



Safety and Health  
Excellence Recognition  
2022

A showcase of excellence  
in safety and health  
management practices  
from around the world

**More details on the recognitions included in this publication and the submissions received for the 2022 Safety and Health Excellence Recognition Programme are available on the worldsteel extranet.**

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.

## Foreword

The World Steel Association’s (worldsteel) members continue to go beyond when it comes to safety and health practices and initiatives. Our Excellence Recognition Programme aims to identify and highlight the most innovative and impactful practices. This year, worldsteel and the judging panel recognised a greater maturity in the submissions received, making the judging process especially challenging.

This greater maturity is in line with worldsteel’s vision to create and maintain safer and healthier workplaces. Recognised projects demonstrate:

1. Risk management and the application of defense-in-depth, a series of safeguards to keep hazards under control. There is evidence of a clear increase in the use of the hierarchy of control to prevent serious injuries, fatalities and catastrophic events.
2. Leadership and cultural transformation initiatives cascading from top to bottom, demonstrating a commitment to fundamental change.
3. A holistic approach to health covering traditional initiatives and the implementation of digital solutions and mental health improvement initiatives.



**Carlos Martínez**  
Head, Safety and Health

### Four categories and seven recognised companies:



**Safety culture  
and leadership**



**Occupational  
safety  
management**



**Occupational  
health  
management**



**Process safety  
management**





## Safety culture and leadership

Two recognitions

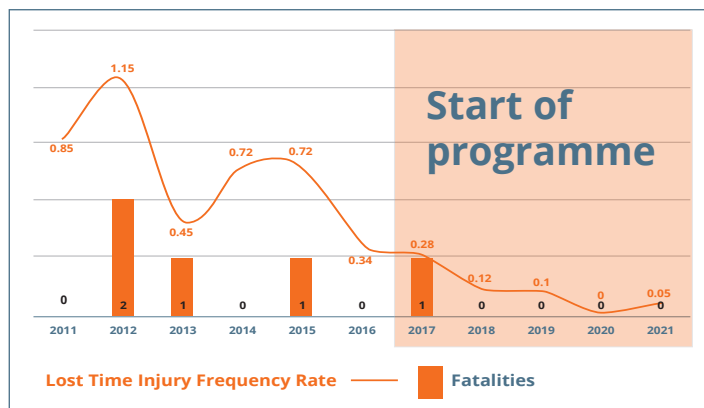
**ArcelorMittal** | A sustainable journey to zero accidents | Brazil

Initiated in 2017 after a fatality, ArcelorMittal Long Brazil needed to redirect the health and safety strategy by creating a robust Master Plan, aiming at cultural change, valorisation of life, and safety first in decision making, all of which would lead us to zero fatalities. This Master Plan was divided into four pillars: fatality prevention, risk management, visible and felt leadership, and health.



The following activities highlight each pillar that supports a vision of success in achieving zero fatalities in a sustainable manner and involved the entire hierarchy of the organisation:

- 1. Fatality prevention:** Governance system roll out covering workforce involvement, procedures, analysis, and management accountability.
- 2. Risk management:** Increased understanding and quality of existing risk management process, supported through a digital management system. A special technical group supported process safety management.
- 3. Visible and felt leadership:** Founded in the 'Take Care' programme, this pillar included activities and training at all levels. Ownership, broad involvement, and tangible results proved key elements of success.
- 4. Health:** Reactive and proactive interventions ensure a healthy workforce and quality of life.

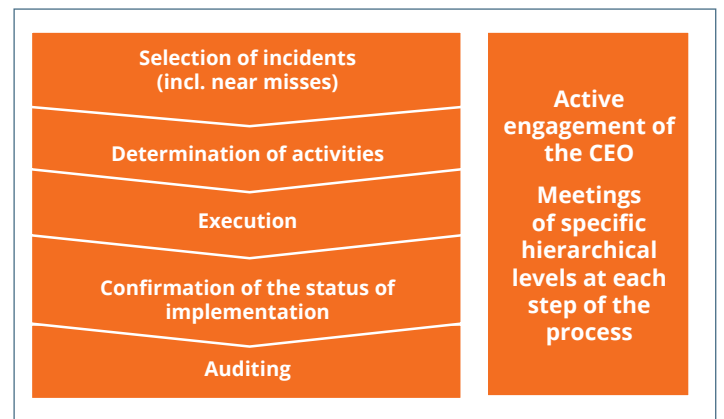


**JFE Steel** | Horizontal development to prevent similar accidents | Japan

The company-wide horizontal activities programme was initiated in 2020 to establish a systematic approach for preventing similar-type accidents across the company by leveraging learning from experience and effective implementation of safeguards.

The company CEO leads this programme with the support of top and middle management and the involvement of frontline workers. The approach consists of analysing and selecting accidents and near misses, determining horizontal developments, and executing or implementing controls. Audit activities follow this process. Horizontal development was established as a new leading KPI at JFE.

Through this programme, the CEO has more opportunities to communicate directly with the people working in the field and can have first hand knowledge of the strengths and improvement areas in the working sites.



To date, 17 out of 32 horizontal development activities completed,

57%

Lost Time Injuries (LTI) reduced from 30 to 10,

-67%

ArcelorMittal Long Brazil is a benchmark in 78% of operational corporate KPIs.

Lost time frequency rate improved from 0.28 in 2019 to 0.10 in 2021



# Occupational safety management

Two recognitions

## Emirates Steel | Enhancing crane operations and rigging safety | UAE

In 2018, Emirates Steel started implementing a comprehensive safety improvement programme focused on crane operations and rigging activities with the following key components:

- 1. Lifting operations governance:** Much effort and investment went into documenting rules for all onsite lifting activities leading to the development of new procedures, work instructions, checklists and lifting plans.
- 2. Competency enhancement:** Crane operators, riggers and lifting supervisors took classroom and practical training involving individual coaching, communication and awareness campaigns, toolbox talks, knowledge checks and quizzes.
- 3. Managing tools and equipment:** Several engineering solutions were implemented, such as limiting switches on all main crane hoists, installing interlocking systems for the crane operator at the entrance gates, and adding lifelines and handrails.
- 4. Auditing:** Third-party inspections are organised to ensure the safety of the lifting equipment, compliance with procedures, and clarification of the roles and responsibilities of the crane mechanical team and the end-users.

The project uses a risk-based approach, which refers to local and international standards.

Throughout the programme, the employees' active participation and involvement through suggestions, open discussions, and solutions at the shopfloor level were crucial to its success.



### Despite the COVID-19 interruption:

**1,333**  
operators trained  
in safe crane  
operations

**1,592**  
employees trained  
in rigging and  
slinging

**ZERO**  
injuries resulting  
from lifting  
operations in  
2019 - 2021

**73%**  
reduction in  
crane incidents  
from 2018  
to 2021

## U. S. Steel | Haul truck and loader tyre safety improvement | USA

U. S. Steel's Minnesota Ore Operations (MOO) consists of two open pit taconite mines that supply plants with iron ore pellets for use in the steelmaking process. Front-end loaders and 240-tonne haul trucks are used to transport crude ore to processing units. The tyres for these vehicles are approximately 3.5 metres tall and weigh around 4 tonnes.

Employees were performing routine job tasks near tyres that could be overheated, experiencing high/low air pressure, or defective to the point of instability. There have been significant incidents with these large tyres, including an employee that sustained fractures to his ankle and knee when a tyre exploded during boarding.

U. S. Steel identified the Michelin Earthmover Management System (MEMS 4) as a solution to putting employees in potentially hazardous situations. One of the most critical aspects of this system is that it allows employees to check tyre pressure and temperature from a remote location, ensuring a safer working environment. Internal sensors are mounted inside the tyres to provide real-time data to dashboards to ensure tyres are operating within specifications. Mine Control is alerted when tyres go into "CAUTION" or "ALERT" status and notify the operator to initiate proactive controls to prevent a failure.

This project, while being a significant safety improvement, has also increased performance and productivity. Since implementation, the number of tyres removed from service prematurely has dropped to zero. The average cost of a new 240T tyre is approximately US\$45,000, which translates into an approximate cost avoidance of almost US\$1,000,000 in the first year of implementation.



	Position	Temperature	Pressure	Prec		
	1	84 °C	118 psi	115 psi		
	2	84 °C	118 psi	114 psi		
	3	84 °C	118 psi	113 psi		
	4	84 °C	124 psi	114 psi		
	5	84 °C	118 psi	115 psi		
	6	84 °C	118 psi	113 psi		

**US\$1,000,000**  
saved in the first year of implementation



# Occupational health management

One recognition

Tata Steel | Wellness@Workplace

Programme | India

Tata Steel's innovative Wellness@Workplace Programme aims to improve and maintain employees' overall health and well-being through a unique organisation-wide platform, ensuring uniform rollout, monitoring and improvement. The concept focuses on four fundamental principles:

### 1. Identification and reduction of health risk:

**Industrial hygiene** - Identification and reduction of potential health risks or exposures to hazardous substances or environments: 34 control measures implemented.

**Workplace ergonomics** - Identification and reduction of ergonomics risk: 63 ergo-control measures implemented.

### 2. Improvement of workplace health:

**Periodic health screening** - Medical examination, including follow-up, treatment and counselling of high-risk cases: 70,000 employees and contractors examined.

**Physical well-being** - Physical fitness programme for employees and families with robust infrastructural support, such as gymnasiums, sports complexes, golf courses, adventure programmes, runathon etc.

**Health promotion** - Comprehensive preventive health awareness campaigns such as Doctor online, Doctor@doorstep, etc.: participation of 25,830 workers and contractors.

### 3. Improvement of mental health:

Identification of mental health issues and addressing them through primary, secondary and tertiary levels of intervention.

### 4. Effectiveness monitoring:

Monitoring effectiveness through major lagging indicators, such as Improvement of Health Index, number of high-risk cases, etc.



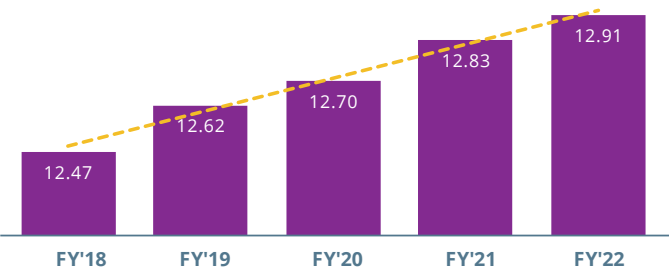
Reduction of lifestyle diseases

From 35.90% (FY'20) to 25.94% (FY'22)

Reduction in sickness absence rate

From 0.95 (FY'21) to 0.86 (FY'22)

Improvement in Health Index (Score out of 16)





## Process safety management

Two recognitions

### Hyundai Steel | Replacing high-risk tasks with quadruped robots | South Korea

Hyundai Steel's Dangjin Steelworks introduced the quadruped robot (SPOT) for the following purposes:

1. Prevent workers from being exposed to explosion risk and related accidents by using SPOT's remotely controlled arm to open and close an oxygen valve at risk of explosion.
2. Minimise the extent of damage or loss in an emergency, a fire or leakage of hazardous substances, by putting SPOT in the dangerous area immediately as a first action to check the ignition point (SPOT + IR Cam) or block a leaking valve (SPOT arm).
3. Replace workers during inspections of confined areas where there is a risk of hazardous atmospheres by checking potential abnormalities, such as measuring internal gas concentration (SPOT + Smart gas detector).
4. Perform daily inspection (SPOT + IR Cam) of hazardous facilities or equipment such as pressure gauge, thermometer, flowmeter value and heating part in motor etc.

Hyundai Steel's target is to make use of SPOT in 156 gas facilities and 2,927 locations in confined areas.



#### Delivering on Hyundai Steel's safety targets:

**ZERO**  
casualties during oxygen valve opening and closing

**Over 50%**  
reduction of damage or loss

**ZERO**  
risk for workers during inspection of a confined area

**Over 50%**  
workload reduced by replacing daily inspections

### POSCO Holdings | Smart Safety Ball | South Korea

Smart Safety Ball (SSB) is a new concept gas detector that checks the concentration of harmful gases inside confined spaces. By detecting the presence of gases in real-time, the ball helps to prevent accidents.

Leakage of harmful gases in an enclosed space can cause serious accidents. The SSB can be tossed into an enclosed area to detect the presence of gases before entry. Using a smartphone application, the concentration levels can be remotely monitored, helping notify workers about toxicity prior to entry.

Other devices have been developed to measure toxic gases, but the SSB is unique in that it can be tossed into any space, and the readings can be monitored remotely. Conventional detectors are typically attached to a worker's vest.

#### Features and benefits:

Only 60mm diameter, ~100g; with a reach of up to 100 metres

2 year battery life

3 gas types: O<sub>2</sub>, CO, H<sub>2</sub>S

Alert sent to all colleagues using the app

Bluetooth function eliminates blind spots

Upward-facing sensors

Waterproof

Auto-retrieve feature

Magnetic for targeted measurement

