WORKSAFE

New Zealand Country Presentation

Ageing plant issues

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Today I'll cover:

1 **New Zealand Legislation**
2 **Incident summary**
3 **How used for inspections**
4 **Inspection agenda**

1 New Zealand Legislation

Major hazard facilities regulations

- Regulations came into force April 2016
- They require near miss reporting which, so far, are all of those received.
- Incident data has highlighted ageing plant issues

Note: New Zealand legislation does not cover land planning and environmental controls

NZ Industry – ageing issues

- Infrastructure typically old, but well maintained.
- Many ownership changes.
- Lack of regulatory oversight
  (except for pressure vessels and similar).
- Lack of experienced process safety personnel

Current regulatory status

- Regular inspections of major hazard facilities
- Focus on safety assessment
- No particular focus on ageing plant
- Inspectors taking enforcement action

2 Incident summary

26 August 2016– 18 February 2019

Incidents: 26 August 2016 – 18 February 2019

Follow MAHB criteria for analysis

192 total but we know of non-reporting

Mostly near misses or interesting for lessons learnt.

- 4 minor injuries.
- 6 instances of property damage.

Incidents involving ageing plant

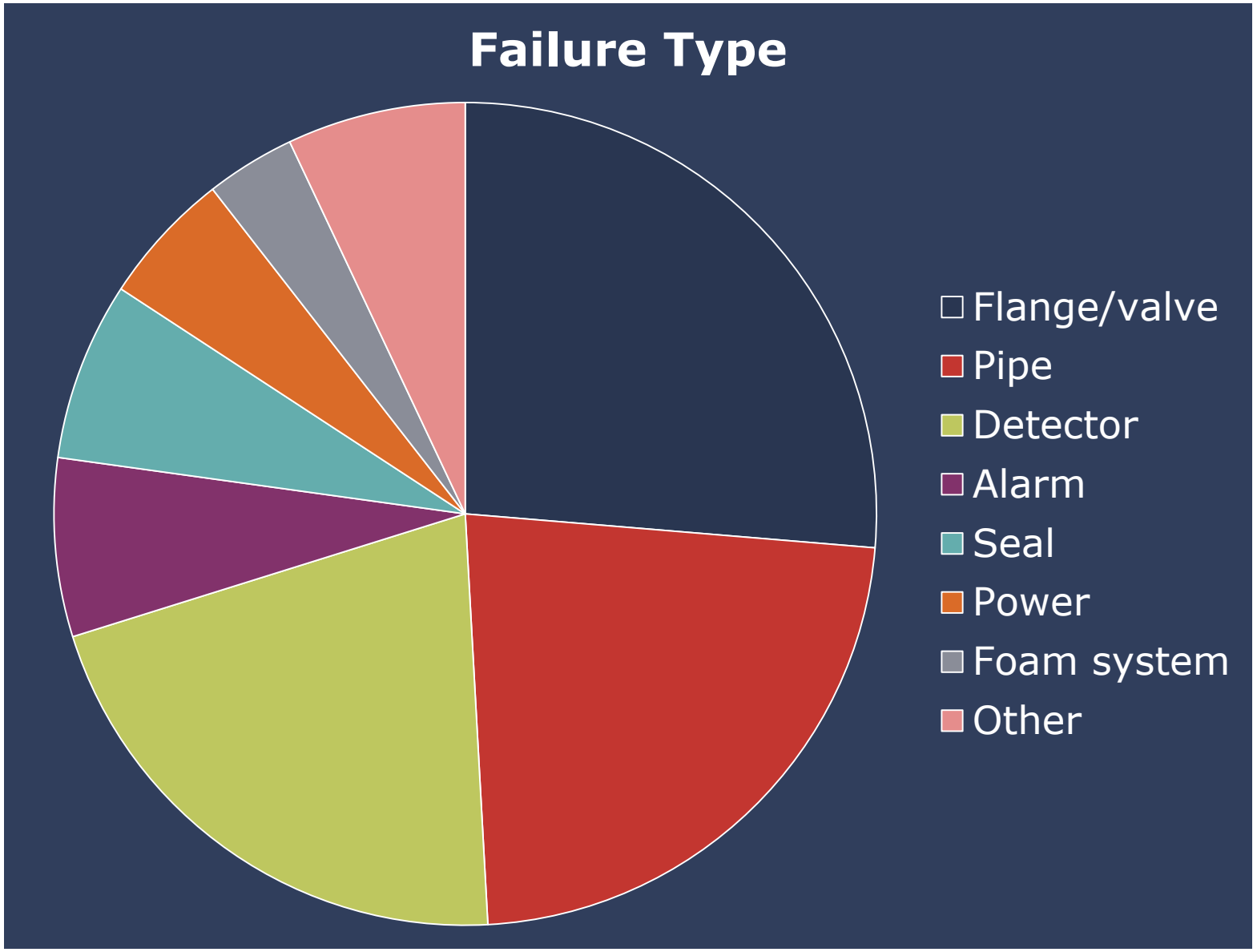
- 57 incidents due to ageing plant
- Differentiation between old plant and maintenance issues
- Categories on following slides

Hazardous Substance

Substance	Count
Chlorine	9
Petrol	9
Fire water	8
Hydrocarbons	8
LPG / butane	6
Natural gas	4
Other	12

Failure Type

Failure Type	Count
Flange/valve	15
Pipe	13
Detector	12
Alarm	4
Seal	4
Power	3
Foam system	2
Other	4


Failure Type
Flange/valve
Pipe
Detector
Alarm
Seal
Power
Foam system
Other

Underlying Cause

Cause	Count
Old plant	35
Maintenance	18
Unknown	4

3 Incident analyses in inspection planning

Data use in NZ inspections

- Currently priority is safety reports. Look at ageing plant issues in the safety report.
- Data has only been used relating to individual facilities.
- Currently analysing the data to give general guidance to inspections.
- Ageing plant is an identified inspection topic.
- Interested how incident data used in other inspectorates.

4 An inspection agenda

Particular facility problems

- Manufactures toxic gas
- Reported multiple incidents involving leaks
- Several investigations by inspectors
- Various enforcement actions taken

- 7 out of a total of 57 reported incidents involving ageing from this facility.

Example Incident

- Gas leaked into plant from cPVC 25mm pipe
- Pipe had cracked laterally
- Pipe 20+ years old
- Cause was chemical attack over long period of use.

Root causes

- Changes of ownership (foreign owners)
- Market prices and profitability low
- Contracted out maintenance (to save money)
- Company did not take responsibility for the maintenance
- Lack of replacement parts
- Management of change system not functional
- Lack of communication between operations and maintenance
- No awareness of ageing plant issues (and hence not addressed)
- No risk based inspection (RBI)
- No capital replacement programme

Initial inspectorate actions

- Improvement notices
  - Control of work procedures

- Directive letters
  - Non-functional or damaged equipment not fixed.

- 3-day inspection with two teams to review the systems related to maintenance and ageing plant

- Further 3-day inspection with one team to review operational control and interactions with maintenance.

Agenda Day 1

11:00	**Arrive offices**	**Discussion on arrangements for the inspection.**
12:00	Lunch	
12:30	Chemical plant tour	Familiarisation
14:30-16:00	Overview of asset integrity and maintenance systems	For inspectors to understand the system. Including responsibilities and liaison with Operations. New maintenance system. How this forms part of the safety management system.
16:00-16:30	Review of incidents	Those requiring maintenance actions.
16:30	Leave site	

Agenda Day 2 (concurrent sessions)

09:00	Arrive on site.	
09:15-15:00	Ageing plant mgmt. Asset integrity	Identification of risks and systems for managing this risk. Maintenance systems, including computer systems.
	Work programmes	Capital programmes. Maintenance funding. Safety assessment implementation.
09:15-10:30	Procurement	Purchasing and inventory control
10:30-12:00	Computer systems	For operational control. PLC; DCS; etc. How are they considered?
12-12:30	Lunch	
12:30-13:15	Standards	For equipment.
13:15-14:30	Quality control	Performance measures (KPIs). How are they used? Audit and review procedures.
14:30- 16:00	Inspection	Inspection regimes. For what? Frequency?
15:00-16:00	Electrical	Including power supply to site.
16:00	Close out meeting	Sum up the day
16:30	Leave site	

Agenda Day 3 (concurrent sessions)

09:00	**Arrive on site**	
09:15- 12:00	Safety critical elements	Identification and management. Independent verification.
	Management of change	MoC procedure and audit.
	Records	Maintenance records
09:15- 10:00	Control of work	Isolation and permits to work. Updates
10:00-12:00	Contractor management	Selection. Training and competency. All workers involved in maintenance.
TBC		Worker representatives from the contractors
12-12:30	Lunch	
12:30-13:30	Instrumentation	Calibration and maintenance.
12:30- 13:30	Contractor management	Continued
13:30-14:00	Complaint investigations.	
14:00-14:30	Inspector review	Inspector teams to prepare for close out discussions.
14:30-15:30	Review	Discussion and debrief with Facility Manager
15:30	Close out meeting	With all those involved in the inspection.
16:00	Leave site	

Notices issued resulting from inspection

Maintenance programmes:

1. Implement a maintenance programme using a risk gap analysis and risk based inspection approach.
2. Work instructions in SAP to be completed.

Ageing Plant:

3. Programmes to be developed for the inspection of all chemical plant equipment subject to ageing mechanisms.
4. Specific replacement programmes are required for all chemical plant equipment subject to ageing mechanisms.
5. A risk assessment is needed to justify the proposed timing of the current cPVC piping replacement programme.
6. A specific pipework integrity (inspection) programme, including bellows and other fittings, is to be in place for the chemical plant.

Notices issued for operational control (from a second inspection)

1. Plant operating envelopes and control systems
2. Operator training
3. Shift handover process
4. Completion of major accident control measures

Effectiveness

Year	Number of incidents (all incidents)	Comments
2016	3	9 months only. Reporting regime just started
2017	8	Increasing inspectorate effort
2018	3	Last incident July
2019	0	So far this year

QUESTIONS

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