The dashboard, a clearer view of what we do

You can't manage what you can't see

To align with our journey towards a generative safety culture we wanted to foster a culture of proactive risk management. To do that we needed to understand our Major Accident Hazards (MAHs), and have visibility of the health and strength of the risk control barriers we have in place to keep us safe from major hazards.

Although we'd used Bowtie diagrams to visualise each of our safety critical MAHs, and demonstrate how they're controlled, we couldn't easily measure or manage our process safety performance. Like others we relied too heavily on failure data to monitor performance and had no way of knowing how effective our risk control systems were.

So, one of the key things we implemented as part of OSIP (our Operational Safety Improvement Programme) was a Process Safety Management Dashboard, and its integration with core IT systems.

Making performance visible

The information we get from the dashboard is used at all levels of the organisation. At an Executive level, information from the dashboard enables us to establish company-wide governance around process safety (eg monthly summary reports support operational governance meetings) and provides assurance that major risks are being adequately controlled.

At a site level, in addition to providing early warning of dangerous deterioriation, planners and schedulers use the tool to manage and prioritise work based on its level of risk, and maintenance teams use it to assess the overall effectiveness of their maintenance management processes.

The dashboard continues to build with alarm data that allows us to highlight plant alarm status and the impact on our operators; management of change data that gives everyone visibility of the level of plant changes; and, staff competency assurance that monitors and shows that our people are given adequate opportunities to ensure that they are aware and training the the part they play in process safety at their site.

FEATURES

- Fully integrates with core IT systems.
- Near real-time view of the status of risk control barriers.
- Matrix view provides an overall health status for all sites.
- Ability to drill down into the status of each KPI.
- Cribsheets provide more detail for each KPI.

BENEFITS

- Provides visibility of the health and strength of your risk control barriers.
- Helps you avoid discovering weaknesses through costly incidents.
- Sites can prioritise actions to strengthen barriers before an incident occurs.
- Lets you assess the effectiveness of your maintenance, alarm management and competency processes.
- Helps foster a culture of proactive risk management.

Dual assurance

Through a set of comprehensive leading and lagging process safety mangement indicators, the dashboard provides dual assurance that our safety critical, MAHs are being adequately controlled. Leading indicators help us see whether our

Leading Indicators

Leading indicators provide a form of **active monitoring** and help us measure the effectiveness of the barriers we've got in place to prevent incidents (eg, maintenance plans and training). Each leading indicator has a defined target, a tolerance band and information on best practice. Leading indicators are also colour-coded to show the status of the KPI, as shown below:

- **Red:** significantly below requirement
- **Yellow:** below requirement
- **Green:** at or above requirement
- **Blue:** best practice performance
- **Grey:** inactive

Lagging Indicators

Lagging indicators are a form of **reactive monitoring** and measure actual process safety incidents. These incidents don't have to result in major damage or even a loss of containment. They can just show that there's been a failure of a significant control system which is designed to protect, or limit, the consequences of a major incident. They require investigation to discover weaknesses in system and are categorised by the severity of the incident, as shown below:

- **Square:** major process safety incident
- **Triangle:** significant process safety incident
- **Circle:** minor process safety incident
- **Cross:** no incidents
- **Rectangle:** inactive

What it means if a KPI's status is red

If a KPI is red it means that for some reason a target isn't being met. It doesn't necessarily mean that maintenance activities aren't being done. It could mean that:

- the system hasn't been updated with actual data, eg when a Work Order is closed out and we are unable to assure ourselves that the work is done
- the data being used has been wrongly categorised; or,
- the target is incorrect.

What's important is what the data is collectively telling us about the effectiveness of our maintenenace management processes.

How KPIs get calculated

Each night the dashboard extracts data from relevant sources and calculates results for each KPI.

What the dashboard looks like

The dashboard has a number of report views available, including:

Trending

Trending information is available to monitor improvement in KPIs, including a direct comparison of lagging indicators.

KPI Details

Crib Sheet	KPI Name	Value	Reporting Node	Risk Control Area	Metric Type	Target	Tolerance	Best Practice	Status	Actual	Weighted KPI	M-1	M-3	M-6	HSE Category	Comment Date
	CM Compliance	0 of 1	Te Rapa	Safety Critical Elements	>	60%	10%	80%		0%	0.5		N/C		Operational	Add
	PM Compliance	1 of 6	Te Rapa	Safety Critical Elements	>	85%	10%	95%		16.7%	0.5				Operational	Add
	Repeated Equipment Failures	3 of 8	Te Rapa	Safety Critical Elements	<	5%	2%	0%		37.5%	0.5				Operational	Add

Once you've selected a risk control area, you'll see a screen showing data for each KPI. You can assign specific users the ability to add comments, and all users can view comments.

KPI Transactional Drill Down

Show All entries Copy Print Download Search:

	PMORDER_RECORD_ID	ORDER_NUMBER_ID	ORDER_NUMBER_DESC	ORDER_GROUP	ORDER_TYPE	ORD_TYPE_DESC	FUNCTIONAL_LOCATION_ID
	All	All	All	All	All	All	All
1	67511	000200038254	INVESTIGATE GT MINIMAX SPURIOUS ALARM	CM	PMCR	CORRECTIVE MAINTENANCE ORDER	TRC10010SGJ01GH002
2	84206	000200038255	REPLACE CPU GT MINIMAX STANDING ALARM	CM	PMCR	CORRECTIVE MAINTENANCE ORDER	TRC10010SGJ01GH002
3	36343	000200038868	GT AC LUBE OIL PUMP 400V BREAKER - CHECK	CM	PMCR	CORRECTIVE MAINTENANCE ORDER	TRC10010MBV30AP002_-Q01
4	32802	000300005840	FAN FAULTED & C/O, SUSPECT BELT TENSION.	CM	PMEM	EMERGENCY MAINTENANCE ORDER	TRC10010SAU10AN001_KN01
5	36324	000200038233	INVESTIGAT GT FLAME DETECTOR 2 ALARM	CM	PMCR	CORRECTIVE MAINTENANCE ORDER	TRC10010MBM20CR007
6	36330	000200038602	REPLACE VALVE FLH-LCV-142A	CM	PMCR	CORRECTIVE MAINTENANCE ORDER	TRC10001HAD21AA142A
7	37028	000200038701	GT GENERATOR CB 52G DIFFICULT TO ENGAGE	CM	PMCR	CORRECTIVE MAINTENANCE ORDER	TRC10000BAC01GS004
8	80817	000200038330	REPLACE HRSG GANTRY CRANE	CM	PMCR	CORRECTIVE MAINTENANCE ORDER	TRC10000UHA

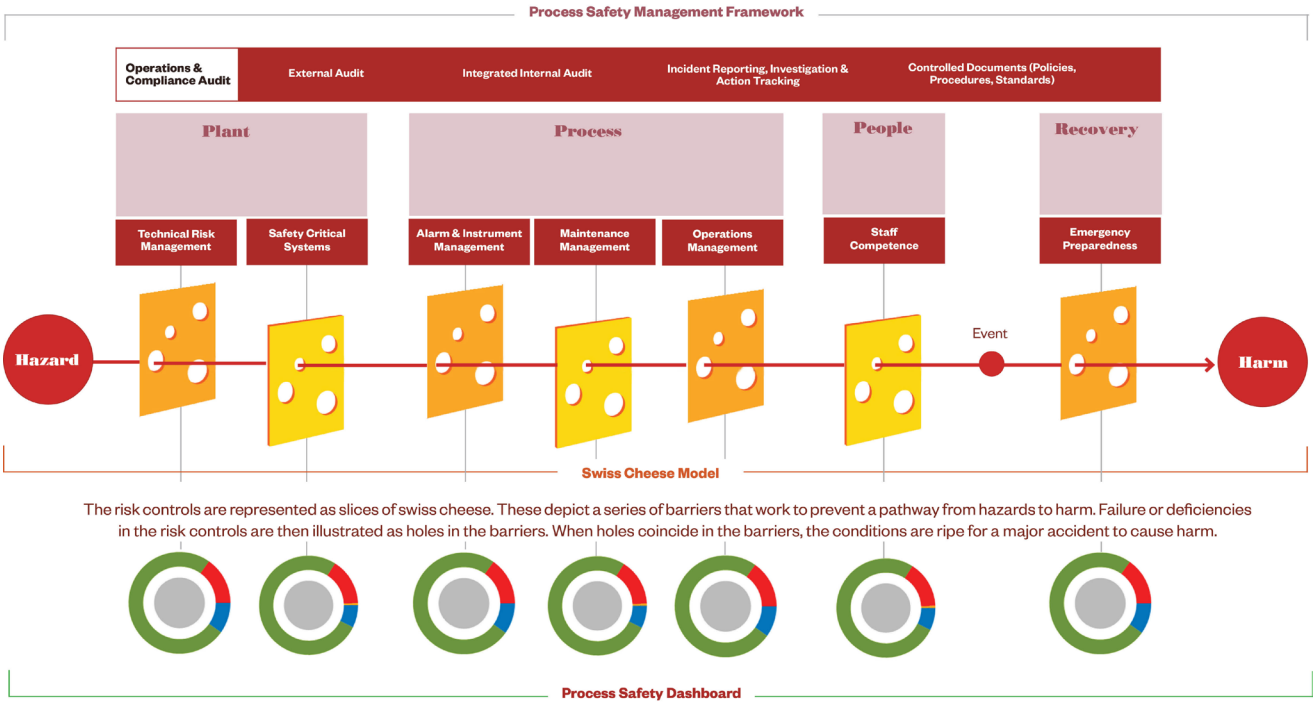
Drilling down into the KPI enables the source of issues to be identified and remedied.

How the dashboard fits with other systems

Individual KPIs are linked to the different risk control areas on our Process Safety Management Framework, which are in turn aligned to elements of a bowtie diagram (which are linked to hazards) that can be viewed for each site.

We find James Reason's 'Swiss Cheese Model' (1990) useful to help drive out lagging indicators and to illustrate what can happen when failures or deficiencies in the risk controls coincide (as show by the line from hazard to harm in the diagram below).

By placing the model between our Process Safety Management Framework, and the dashboard, we can see the importance of having the right information to ensure our risk controls are well managed.



The risk controls are represented as slices of swiss cheese. These depict a series of barriers that work to prevent a pathway from hazards to harm. Failure or deficiencies in the risk controls are then illustrated as holes in the barriers. When holes coincide in the barriers, the conditions are ripe for a major accident to cause harm.

The Process Safety Dashboard gives us visibility of the health and strength of the barriers/controls we have in place to keep us safe from major hazards. It's used to help measure and manage our process safety performance across each of the 7 risk control areas.

Looking for help to accelerate your process safety journey?

If you're looking to accelerate your process safety journey, we're here to help. Through our experience we can help you lead process safety transformation efficiently, provide expertise and guidance, provide transferrable processes and models, help you identify your approach to engagement and advise on technology to support sustainability.

Drop us an email, we'd love to hear from you: andy.sibley@contactenergy.co.nz