators

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Performance you can rely on.

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Summary

- Introduction – Infineum
- Operations Integrity Management System
- Key Performance Indicators – KPI
- Examples of KPI
- Examples of KPI trens for Infineum Italy Srl

Infineum as a Company

- **Independent lubes and fuels additives company**
  - Established in January 1999 as a 50:50 joint venture between ExxonMobil and Shell, bringing together their respective Additive Divisions
- **A world leader in the formulation, manufacture and marketing of additives for the fuel and lubricant industry**
  - More than 80 years of experience within the additives industry
  - More than 1,900 global patents and patent applications
- **Approximately 1,900 colleagues globally, in multicultural, multifunctional teams**
  - Global Corporate HQ in UK
  - Regional business centres in UK, USA, China and Singapore
  - Sales and Marketing representation in more than 70 countries
  - R&D facilities in the UK, USA, China, Japan and Singapore
  - Global manufacturing facilities strategically located

Global company footprint

Infineum in Italy: Vado Ligure Manufacturing Site

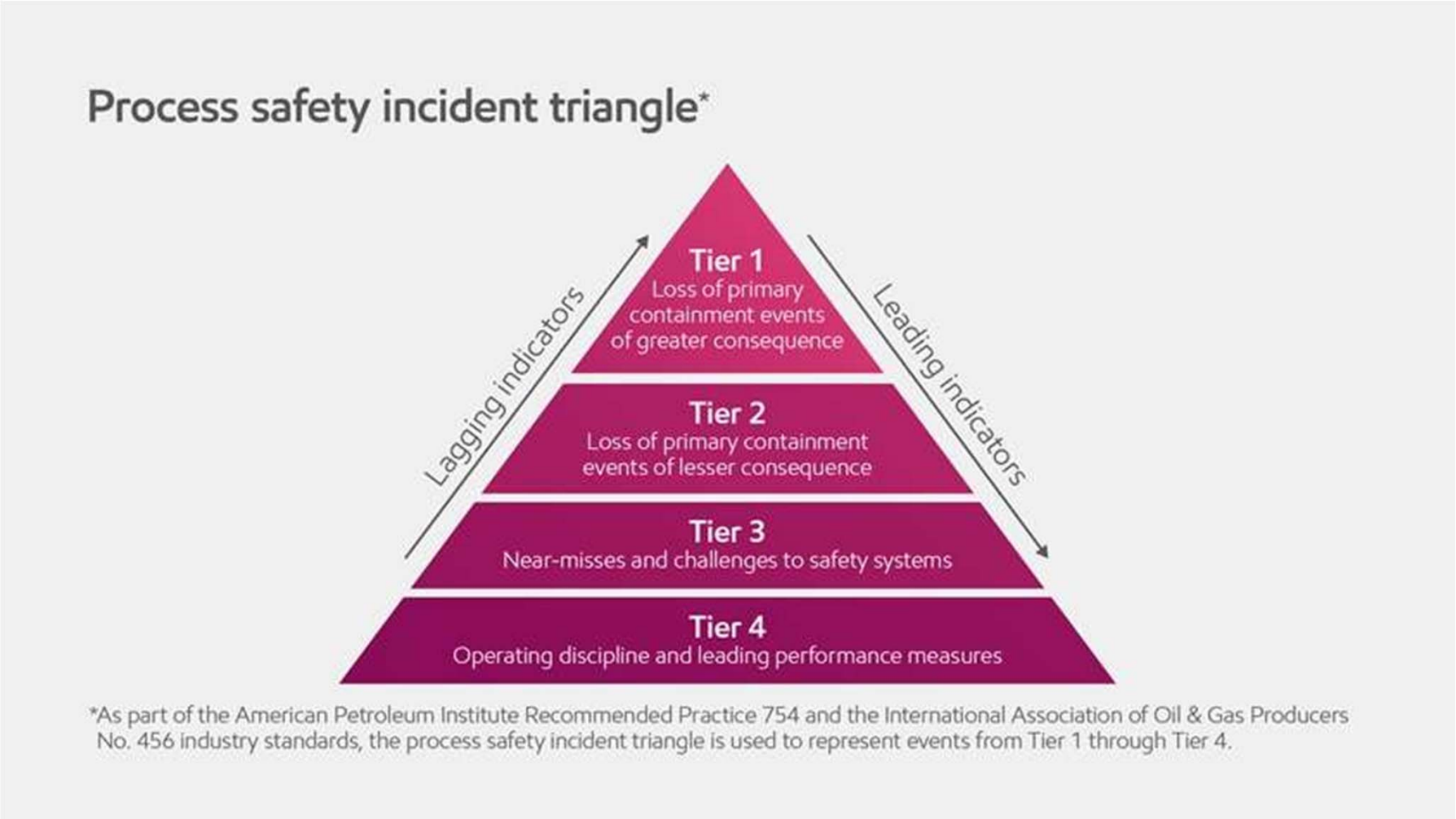
- Built grass-roots in 1967 by Exxon Chemicals and steadily expanded
- Plant area: 90000 m^2 paved and fenced, owned by Infineum
- Stand-alone plant with all the needed utilities and services
- Automated batch processes at low temperature (max 300°C), and pressure (max 3 barg)
- Main process hazards: toxics (Cl_2, H_2S, SDC, HCl), flammables (alcohols), substances dangerous for the environment (H400/410/411)
- 24/7 Operations both in the plant and in the lab.

Operations Integrity Management System - OIMS

Key Performance Indicators

- KPIs tell us how our system is performing
- Each system element records its own key performance indicators and uses them to evaluate performance and drive continuous improvement
- A number of indicators relevant to the system overall performance are picked-up by the «Driver» and «Evaluation» elements to close the continuous improvement cycle for the whole system
- Indicators must be «S.M.A.R.T.»
  - Specific
  - Measurable
  - Achievable
  - Relevant
  - Time-phased
- «Lagging» and «Leading» indicators
- Indicators can be broadly divided in groups:
  - «Activities versus plan» (mostly a leading indicator)
  - «Actions follow-up» (leading indicator)
  - «Violations/Deviations», Compliance to rules/practices (lagging indicator)
  - «Events»: incidents / near misses

Leading and Lagging Indicators for Process Safety



Leading Indicators: «Activities» VS plan»

Activities yearly plan => **indicators (checked every 3/6 months) tell us how well we are doing**

- N° of risk assessments (HAZOPS, Fire Protection Surveys, Safety Relief Reviews, High Potential Scenarios Reviews, Environmental Aspects Reviews…)
- Safety and housekeeping «surveys»: field checks/surveys …
- Behaviour Based Safety Observations (BBSO)
- Work Permit audits (documentation and field checks)
- Industrial Hygene & Exposure assessments
- Training Programme status
- Operating Procedures Reviews
- Safety Critical devices periodic checks/maintenance
- Equipment inspections
- Emegency drills
- Internal and external legal compliance reviews

Leading indicators: «Actions Follow-up»

% Overdue (versus planned due date) => goal: reduce n° of overdue actions

Follow-up actions => continuous improvement cycle

Performance indicators - % overdue:

- Actions from various risk assessment (HAZOPS, Fire Protection Surveys, Safety Relief Reviews, High Potential Scenario Reviews, Environmental Aspects Reviews …)
- Actions from near-misses and incidents investigations
- Actions from equipment inspections
- Actions from legal compliance reviews
- Actions from system audits (internal / external), certifications ISO14001, OHSAS18001
- Actions from emergency drills

Lagging indiators: «Deviations / Violations»

Compliance to rules and practices => **discipline and risk awareness. Indicates that an important safeguard was not in place.**

Indicators:

- «Life Saving Rules» violations
- % of work permits found compliant during surveys
- % of safety critical equipments/devices that passed the periodic inspection
- n° of regulatory compliance incidents (environmental violations, fines, infringments …)
- unapproved deviations from engineering standards discovered
  - during the project «pre-startup safety review»
  - during risk assessments
- overdue temporary «Management of Changes» versus original due date.

Lagging indicators: «Events»

- INCIDENTS => lagging indicator
- NEAR-MISSES => lagging/leading indicator (depending on the potential severity)

Performance indicators

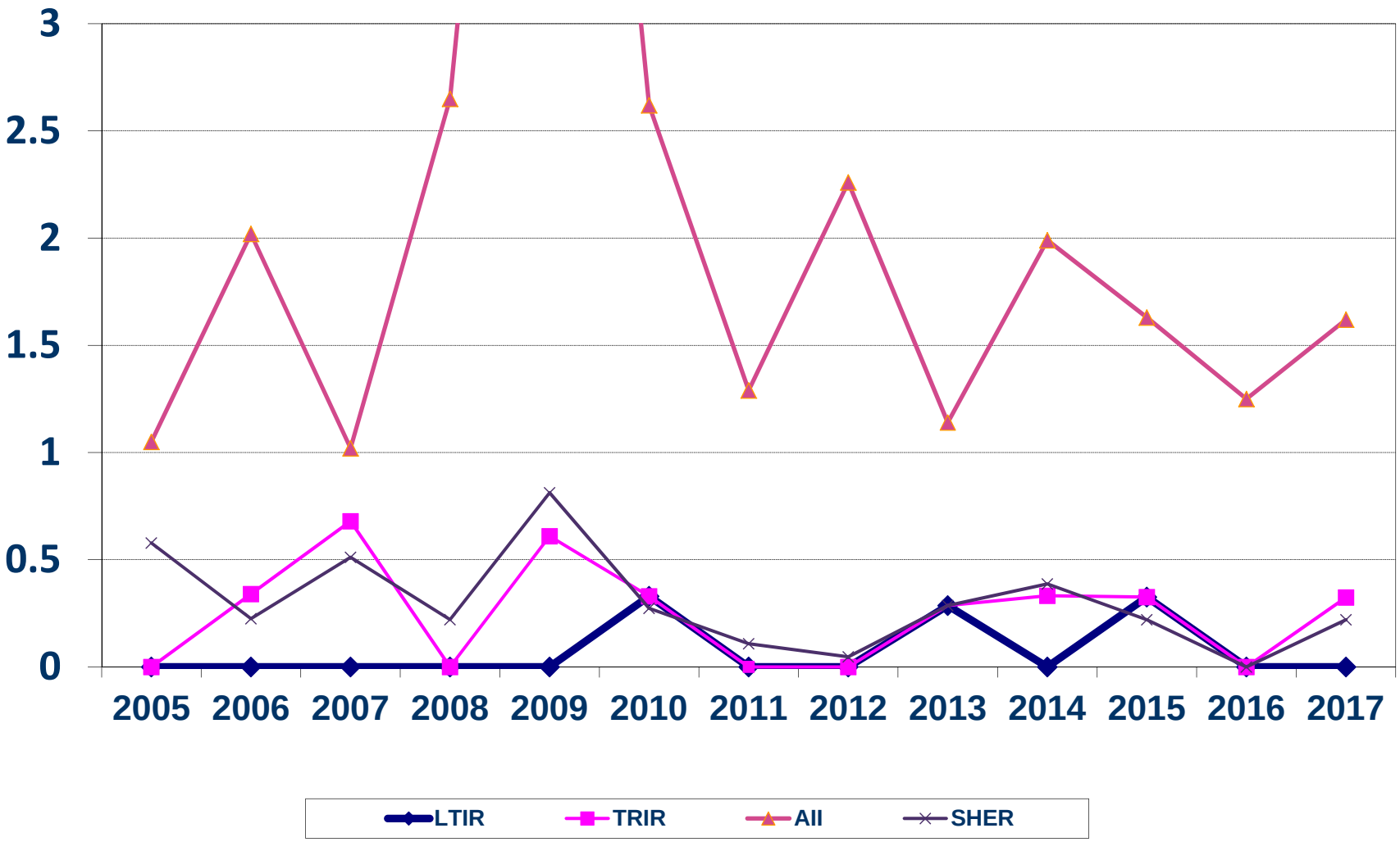
- n° of HSE incidents for each system element
- n° of HSE near-misses for each system element
- for PROCESS SAFETY incident/near-miss => evaluate the actual and potential consequences to drive the appropriate level of investigation
- root cause analysis summary: human factor, equipment, work practices, training, risk assessment …
- TRIR (total recordable incident rate)
- Spills and environmental releases
- Waste generation

Examples of trends for Key Performance Indicators

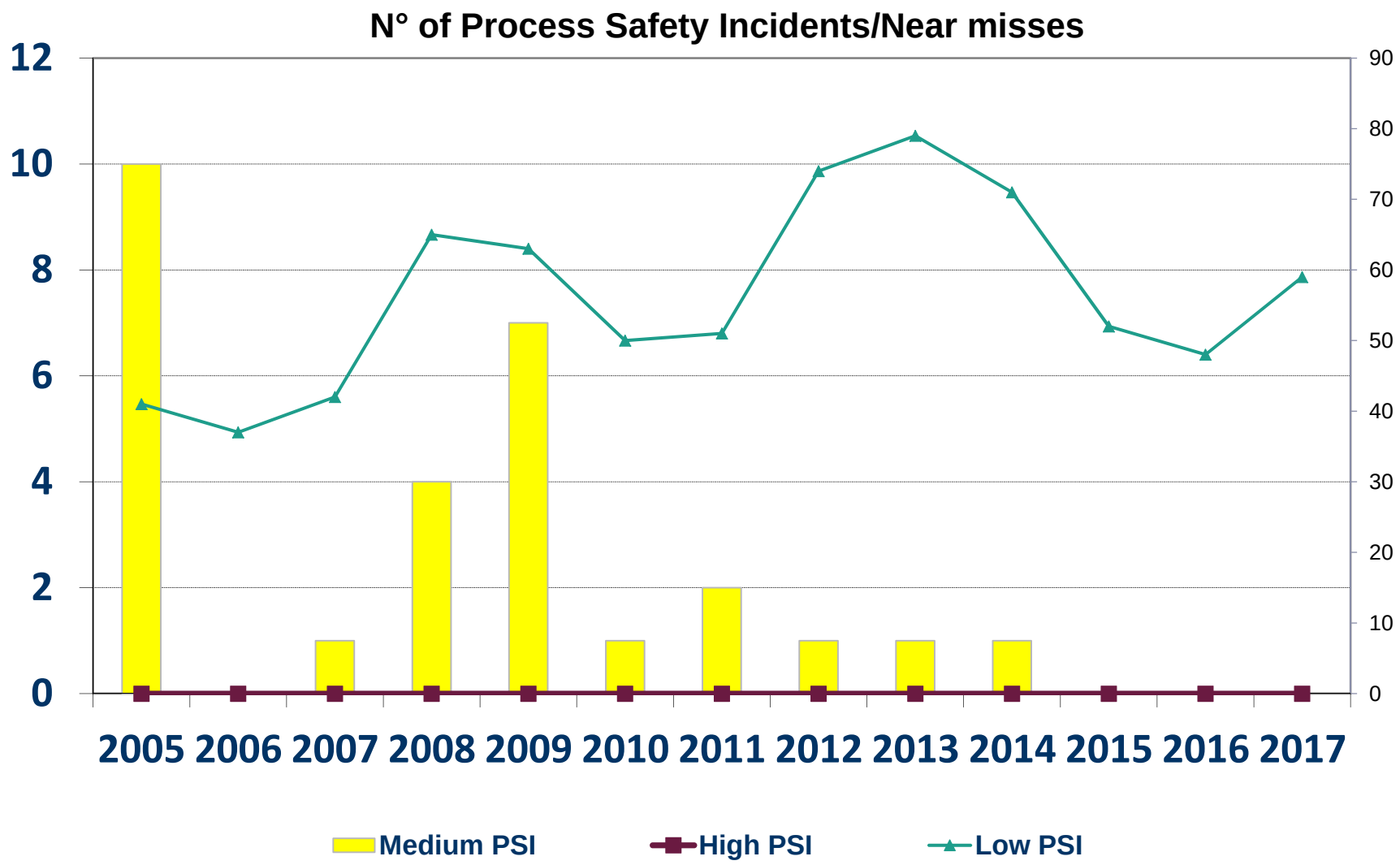
The multi-year trend for KPIs is what we need to monitor our system and to confirm continuous improvement is actually effective

- Personnel Safety Indicators
- Process Safety Indicators
- Environmental Indicators
- Significant HSE Event Rate (a combination of the above ones)
- % Overdue findings from risk assessments
- Work Permits checks

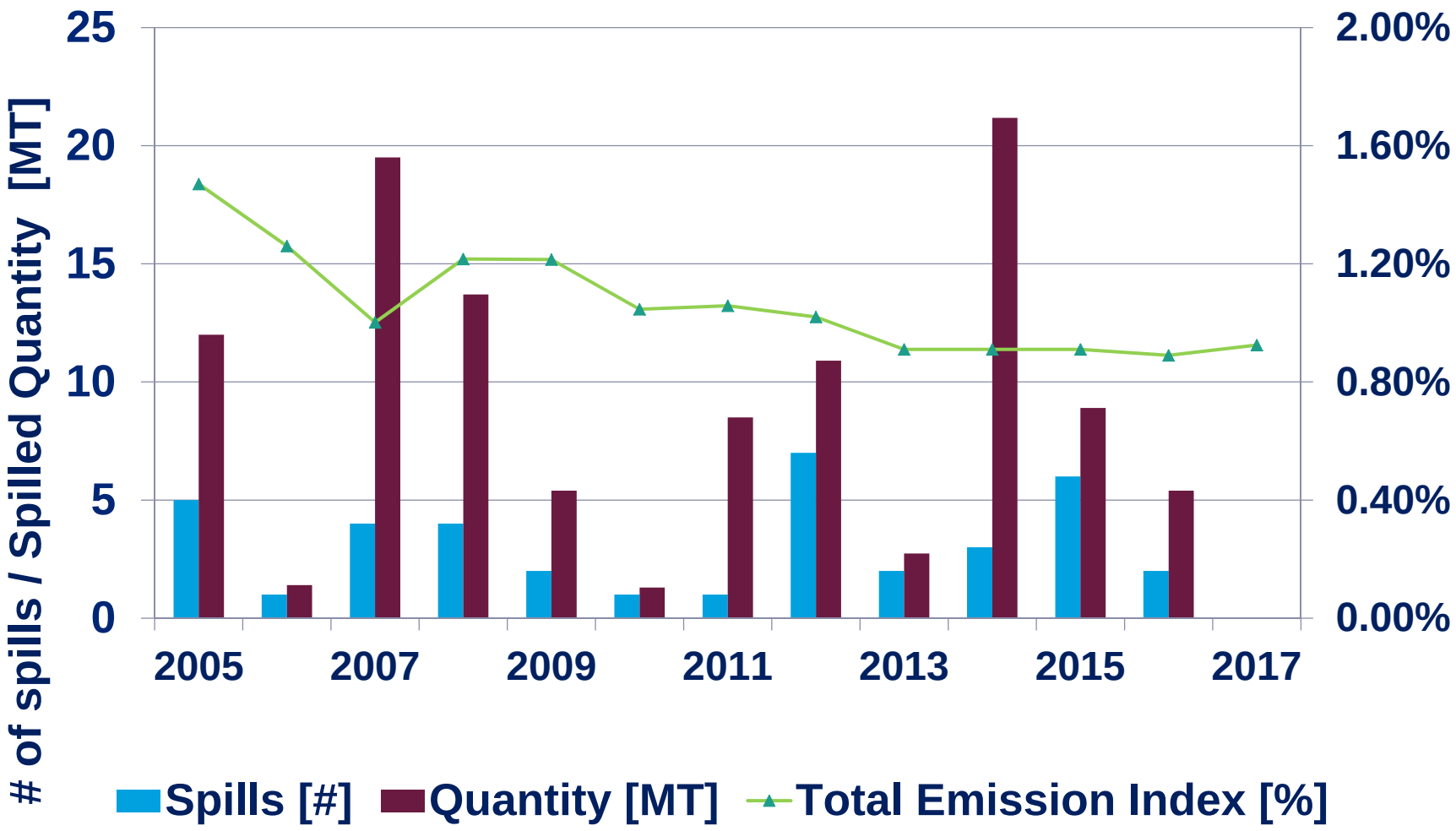
Personnel Safety Indicators



Process Safety Indicators

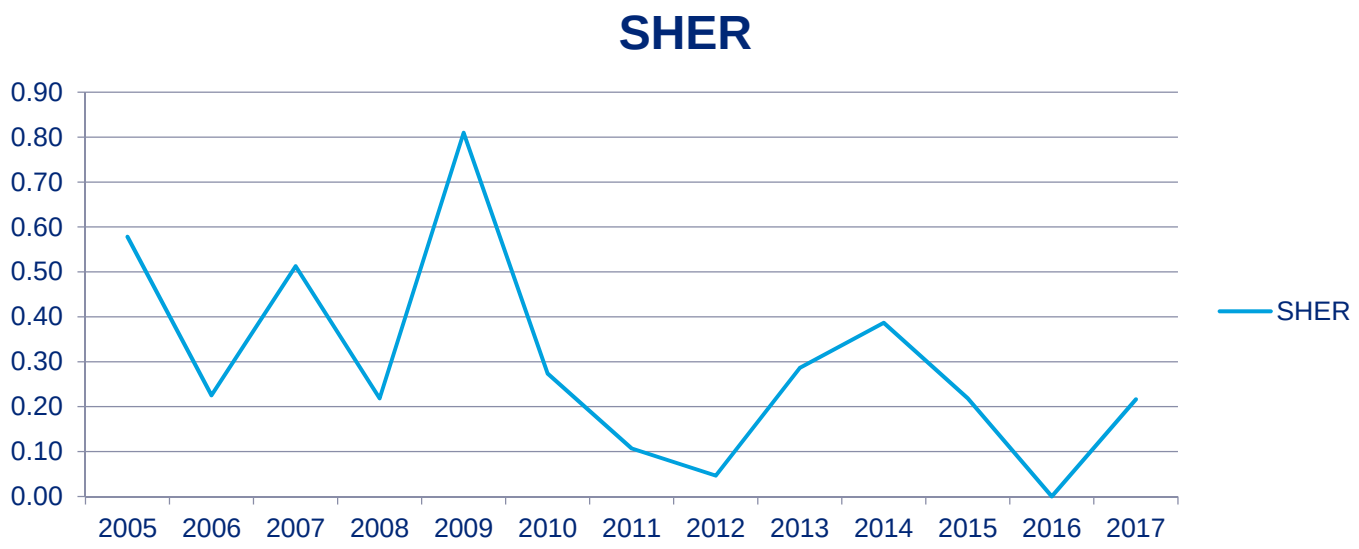


Environmental Indicators

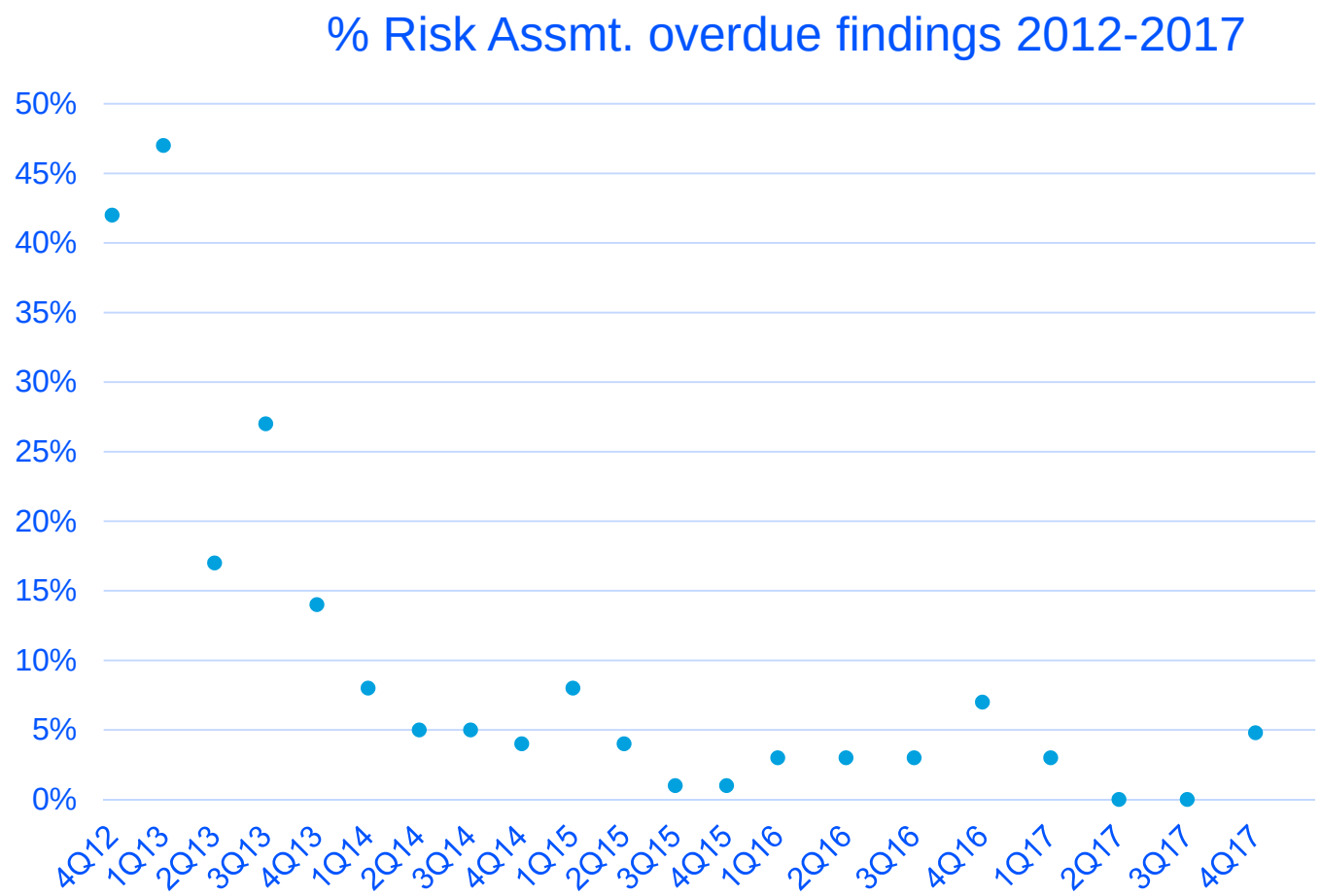


Significant HSE Event Rate - SHER

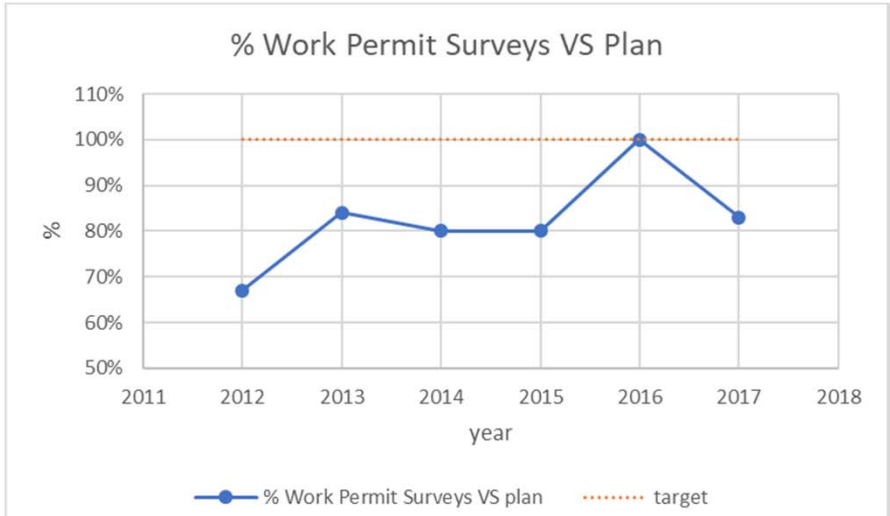
- SHER (Significant HSE Event Rate) is an index calculated as a weighted combination of recordable injuries (RI), significant process safety incidents (SPSI) and notifiable environmental releases (NER). SHER is expressed as an incident rate per 200,000 hours just as we do for TRIR. As a reminder, 200,000 hours is roughly the hours worked by 100 people in a year.

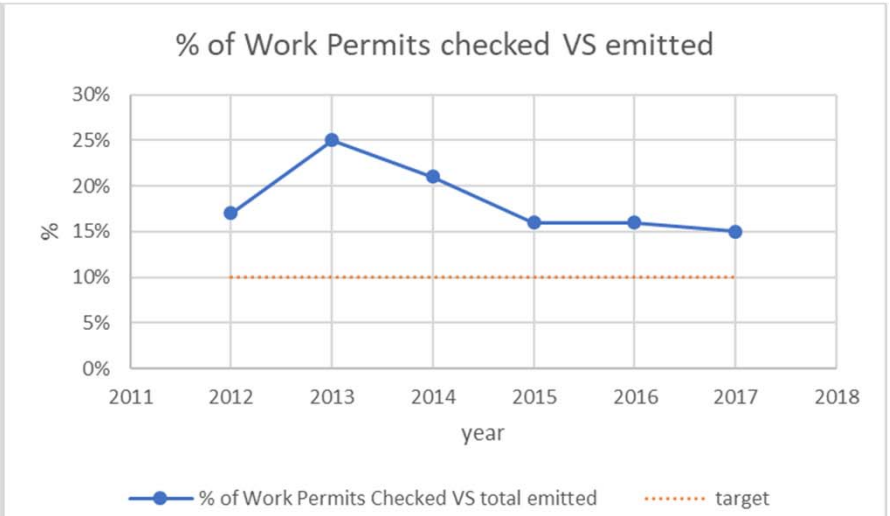


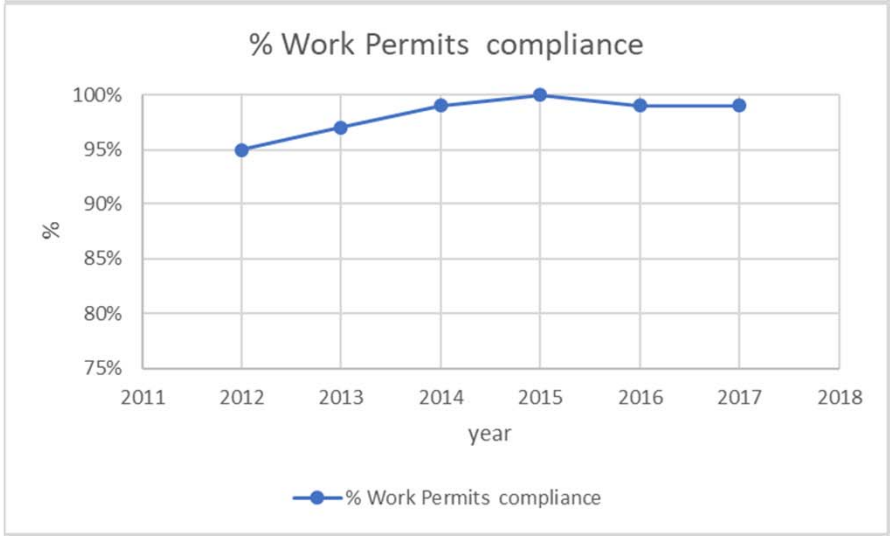
Examples of trends for performance indicators

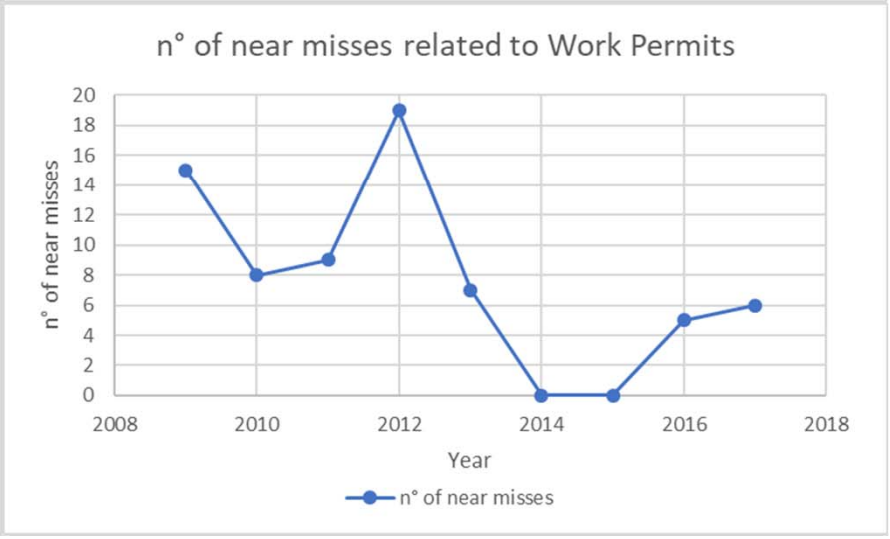


Work Permits Checks









Conclusions

- Various idicators can be used to measure the system performance
  - At the single system element level
  - At the overall system level
- A mix of «lagging» and «leading» indicators should be used
- Leading indicators are more focused on prevention and continuous improvement
- Lagging indicators confirm system is working but are not able to identify latent risk factors even when metrics are good; they allow to react only when something «bad» occurs
- Multi-year trends should be used for both look back and look forward

Questions / Comments ?

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Thanks for your attention !

Permissions