worldsteel
ASSOCIATION

SAFETY AND HEALTH RECOGNITION PROGRAMME 2019

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The World Steel Association (worldsteel) is one of the largest and most dynamic industry associations in the world, with members in every major steel-producing country. worldsteel represents steel producers, national and regional steel industry associations, and steel research institutes. Members represent around 85% of global steel production.

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Safety and Health Recognition Programme 2019

Cover image: Gerdau

FOREWORD

"Nothing is more important than the safety and health of the people who work in the steel industry."

worldsteel Board of Directors

As our industry and the hazards we face continue to evolve, leading worldsteel members are developing new tools and techniques to proactively manage new and existing risks in the pursuit of zero harm.

worldsteel has been recognising excellence in the management of Safety and Health since 2008. Our first excellence recognition programme highlighted four member companies' Occupational Safety practices. This year we are recognising initiatives in six organisations including Occupational Safety but also spanning Occupational Health, Process Safety, and for the first time Safety Culture and Leadership.

Anyone can be a safety leader, from production workers influencing their peers, shift and plant managers coaching their teams, right through to the CEO, who has a unique and powerful opportunity to be a positive influence across the whole business.

In today's increasingly connected and virtual world, company leaders are more visible than ever. The importance of their roles in setting the standard for safe behaviours and practices has never been greater, and it was with this in mind that the new category was established.

I wish to congratulate Gerdau, Jindal Steel & Power Limited, Liberty Steel, Qatar Steel, Tata Steel Limited and Usiminas, and I hope their success proves an inspiration to others to emulate them.

Andrew Purvis
Director, Safety,
Health and Environment
World Steel Association

SIX SAFETY AND AND HEALTH PRINCIPLES FOR THE STEEL INDUSTRY

- All injuries and work-related illness can and must be prevented.
- Managers are responsible and accountable for safety and health performance.
- Employee engagement and training is essential.
- Working safely is a condition of employment.
- Excellence in safety and health drives excellent business results.
- Safety and health must be integrated into all business management processes.

FOUR FOCUS AREAS

Safety Culture and Leadership

Occupational Safety Management

Occupational Health Management

Process Safety Management

SAFETY CULTURE AND LEADERSHIP

QATAR STEEL

QATAR STEEL - QATAR

Visible Felt Leadership

Visible Felt Leadership is all about commitment and involvement of leadership in the management of Health Safety and Environment (HSE) in the plant. HSE is a focus point and a value at Qatar Steel, and no decision is considered or taken without first carrying out a risk assessment to determine the impact on the health and safety of people and plant, as well as the impact on the environment.

- The senior management team participate in weekly and bimonthly meetings to discuss HSE matters, listen to inputs from blue-collar workers, and make informed decisions.
- Various task teams have been established to address different high-risk areas, such as lock out / tag out, permit to work, confined space, working at heights, process safety, audit and review, and contractor safety.
- Leading HSE KPIs, such as management walks, safety observations, and attendance at HSE meetings are measured on a monthly basis, and also form part of the annual performance evaluations and related performance bonus scheme.
- The Qatar Steel Board Committee meeting covers HSE performance and strategy, and Board members conduct plant walkabouts to engage with staff about HSE.
- Regular and frequent plant visits by management and section heads ensure visibility in the plant, enable them to discuss HSE matters with staff and contractors, and to listen to staff and contractors' challenges and improvement suggestions.
- The first Qatar Steel Contractor Safety Forum was held recently, where MDs, CEOs, HSE professionals, etc. of contractors attended and networked with company line management and HSE personnel, ensuring alignment with the company objectives.

A Safety Observation Programme was implemented during June 2018, and Qatar Steel has been monitoring the implementation of the system on a weekly basis. The improvement achieved in less than one year is significant, with compliance levels reaching above 98%.

LTIFR for Qatar Steel and contractors combined showed an improvement of 85.2% between 2015 and 2018. The total number of injuries was reduced by 58% during the same period.

Although Qatar Steel realise that safety is not defined by the absence of incidents, the number of controls introduced and the level of commitment is substantial. Visible Felt Leadership is not about "boardroom talk", but "plant walk", and execution.

Management plant visit

Safety observation

OCCUPATIONAL SAFETY MANAGEMENT

LIBERTY STEEL

GERDAU - BRAZIL

Preventing Fatalities and Serious Injuries

Between November 2016 and October 2017, Gerdau went through a difficult period with several serious incidents occurring. These incidents were considered unacceptable by the company and led to the review and analysis of safety practices looking for potential gaps.

As a result, a dedicated group was set up to review the company's safety management practices and study the Potential Severe Injuries and Fatalities (PSIF) concept. The main observation was that the causes and correlations between Severe Injuries and Fatalities (SIFs) and less serious injuries are not the same.

According to the PSIF concept, injuries of differing severity have different underlying causes and reducing serious injuries requires a different strategy than reducing minor injuries. Cutting serious injuries requires consideration of all the precursor event data drawn from all available sources of data: accidents, injuries, near misses and exposures.

Gerdau has a mature culture of reporting safety events; these reports cover everything, from injuries at the top of the pyramid to the deviations at the bottom. All employees and contractors are encouraged to report and are recognised for doing so. All reported events are classified according to their potential severity.

Gerdau reviewed its existing safety management system, which is based on the Swiss Cheese Model, and complemented it with the new PSIF approach.

The new approach aims to identify PSIFs in all risk identification processes, including routine and non-routine safety tools, critical risk guidelines and external risk identification tools.

All these learning processes were condensed in a corporate action plan to prevent Severe Injuries and Fatalities and were deployed in the 10 countries where Gerdau has operations.

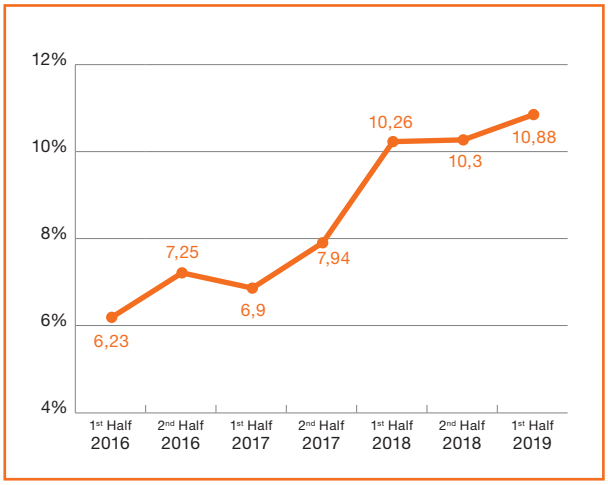
Plan for Severe Injuries and Fatalities (SIF) prevention:

- Step 1: Educate the organisation on the new approach
- Step 2: Work on the potentially serious and fatal events
- Step 3: Develop processes to identify precursors and recommend mitigation
- Step 4: Integrate mitigation efforts with the existing safety systems and audit

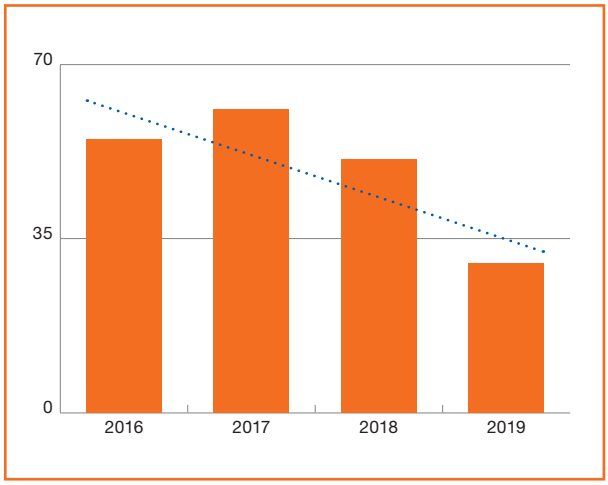
After implementing the PSIF concept, no fatalities occurred for more than 18 months (more than 150,000,000 man-hours worked), which is a record and an outstanding result in a company with more than 43,000 employees and contractors.

Gerdau strongly believes that a serious incident-free environment is possible, an essential and consistent step to a safe work environment.

Percentage of Potential Severe Injuries and Fatalities



Number of SIFs + LTIs with High Potential Severity



LIBERTY STEEL - AUSTRALIA

Hand Safety Headlight Team

Hand, wrist and finger injuries continue to be among the most prolific injuries in our industry. In the last 3 years, 85 injuries and near misses occurred in the Liberty Metalcentre business involving wrists, fingers and hands, ranging in severity from minor cuts and bruising, to significant lacerations and bone fractures requiring medical intervention.

A Hand Safety Headlight Team was formed in June 2017 to understand the key causes of hand injuries in our business and to identify reduction strategies.

The team brought together a diverse mix of employees based on the recognition that the business has significant variations of manual handling tasks and their associated risks across large, medium and small sites.

The Hand Safety Headlight Team encouraged all business leaders to get their employees thinking and working with their hands differently.

The Headlight Team's methodology was:

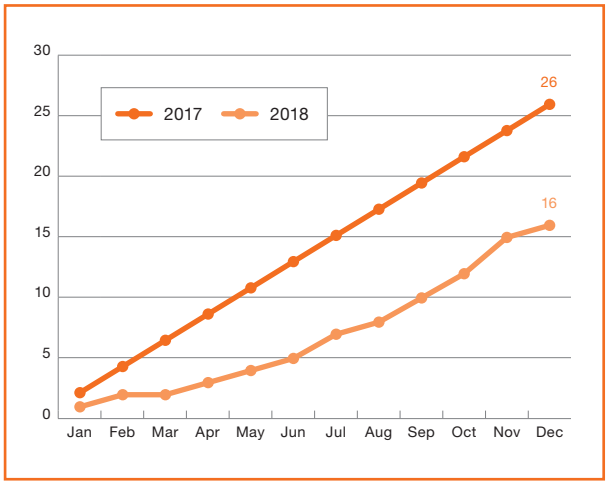
- Establish the brief and define the desired outcome: Identify strategies for improvement in hand safety within the business.
- Conduct a review of the previous 3 years of hand, wrist and finger injuries.
- Carry out surveys with a focus on staff, customers, contractors and truck drivers to better understand awareness around hand safety.
- Using information yielded from the data, design a programme to address data findings. An interactive programme was identified and developed to raise awareness regarding hand injuries. The interactive programme was in the form of a series of 'toolbox' meeting materials.

The toolboxes prepared by the Hand Safety Headlight Team over the course of 18 months were interactive and relevant to participants. Examples of activities devised in the toolboxes include hand print painting (software that identifies the number of times employees touched products daily), and a Hand Safety Observation Tool.

Other activities in the toolbox programme included challenging participants to button-up their shirt, tie shoe laces and secure trouser belts, all with one hand. These interactive tasks were all done with good humour, and with a high level of energy and participation. This was especially noticeable from the non-English speaking workforce.

Before the Hand Safety Headlight Team implemented this interactive programme, there had always been regular discussions about hand safety, but the messaging didn't seem to be getting the desired outcomes. The Hand Safety Headlight Team has had a significant effect on the reduction of hand injuries.

Hand injuries 2017/2018



Preventing hand injury: children activity

JINDAL STEEL & POWER LIMITED (JSPL) - INDIA

Safety Index - A catalyst for enhancing safety performance

Jindal Steel & Power Limited (JSPL) has recently introduced the Safety Index concept to enhance safety performance through engagement at every level of the organisation.

What is the Safety Index?

The Safety Index is a percentage unit used to objectively assess the safety performance of various departments within a particular unit: the higher the Safety Index, the better the safety performance. Every department is evaluated on a monthly basis using this index.

What is the basis of the Safety Index evaluation?

The Safety Index is evaluated based upon a set of both reactive and proactive parameters with equal weight.

Proactive parameters are assessed in each department by independent cross-functional audit teams consisting of senior leadership and line managers using a predefined checklist and rating system. Proactive parameters include effective functioning of safety committees, reporting of potential incident observations, compliance to standard operating procedures, safety training, statutory compliance, work permit system, accident reporting, and so on.

Reactive parameters include fatalities, lost time injuries; major fires, serious incidents interrupting production and major property damage.

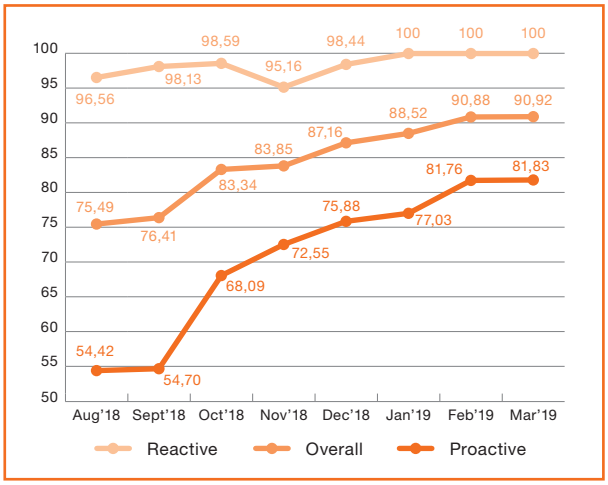
What impact has the Safety Index made on JSPL employees' mindset?

The Safety Index has created a competitive mindset among the employees from top to bottom. Every department head motivates their team to achieve the highest Safety Index, which in turn drives individuals to deliver their best safety performance. As a result, the safety culture of the organisation is evolving to the next level. The Safety Index has become a symbol of an objective and healthy inter-departmental safety competition across the JSPL Group. The Safety Index served as a catalyst to improve safety performance and enhance safety culture.

What has JSPL achieved through Safety Index?

The implementation of the Safety Index has brought a significant improvement in the overall safety performance. For example, no major accident has occurred in the last eight months, there has been a consistent growth in proactive parameters, increased engagement of each level of the organisation in safety matters, all-time high production and despatches, recognition at national and international forums, improved workforce morale, and improved worker-manager relationships. Also, a link between the Safety Index and the organisation's production incentive scheme has further enhanced the competitive environment in relation to safety.

Improvement trends in Safety Index performance



Employees recognised under the Safety Index scheme

OCCUPATIONAL HEALTH MANAGEMENT

USIMINAS

USIMINAS - BRAZIL

Usiminas Integrated Health System

The Usiminas Integrated Health System, known as SISU (Sistema Integrado de Saúde Usiminas), started in 2016 following an in-depth analysis of the company's conventional health system.

SISU is a health management model that covers four different areas: occupational health, health promotion and disease prevention, medical and dental healthcare and social welfare. A multidisciplinary health group was set up to guarantee that the system achieved the expected outcome. The objective of the group is to coordinate strategic health planning and to integrate these four areas into other company operations such as human resources, legal affairs, social communication and, above all, safety.

The list below describes some of the SISU deliverables:

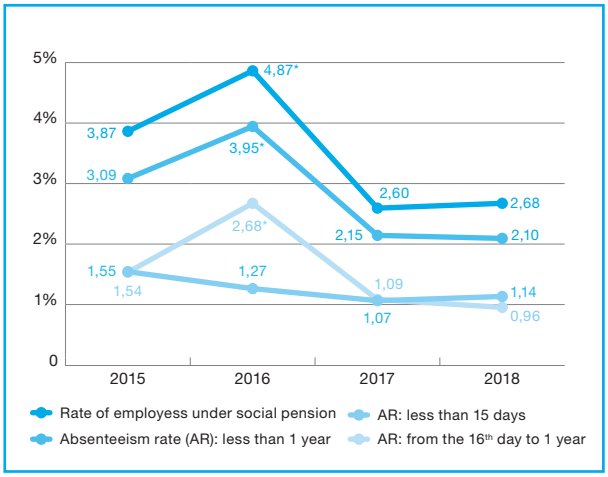
1. Unified Health Indicator System (UHIS): SISU uses UHIS, an employee risk scoring tool, which has a direct interface with occupational health, medical and dental healthcare, health promotion and disease prevention, and provides an integrated approach to the health of every worker during his/her yearly health checkup.
2. Health agenda: to act preventively, the group establishes a yearly health agenda with campaigns relating to seasonal disease profiles.
3. Health integration: health indicators are extensively analysed monthly by the group and from the analysis an action plan is established.
4. Guidance: priority deliverables are designed in line with the company's strategic vision.
5. Auditing: in order to improve and standardise the process, an internal cross audit process was established aiming at educational improvement.
6. Health in the operational area: all team members visit the operational area to enhance the interface between occupational health and operational departments.

During its implementation, the programme grew in importance and the positive results helped the group gain credibility among managers and employees.

The solutions implemented in the health process were based on scientific studies, strategic planning, and indicator analysis, and could be linked to productivity, employee satisfaction, cost reductions and other indirect benefits.

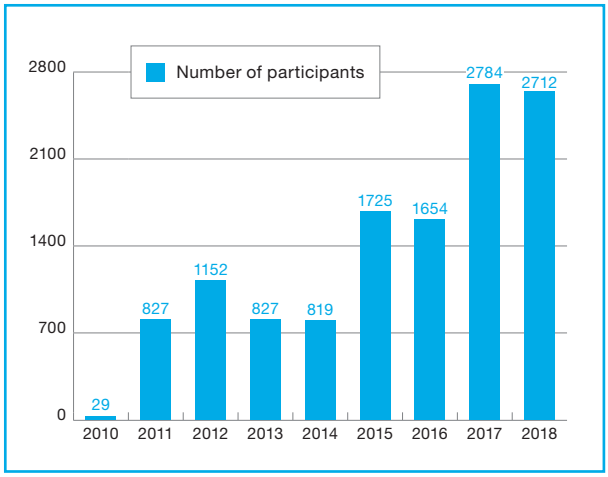
Currently, the health programme is systematically present in the operational area, not only because the company wants it but also because employees and managers are requesting it.

Impact on metrics



*(*In 2016 there was a headcount reduction, which explains the increase that year.)*

Evolution of subscribers




CENTRE OF EXCELLENCE
NAPTHALENE DISTILLATION PLANT
Caution
Mind your head
PSM CRITICAL EQPMT
NAPTHALENE DISTILLATION (IEM)
SL NO. | EQUIPMENT DESCRIPTION | SAP ID | TAG NO.
1 | Wash oil Temp controller Pre Heater outlet TC 2632 | 10209154 | 9 TIC 1001
2 | Wash oil Level controler Napthalene still LC 2317 | 10209155 | 9 LIC 1001
3 | Regenerator Level controller LC 2319 | 10209157 | 9 LIC 1003
4 | Condenser common vapour outlet temp controller TC 2638 | 10209156 | 9 TC 1004
5 | LP steam flow controller FCV 2104 | 10209158 | FCV- LPST-250-1016
6 | Wash oil Regenerator Temp controller TC 2643 | 10209159 | TCV-IPST-50-1015
7 | Napthalene still level transmitter LT 2317 | 10335163 | 9 LT 1001
8 | Differential pressure across Preheater | 10335164 | PDI2516
9 | Napthalene Still bottom temp Transmitter TT2635 | 10335165 | 9TI 1002
10 | Napthalene still Level control Valve LCV 2317 | 10335166 | LCV-LWO-50-1011
11 | Napthalene still Level control Valve LCV 2317A | 10335167 | LCV-LWO-50-1012
12 | Wash oillevel in Regenerator LIC 2319 | 10335168 | 9 LIC 1003
13 | Wash oil temp transmeter after preheater TT 2632 | 10335169 | 9 TT 1001
14 | Wash oil temp Control valve after preheater TT 2633 | 10335170 | TCV-IPST-40-1010
15 | Bypass of Temp control valve TCV 2632 | 10335171 | GLV-IPST-80-1694
16 | Condenser common vapour outlet temp Transmeter TT 2638 | 10335172 | 9 TT 1004
17 | Condenser common vapour outlet temp Transmeter TIC 2638 | 10335173 | 9 TIC 1004
18 | Condersar inlet & outlet pr. Diff. (water line) PDIT 2436 | 10335174 | 9 DPIT 1002
19 | LP steam Flow Transmeter FT 2104 | 10335175 | 9 FT 1001
20 | LP steam Flow Controller FT 2105 | 10335176 | 9 FIC 1001
21 | Wash oil regenerator Temp Transmeter TT2643 | 10335177 | 9 TT 1005
COE BPP

Managing Process Safety Critical Equipment

Excellence in Process Safety Risk Management has been identified as one of the six safety strategies for achieving the corporate objective of 'Zero Harm' at Tata Steel Limited.

The Process Safety Management framework is designed to probe the following three questions at all levels in the organisation:

- Do we know what can go wrong?
- Do we know what barriers we have to ensure that it doesn't go wrong?
- Do we know that our barriers are effective and working properly?

Different hazard identification and risk assessment tools are being used to address the first question. The other two questions are addressed by identifying and managing barriers, which can involve a set of critical tasks or a cluster of equipment known as Process Safety Critical Equipment (PSCE).

1. Process Safety Critical Equipment (PSCE)

PSCE is a critical component of the safety barrier and thereby ensures barrier effectiveness. The equipment is identified according to the following criteria:

1.1 Consequence based Process Safety Critical Equipment

Equipment whose failure may result in or contribute to an event that could lead to loss of primary containment of a hazardous substance. For example, a pressure transmitter.

1.2 Preventive and mitigative type Process Safety Critical Equipment

Equipment which prevents or mitigates the consequences of hazardous events that could result in fatality or major, irreversible health effects, significant property damage, or significant environmental impact. For example, a safety instrumented system.

1.3 Prescriptive type Process Safety Critical Equipment

Equipment which is prescribed as critical by regulators. For example, a pressure relief valve.

2. Tagging

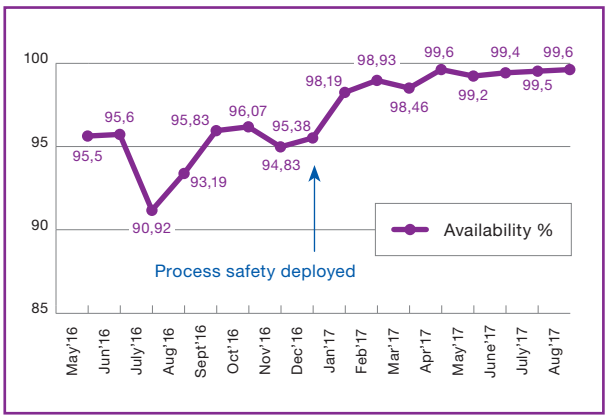
To facilitate the management and knowledge of all the departments involved in the life cycle of PSCE, all such equipment is identified using a unique tag (the letter "S" in the case of Tata Steel) in the SAP Enterprise Resource Planning software. Maintenance plans and actions are derived from Standard Maintenance Practices, which are based on what is known as "Recognised Generally Accepted Good Engineering Practices".

3. Management

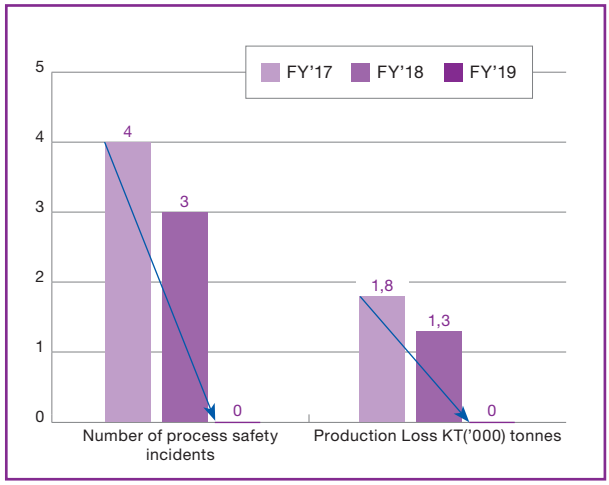
PSCE should be maintained effectively to ensure that all incidents are prevented and their consequences are mitigated effectively. SAP Plant Maintenance systems address maintenance procedures by prioritising inspection, maintenance and testing of PSCE and are performed in a timely manner, with the relevant history recorded and accessible. Any failure of a PSCE is highlighted in the reporting system.

Process Safety Management has brought about a cultural change in employees' perception of risk assessment, leading to fewer incidents, reduced production losses and the increased availability of equipment.

Availability of desulphurisation unit



Link between process safety incidents and production loss



2019 STEEL SAFETY DAY

Process Safety Incidents

APRIL 28 steelSafetyDay

Established in 2014, Steel Safety Day was set up to reinforce awareness of the five most common causes of safety incidents and to create a safer working environment across the entire global steel industry.

By focusing on the top five causes of serious safety incidents - moving machinery, working at heights, falling objects, on-site traffic, and process safety incidents, worldsteel intends to set up a continuous improvement process.

An extensive membership audit took place in advance of the Safety Day on 28 April 2019.

The focus this year was on process safety incidents.

IN 2019...

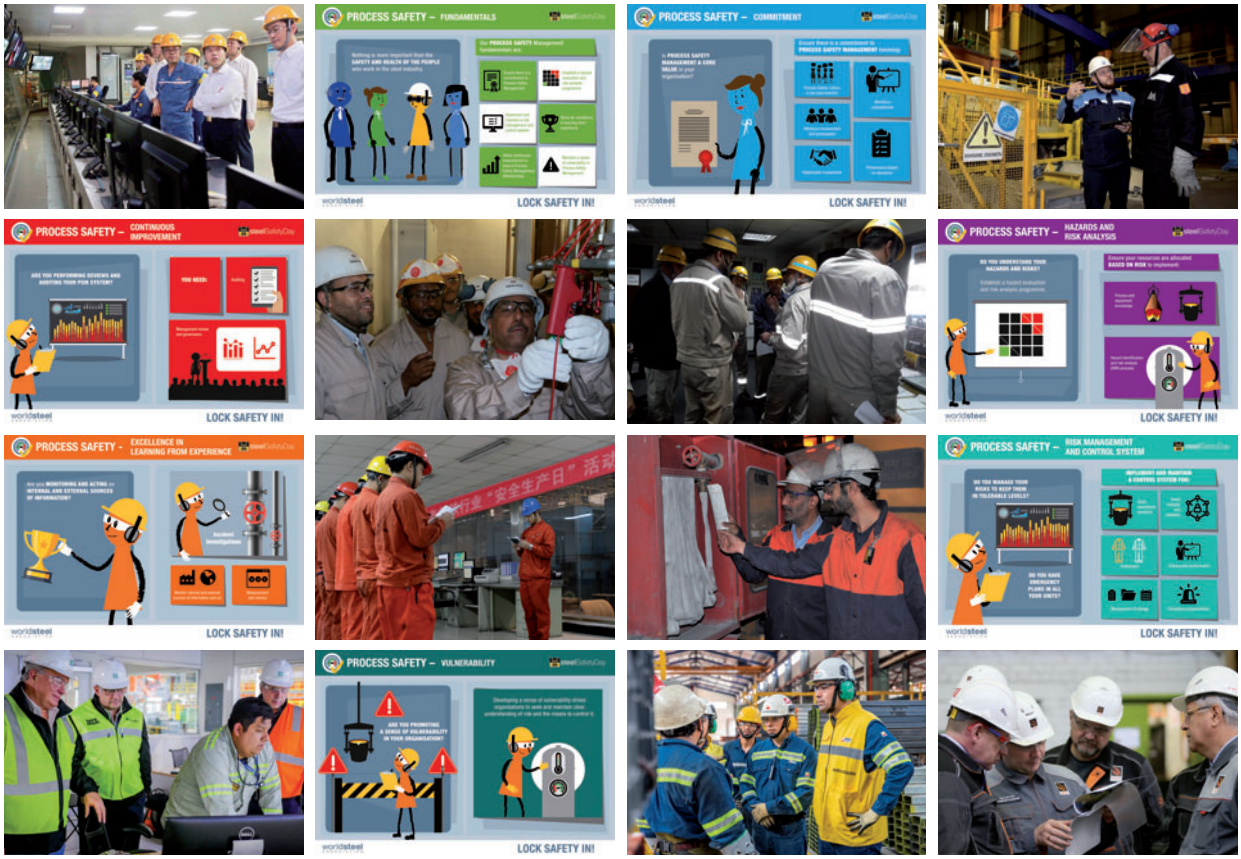
463,504 employees and contractors from 50 companies actively took part in the audit.

975,640 employees and contractors working on those sites were directly or indirectly involved in the audit.

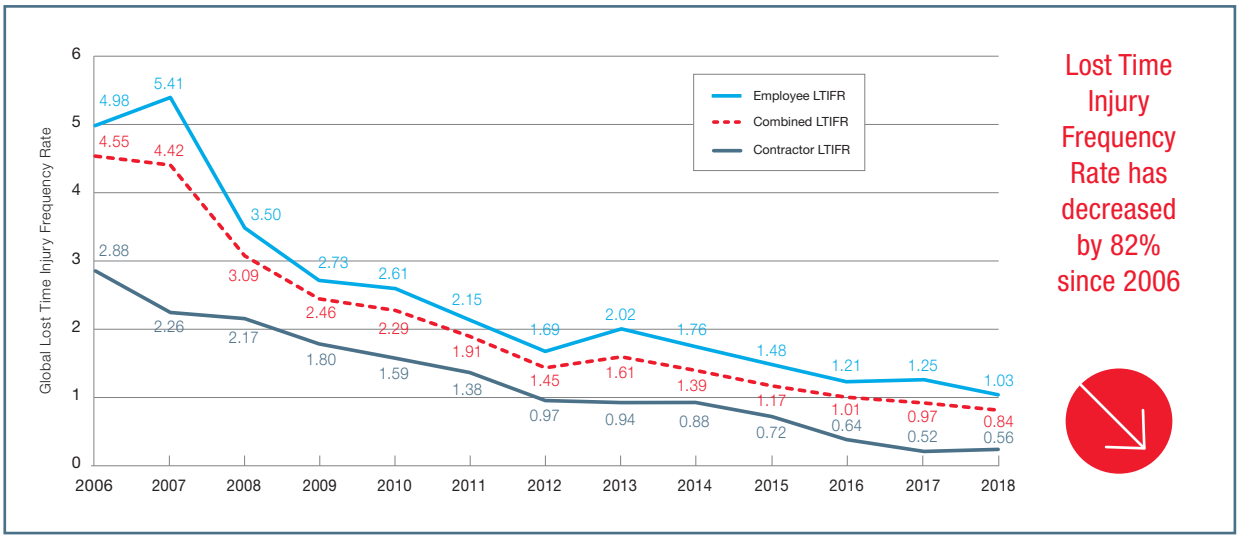
OUTCOME

The Steel Safety Day audits have had a major positive effect in identifying hazards in the workplace. Participating worldsteel members are now developing mitigation plans for 100% hazards identified to ensure serious injuries no longer occur.

For more information, go to the safety and health section of **worldsteel.org**, under steel by topic.



Steel industry Lost Time Injury Frequency Rate (LTIFR)*



**A Lost Time Injury (LTI) is an incident that causes an injury that prevents a person from returning to their next scheduled shift or work period. The Lost Time Injury Frequency Rate (LTIFR) is the number of Lost Time Injuries per million man-hours. LTIFR includes fatalities.*

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