



# The Effectiveness of Human Factor Safety Initiatives at Lisheen Mine

- A Case Study -

All Island Safety Conference

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## Introduction

The Lisheen Mine was in operation from 1999 to 2015, when it closed due to depletion of resources. An ore extraction ratio of >95% was achieved.

The mine then went through a 'closure rehabilitation' process, which was completed in 2018.

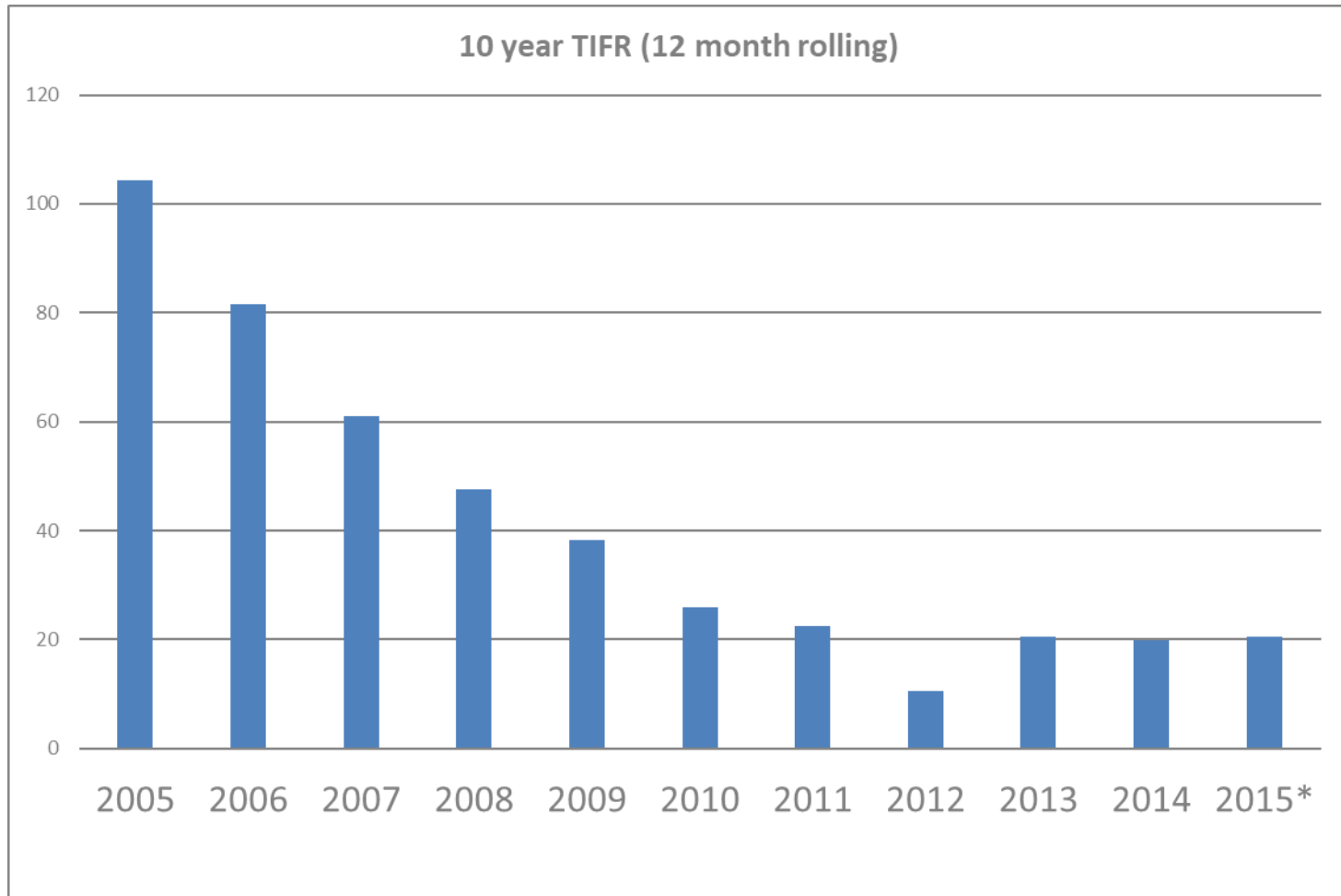
The site is now entering 'After Care' mode

In 2006, at a rate of approximately one Lost Time Injury per month and 80-100 total injuries per month, the Lisheen Management team implemented a programme of safety initiatives with a target of Zero Harm. The link between Total Injuries and Lost Time Injury Rate is well established through the Bird Triangle

This presentation covers some of the Human Factor Safety Initiatives, which were implemented and which we believed were of significant benefit in the journey to zero harm

# Safety Improvement Graph – Lisheen Mine

Total Injury Frequency Rate



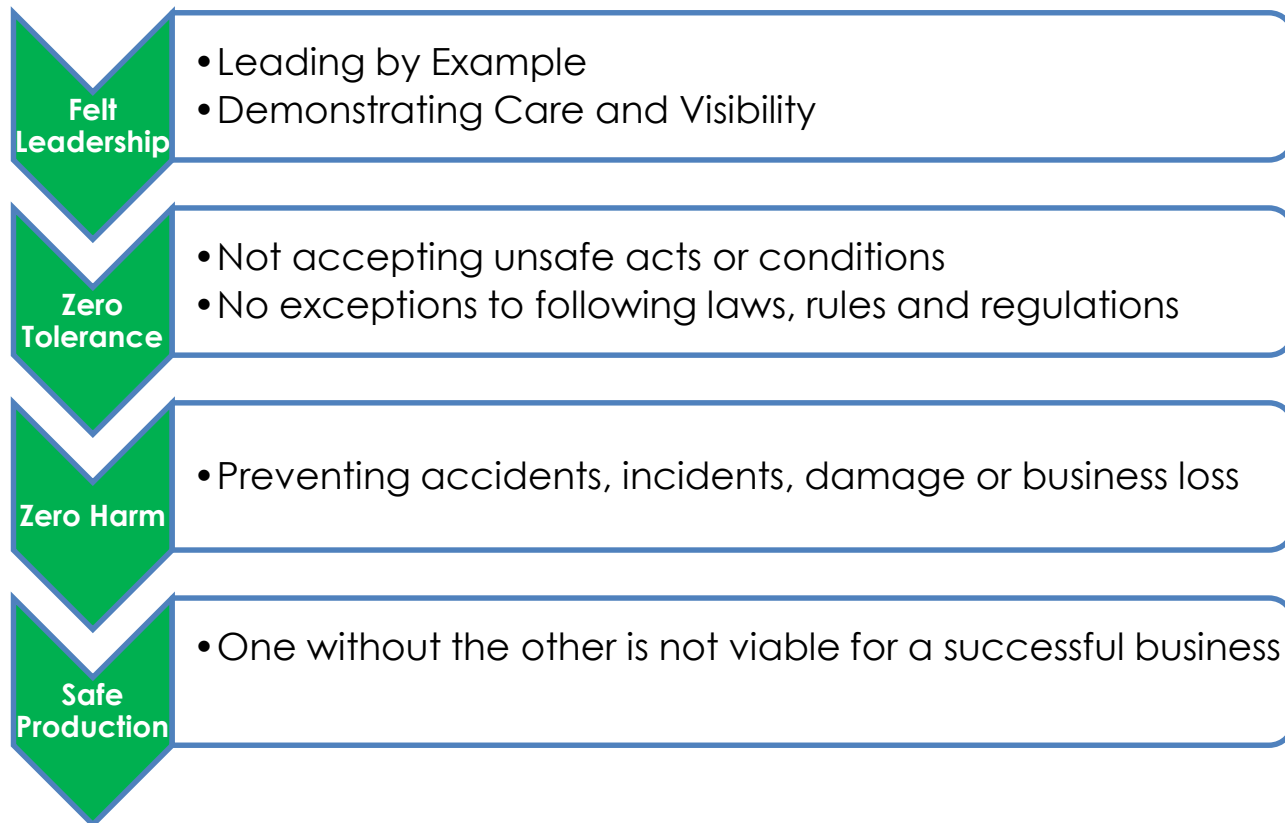
## Bird Triangle



## Visible Felt Leadership (VFL)

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Felt leadership is a public proclamation of an organization's commitment to caring about people



## Visible Felt Leadership (VFL)

VFL was introduced at Lisheen in 2005, when a team of managers were trained through the Dupont system in the process. Following a successful initial phase, the programme was rolled out in 2006. The programme continued until closure in 2015.

### Programme

- All Managers and Supervisors had targets for VFL safety visits
  - Senior Managers - 4 per month
  - Frontline Supervisors – 8 per month
  - Senior Staff (engineers, geologists, accountants, etc.) - 2 per month
- A standard format was followed, looking for both Satisfactory and Unsatisfactory findings
- Acknowledge and talk about good and bad observations that are identified
- Record findings – leading indicators
- Have a meaningful conversation with people about safety issues that you observe and listen to their issues on other safety issues
- No discussion on production

## Visible Felt Leadership (VFL)

### Statistics


- Publish statistics monthly
- Carry out quarterly blitz programmes based on statistics
  - Leading Indicators
  - Issues raised by employees
- Ensure that all stakeholders are participating

## Visible Felt Leadership (VFL)

### Results

- Many findings and trends identified - leading indicators
- After a slow start, employees engaged and they began to point out safety issues such as equipment and ground control issues. New ideas for safety were also suggested.
- Managers and Supervisors were obligated to fix the problems following discussions
- Employees expected feedback – important to ensure that this happened
- Positive safety discussions

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VFL Report - Appendix 2			
			
Date		Duration (Hrs)	
Start Time	End Time	Audit hours = No on Audit x Duration (Hrs)	
Area:		No People Observed	
Commendable Safe Actions Observed			
Major Learning Points for Action and Knowledge Sharing			
Team	Observation Notes (Include Corrective Action Taken)	Near Miss Please ✓	
Have you been briefed on the latest Fatality/Safety Alerts? If so, which ones?			
Follow-up Items		Assignee	Date Complete
Satisfactory	Issue	Unsatisfactory	Comments
	PPE		
	HOUSEKEEPING		
	CHEMICALS / REAGENTS / GAS		
	TRAFFIC MANAGEMENT		
	TMF- PONDS / RIVERS ETC		
	MANUAL & MECHANICAL HANDLING		
	PERMITS & ISOLATION		
	WORKING AT HEIGHTS		
	HOT WORK / ELECTRICAL		
	T-PEE / CONVEYORS		
	VENTILATION		
	ACCOUNTABILITY FOR AREA		
	WORK PRESSURE		
	TAKE 5		
	ACCESS / CONFINED SPACES		
	STORED ENERGY		
	CHANGE MANAGEMENT PROCESS		
	SCALING		
	RESTRICTED AREAS / BARRICADES		
	BACKFILL BARRICADES		
	OPERATING PROCEDURES		
	OTHER		
No of Satisfactory Acts =		No of Unsatisfactory Acts =	
Audit Index Calculation =	US or SA/audit hours		
Satisfactory Act Index =		Unsatisfactory Act Index =	
SIGNATURE			

# Planned Task Observation

## Planned Task Observations

A Planned Task Observation (PTO) is a process whereby a task is specifically observed to enable the observer to know whether or not a worker is performing all aspects of a specific task the correct way. It is a formal observation which is recorded in a manner sufficient for review following the observation.

Lisheen had a process of carrying out PTOs for Safe Operating Procedures (SOP).

All PTOs were developed from SOPs and as such the observations are very focussed.



## Planned Task Observations

The observee is informed prior to the PTO that he/she will be observed and as such can apply their full knowledge to the task.

Actions or conditions outside of the SOP are then identified

Following the PTO, the results are discussed between the observer and observee and the following can be carried out;

- Full compliance can be acknowledged
- Shortfalls can be rectified
- Changes to the SOP can be made based on discussions
- Leading Safety Indicators can be identified and recorded

The whole process was based on positive engagement between the observer and observee

Each supervisor had a target number of PTOs to carry out each month

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# Safety Improvement Rapid Action Teams

## Safety Improvement Rapid Action Teams

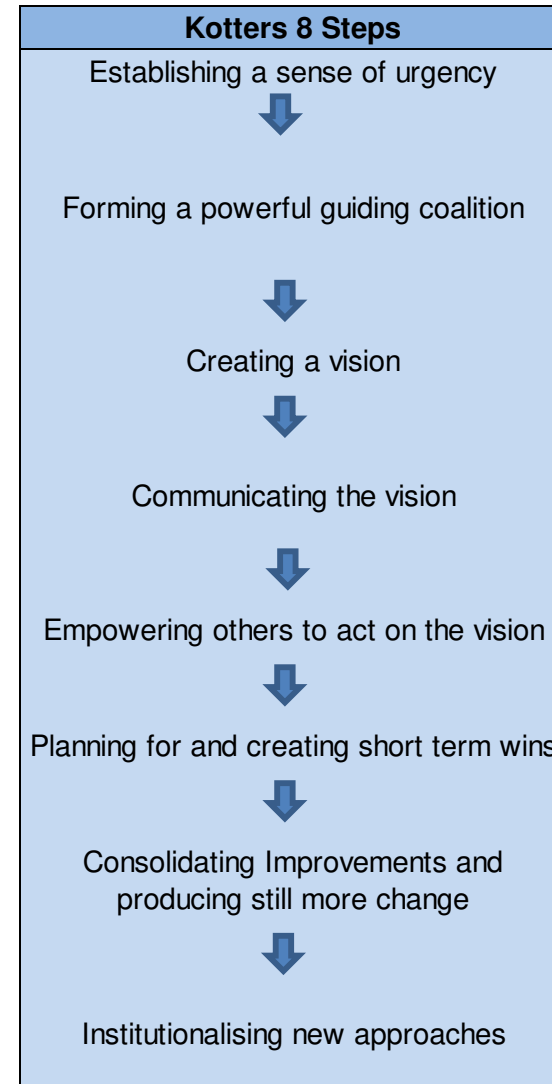
This process was started in 2008, with a format which had been used successfully at Anglo American operations, who were the owners of Lisheen at that time.

The concept was to introduce rapid action teams to make fast and effective changes in key areas that can effect safety

# Safety Improvement Rapid Action Teams

A professor at Harvard Business School and world-renowned change expert, Dr. John Kotter introduced his eight-step change process in his 1995 book, "[Leading Change.](#)"

**'Burning Platform'**  
For Change



## Safety Improvement Rapid Action Teams

The concept for each team was as follows:

1. Select a team leader, normally a mid- level manager/supervisor
2. Select a 'Godfather', from senior management, to whom the team report
3. Select a team made up of people from a vertical slice of operations; 8 to 10 people, good, bad and indifferent
4. Issue formal team invitations
5. Initial team meeting – 3 to 4 hours. Godfather present only at start and end of meeting, to set the scene and then hear the results of the meeting
6. Select topics for action from the group, which can have impact

## Safety Improvement Rapid Action Teams

7. Present to 'Godfather' at the end of the meeting
8. Agreement from Godfather to proceed on each topic – This automatically gives full support from the full management team
9. Set up structure for team: responsibility, measurement, reporting, etc.
10. Project length 8-12 weeks
11. Reporting – weekly on dedicated notice boards across the site
12. Meetings – weekly then biweekly
13. Objective is to complete all actions in the time frame
14. Summary when project is complete

## Safety Improvement Rapid Action Teams

Example of a topic chosen

Site wide housekeeping programme

- Identify key areas across the site and underground
- Train team members on assessment and scoring system
- Assess, photograph and apply a score to each site
- Agree timeline for improvement
- Re-assess, photograph and re-score each site
- Post results & photos on special Rapid Action Team Boards across the site

# Safety Improvement Rapid Action Teams

## Key Notes

- By using a vertical slice for team members, all employees felt they could contribute
- Using some 'less agreeable' employees, sometimes (but not always) changed their attitude, through a sense of inclusion
- Some topics were very successfully completed and others with less success
- The process eventually ran out of steam after a number of projects, but was re-ignited in 2011
- The process was considered to be a very good success

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### Kotters 8 Steps to Transforming an Organisation

Kotters 8 Steps	Lisheen Efficiency Teams	Comments
Establishing a sense of urgency ↓	Select the project which requires attention ↓	E.G. Safety Improvements in the Mine ↓
Forming a powerful guiding coalition ↓	Select people for the team using a vertical cross section of employees ↓	Example: Team Leader (mid-management / supervisor), Miner, Mechanic, Supervisor, Engineer, Accountant, Electrician, Purchasing. Godfather is selected from Senior Management, but is for initial approvals and guidance and does not attend the regular meetings ↓
Creating a vision ↓	Initial meeting to establish the specific target areas for change and make a plan for change ↓	Targets are selected solely by the team at the initial meeting ↓
Communicating the vision ↓	Brief the 'Godfather' and obtain approval for each item. Communicate the plan to all concerned ↓	Following the meeting, the Godfather is briefed on the target areas and if agreement is reached on each item, the project has the green light from all Senior Management and the authority to carry out the required actions ↓
Empowering others to act on the vision ↓	The 'Godfather' by agreeing to the action plan has empowered the team to act on them ↓	Green Light to start - some contentious areas need good interaction with area managers/supervisors ↓
Planning for and creating short term wins ↓	Maintain a tight schedule on the actions with weekly meetings. Keep all parties informed ↓	This requires a high initial level of activity and good commitment from the all team members ↓
Consolidating Improvements and producing still more change ↓	Embed the changes as they progress. The team has a significant level of power. Use sources of power when required ↓	Good communications on a weekly basis with updates on progress on all items (Notice Boards, Emails, Updates at production & Safety meetings, etc.) ↓
Institutionalising new approaches	At the end of the team life, ensure that the actions are followed through by having monthly meetings to discuss progress	At the end of the team life, ensure that the actions are followed through by having monthly meetings to discuss progress. May require change management, updated SOPs, PTOs, Tool Box Talks, etc.

# Drug and Alcohol Testing

## Drug and Alcohol Testing



We wanted to ensure that nobody worked on site or operated large equipment with alcohol or drugs in their system

## Drug and Alcohol Testing

- An alcohol testing policy was introduced at Lisheen in 2009
- The objective was to reduce the risk from people under the influence of alcohol
- The programme was discussed and agreed with all staff and unions – initially there was resistance and significant engagement was necessary
- A qualified person was hired to be present at random times at the entrance to the site, to carry out testing. (a retired Garda)
- All personnel, including visitors required to draw a ball – 1 in 5 chance for testing
- Very good success in early months – a small number of people identified, with low recidivism rates
- Later changed to test all people entering the site at all times
- Managers and Supervisors trained in understanding of blood alcohol levels and discussion with offenders

## Drug and Alcohol Testing

The system was as follows, based on a **legal alcohol limit of 0.8mg/l**:

**0.0** – Pass

**0.0 – 0.2 mg/l** – Stop, wait in carpark and return in one hour and re-check

**0.2 – 0.5 mg/l** – go home, return tomorrow, start with a discussion with supervisor

**>0.5mg/l** – taxi arranged to take home, return tomorrow, start with a discussion

Repeat offenders managed as required

Changed to test all people entering the site

Managers and Supervisors trained in understanding of blood alcohol and discussion

All contractors informed, but initially the compliance level was not as effective as the employees.

## Drug and Alcohol Testing

The alcohol testing system was extended to drug testing in 2014, but due to technical issues associated with the actual drug tests and their results, this part of the programme was never fully operational.

However, employees knew that they could be randomly tested for drugs from 2014 onwards. If time had allowed, this would have been implemented.

Without a doubt the alcohol testing was a huge success

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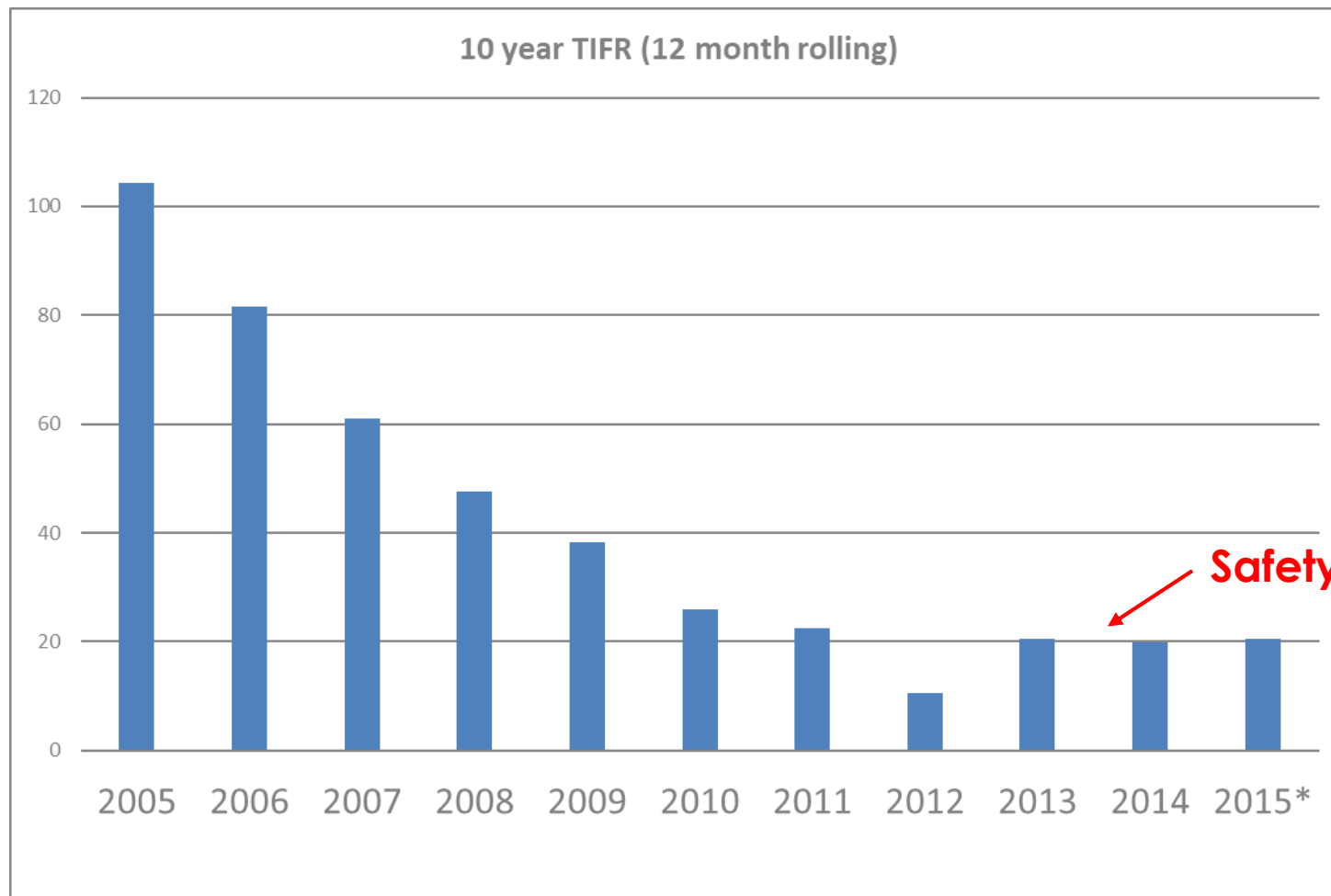
# Behaviour Based Systems

## Behaviour Based Systems

- As Mine closure approached Management recognised that employee morale and focus may be an issue.
- A climate survey was used to identify areas of concern.
- A bespoke programme was developed by Lisheen staff (Production and Safety professionals).
- The programme called 'Keys to Safety' or KTS.
- KTS included a refresher on risk assessment and controls but focused on behaviour:
  - Human cause of Errors (Slip / Lapse) – brain function.
  - Decision making in the workplace.
  - Reasons for working safely (not just compliance). Key 3
- ZIP - Zero Incidence Protocol – Senior and Middle Management trained

# Safety Improvement Graph – Lisheen Mine

Total Injury Frequency Rate



# Mine Rescue

## Mine Rescue

Mine Rescue is the Emergency Services of underground mining

Mine Rescue teams at all large mines in Ireland

At Lisheen - Two teams of six persons with substitutes for a total of 16.

- Highly trained in assessment and recovery services
- Teams made up of a variety of people – miners, tradesmen, engineers, etc.
- Trained to work under oxygen and in smoke filled conditions
- Trained to a high level on First Aid

## Mine Rescue



# MINE RESCUE



**16 trained members on 24-7  
callout**  
**Mutual Assistance arrangement in  
place with other mines & with Air  
Corps available for transport  
during an emergency**



**Ireland-UK Mine  
Rescue Competition  
Overall winners 2012  
2<sup>nd</sup> place 2013 &  
2014**

# Family Safety Expo

## Family Safety Expo

Lisheen Safety Expo – started in 2010

- Day 1 – Employees
- Day 2 – Family Day
  
- Garda demonstrations
  
- Fire demonstrations
  
- Childrens competitions
  
- Education centres – Health, Food, Sport
  
- Final year 1,500 people attended the family day

# LISHEEN SAFETY EXPO



## Other Human Factor Safety Initiatives at Lisheen

- Training and Retraining programmes
- Lisheen Integrated Safety and Health and Environmental Systems – **LISHEMS**
  - All supervisors had a LISHEMS Manual, specific to their position
  - Included all relevant SOPs, PTOs, PIs, with targets, etc.
- Planned Inspections
- Change Management Process
- Reward Innovative Ideas – Employees paid for good safety ideas
- Incident Investigation – Fixed timelines for each stage with full engagement of all involved plus non-related people – management, unions, safety reps, etc.

## Summary

Safety initiatives which included the input of employees were very successful

People at the 'coalface' often have the best solutions for their own safety and therefore need to be included at all levels of safety management

