



Safety and health recognition 2020

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

Table of contents

Foreword	3
2020 recognised companies Programme Scope	4-14
 Safety culture and leadership	4
Emirates Steel AMAN Safety Culture Transformation United Arab Emirates	5
POSCO The Safety Golden Bell Challenge South Korea	6
Tenaris Communication Routines worldwide	7
 Occupational safety management	8
Outokumpu Hands Are Not Tools Mexico	9
Gerdau Red Zones North America	10
 Occupational health management	11
Qatar Steel Company Heat Stress Programme Qatar	12
 Process safety management	13
Tata Steel Ltd. Digitalisation of Process Safety Performance Indicators India	14
Steel safety day 2020	15
• Focus areas	16
• Bowtie diagrams applied to process safety management	16
2020: A year marked by COVID-19	17
• worldsteel's reaction (timeline)	18
• COVID-19 measures in the workplace	19

Foreword

Within every organisation, it is almost certain that 2020 will be remembered as a singular year, in which many plans and expectations were derailed by the tsunami of the global COVID-19 pandemic.

At the time of writing the world looks a very different place to the one we might have expected to see as we began our journey into this new decade. Employers, employees and contractors have faced massive disruptions, facing confinement in their homes, homeschooling children, high uncertainty and in some cases facing the tragic loss of loved ones before their time.

It is in this context that steelmakers are currently operating, with legion new COVID-19 related controls in place to reduce infection risks. However, virus or no virus, unsafe acts, unsafe conditions and risks still exist, and it is absolutely critical that at this time of maximum distraction leaders combine virus critical controls while maintaining their focus on safety and health.

It will be strong and visible leadership on the shop floor that will make the difference. Physical and social distancing must be maintained, but in terms of their communication and accessibility leaders need to be closer to workers than ever before.

Working in the steel industry is safer than ever, and we can maintain and build on this improvement. We will do this, in part, through supporting and learning from each other, and it is for this reason that worldsteel launched our safety and health excellence recognition programme in 2008.

The organisations recognised in this brochure represent the best, most impactful, and transferrable initiatives submitted to worldsteel.

I offer my sincere congratulations to **Emirates Steel, Gerdau, Outokumpu, POSCO, Qatar Steel, Tata Steel** and **Tenaris** for their success and I am delighted to share their innovations with you here.

Andrew Purvis

Director | Safety, Environment and Technology
World Steel Association

“It is absolutely critical that at this time of maximum distraction, leaders combine virus critical controls while maintaining their focus on safety and health.”

In 2020, COVID-19 affected all areas of safety and health:



Safety culture and leadership



Occupational safety management



Occupational health management



Process safety management

Safety culture and leadership



2020
Recognised
Companies:

Emirates Steel
POSCO
Tenaris

Emirates Steel | AMAN Safety Culture Transformation | United Arab Emirates

Over the past few years, Emirates Steel has made substantial improvements in its approach to safety, reaching a Lost Time Injury Rate of 0.53. However, safety performance hit a plateau in 2015-2017, and it became clear that a targeted effort was required to make a step change in safety culture.

The AMAN (meaning “safety/security” in Arabic) Safety Culture Transformation project introduced several crucial safety management processes aimed at moving the organisation along the Bradley curve to ultimately reach the interdependent level of safety culture development.



Visible Felt Leadership

The practice of safety walkabouts by executives and managers was expanded and enhanced with more than **70 coaching sessions** aiming at increasing the efficiency of management in their safety observations and interactions with shop floor personnel.

New HSE governance and performance programme

Health, Safety and Environment (HSE) monthly performance review meetings were established at three levels of the organisation: company level chaired by the Chief Executive Officer (CEO), function level chaired by the Chief Operating Officer (COO) and Vice Presidents (VPs) and departmental level chaired by the department managers. A standard safety dashboard was introduced to capture leading and lagging KPIs and facilitate effective performance discussions.



HSE principles, life-saving rules and reward and recognition process

HSE principles and life-saving rules were widely publicised, including a full-day interactive workshop delivered to more than 2,500 employees from all levels of the organisation. A reward and recognition procedure was launched that outlined the criteria and recognition process for contribution to the company's safety effort as well as disciplinary actions to be taken for any violation of the life-saving rules

Integrating safety into everyday operations processes

A large part of the change process was around ‘transformation areas’- each plant went through a ‘transformation’ - gradually working on integrating safety into all the processes of everyday operational management.

Digitalisation strategy for improved safety performance

A specialised IT platform was implemented to manage HSE critical processes more efficiently via a series of modules, including, HSE observation and inspection, action tracking, meetings, incident reporting and investigation, and dashboard reports.

Achievements

In 2017, the safety culture maturity assessment placed most of the organisation in the Dependent stage and about a third in the Reactive stage of safety culture development. During a reassessment conducted in October 2019, a step change was identified and half of the organisation was placed in the Dependent stage and another half in the Independent stage.



75%

reduction of
LTI frequency rate
in the last 6 years



168%

increase in near-
miss reports in the
last 3 years

POSCO | The Safety Golden Bell Challenge | South Korea



The Safety Golden Bell Challenge is a survival quiz game on safety knowledge - an idea borrowed from a Korean TV quiz show - that was initiated to change the perception of safety by encouraging all employees (including contractors) to proactively communicate and participate in creating a 'positive safety culture' under the leadership of top management.

The production staff (14,172 POSCO employees and 16,353 contractors) participated in a series of safety quiz competitions over a three-month period. The programme was launched at the start of August, with participants given two months to study and prepare.

Voluntary groups were organised to study materials that were prepared in advance before a first round of quizzes were held in each department in early October to select qualifying representatives in proportion to the number of persons in the organisation. The final match was held in late October and involved 400 contestants. In the end 10 final winners were rewarded.

Timeline:

- Launch (1 Aug)
- Self-study (1 Aug - 30 Sep)
- Preliminary match (1 Oct - 15 Oct)
- Final match (25 Oct)

The final consisted of an opening ceremony, a consolation quiz, and a quiz to test top management's safety general knowledge and awareness. The final questions were based on the self-study materials, were in different formats (e.g., true/false, short answer, multiple choice) and classified into three difficulty levels (i.e., hard, medium, easy).

Led by the top management, the quiz attracted the interest of many employees and contributed to a high level of voluntary participation. As a result, over the course of the competition POSCO's safety metrics and safety maturity significantly improved.

The number of identified potential hazards greatly increased (from 8,908 to 17,648 cases), and employee participation in safety activities (e.g., education, training, patrol, inspection) increased by 105% with a notable increase in the active participation of younger employees (in their 20s and 30s).

Furthermore, there was an increase in the number of employees achieving the safety-related national technical qualification. The safety maturity level that was measured with the POSCO Safety Rating System (or PSRS, POSCO's own safety culture diagnostic tool based on the Bradley curve) increased from Dependent level to Independent level, and finally, the number of employees' unsafe behaviour cases decreased by 5.7%.



98%

increase in the identification of potential hazards



105%

increase in safety activity participation



12%

reduction in cases of non-compliance with work procedures



5.7%

decrease in unsafe behaviour

Tenaris | Communication Routines | worldwide

The objective of the Tenaris Communication Routines programme was to set up a systematic, prepared and structured face-to-face communication process. Through effective communication channels, starting from the plant director/manager, the aim was to reach every employee at all levels of the organisation, with a strong focus on the shift leader's role. The purpose of the initiative was to share information to improve safety awareness, knowledge and behaviour, as well as to increase personnel engagement and instill a sense of purpose.

The programme, designed by the local Communication department, was reviewed and strongly supported by local plant directors and managers. It received the backing of the EU President, the Chief Industrial Officer (CIO) and the Corporate Health & Safety department, who fully endorsed the launch of the project at a global level. Communications representatives in the different regions were then tasked with deploying the programme worldwide

The main contents of the Communication Routines comprise:

- Accidents and/or incidents that occurred in the sector in the previous week; cause, corrective actions
- Accidents and/or incidents that occurred in other sectors or mills, that are relevant to share, given their severity or similarity with the activities performed in that sector
- Changes in work instructions (Tenaris Safe Systems of Work) or risk analysis
- Quality/environmental/efficiency information
- Short Q&A session

The methodology for the programme's implementation included:

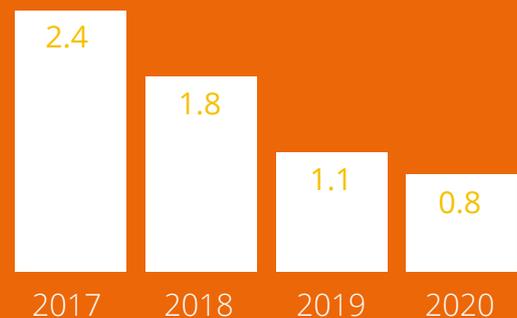
- Definition of dedicated guidelines, clarifying project goals, methodology, audiences targeted, people responsible, etc.
- Elaboration and setting up of dedicated training for shift leaders and supervisors in communication skills and leadership communication
- Assessment of talking points
- Establish communication routines tracking systems and one-to-one coaching/feedback follow ups
- Production of dedicated content (videos, safety updates, etc.) to support communication routines delivery and company harmonisation
- Integration of "communication routine delivery" in the annual formal evaluation process of shift leaders, with a dedicated description in the evaluation form
- Integration of communication assessment/ coaching in the shift leaders' or managers' annual development plan

- Follow up (and bottom up) survey for employees, to measure the level of knowledge, deployment and effectiveness of the communication routines process
- Promotion of the activity on a regular basis, (magazine, video, billboards, etc.) in order to keep the focus on the practice and further consolidate it.

The practice has had a positive impact on lagging safety metrics:



LTIFR by calendar year



Occupational safety management





2020
Recognised
Companies:
**Outokumpu
Gerdau**

Outokumpu | Hands are not tools | Mexico

In the past
61%
of total injuries related to the hands and fingers

First aid hand injuries:
17 in 2017
VS
2 in 2019



Across Outokumpu, everything starts with safety, as the safety of all employees is the first priority, every shift, every day.

Following a company-wide analysis of accident trends over a multi-year period, it became apparent that injuries to hands and fingers accounted for the highest number of accidents (61% of the total). This data prompted the safety and management teams of Outokumpu's Mexinox mill to act.

With the goal of a zero-injury workplace and the understanding that a team of approximately 1,000 tends to have different opinions and attitudes towards safety, a very practical and personal campaign was implemented.

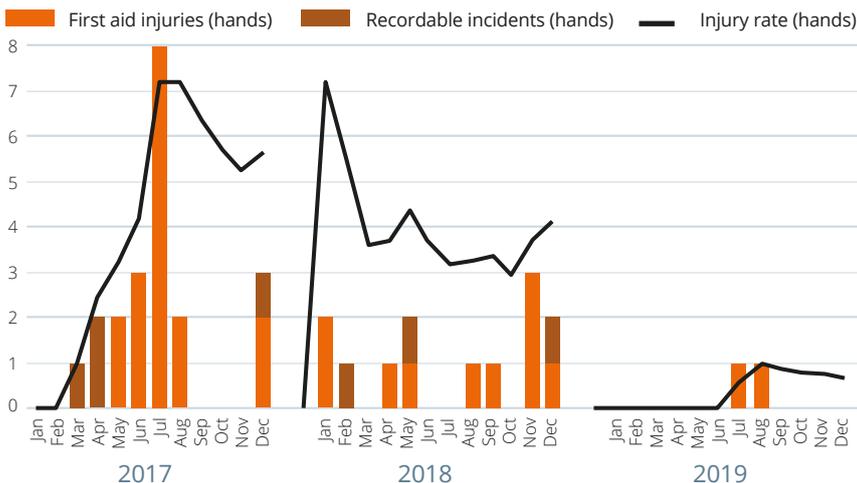
In 2017, the Hands Are Not Tools campaign was executed to further identify any potential hand safety risks. The management team led mandatory safety walks, daily discussions and safety behavior observations across all shifts. While the support from the management team was felt throughout the organisation, the groundswell and success of the campaign really happened on the operations floor.

The implementation of SafeStart® and the personal ownership this programme places on one's own safety helped the organisation to embrace and fully understand that safety comes first, always. This encouraged a culture of enhanced accountability and motivation across the team. This culture shift was further supported by visual reminders placed throughout the mill of how a hand injury could affect the team's lives – and the lives of their families.

Posters depicting simple tasks like buttoning a shirt with missing fingers or hand were placed throughout the mill. At the annual Family Safety Day event, family members imprinted their painted handprints on large banners and included a quote about how hands and family life intersect. These posters are hung across the facility and have proven to be an important reminder that someone is waiting for them to arrive home safely.

Following three years of focused efforts, the Mexinox team reached their goal of zero finger and hand injuries and reduced first aid hand injuries from 17 in 2017 to 2 in 2019 and has contributed to Outokumpu's goal of a zero-injury workplace.

Hand injuries



Gerdau | Red Zones | North America

Potential Significant Injury & Fatality (PSIF) incidents involving molten metal are of particular concern in the melt shop. Over the past few years, Gerdau experienced several incidents and near misses involving molten metal.

In 2014, a fatality occurred, which led Gerdau to refocus its efforts and attention on the molten metal route in its entirety and on the twenty critical items impacting safety. The 'Gerdau Molten Metal Pathway' focuses on guidelines establishing

baseline safety requirements for people, processes, and equipment.

However, several significant PSIF incidents in 2019 highlighted the fact that not enough was being done and led Gerdau to implement new 'Red Zone Practices'. Red Zones are areas where potential exposure to molten metal and people is highest and include areas around the EAF and casting.

The Red Zone safety practices include:

1. Red Zone areas identification in all North America melt shops
2. Introduction of administrative and guarding controls in melt shops
3. Mandatory specific PPE in red zone areas

<ol style="list-style-type: none"> 1. Undershirt: base layer 2. Uniform shirt 3. Uniform pants 4. Quantum jacket 5. Face shield 6. Snood (green or blue) or hood (black or white) 7. Quantum or aluminized leggings 	<ol style="list-style-type: none"> 8. Gloves 9. Hard hat with chin strap 10. Safety glasses 11. Earplugs 12. Metatarsal shoes 13. No jewellery (no rings (plastic, rubber or metal), bracelets/fitbits, necklaces, etc.)
--	--
4. Implementation of operational and emergency procedures

Examples of operational and emergency procedures implemented include:

- Completing a pre-start checklist to ensure safety and operational systems and parameters are correct for startup;
- Clearing teammates from the EAF floor and deck when scrap is charged;
- Prohibiting taking manual temperatures or samples through the EAF slag door;
- Prohibiting the addition of alloys to ladles until at least 25% molten steel volume is in the ladle;
- Establishing maximum scrap charge height in the furnace to prevent roof water panel damage;
- Using video cameras to inspect EAF refractory after each heat;
- Not allowing water to accumulate in pits;
- Water in the EAF, ladle/tundish loss of containment (burn through) and caster breakout emergency procedures;
- Unique water in the EAF and ladle/tundish loss of containment audible alarms.

5. Periodic emergency drills are conducted on a regular basis. A safety training video was developed to assist training teammates in these practices.



Since the launch of the Red Zone Programme, the number of incidents has been drastically reduced. The 12 North American melt shops have not had any serious incidents or recordable injuries since July 2019.

Occupational health management



2020
Recognised
Company:
Qatar Steel



Qatar Steel | Heat Stress Programme | Qatar

During the summer months, Qatar is very hot and humid, with temperatures ranging between 33°C to above 50°C and with relative humidity sometimes reaching up to 100%.

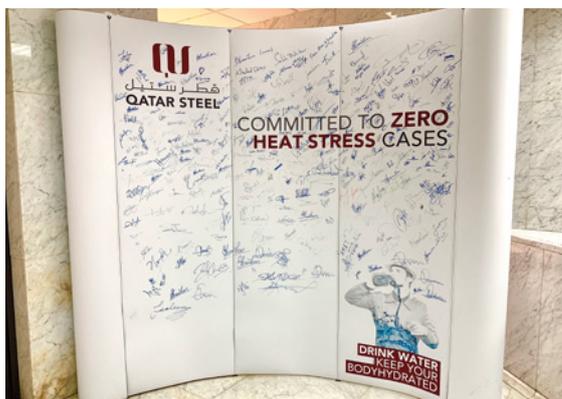
Jobs involving operations in a hot environment where high air temperatures, radiant heat sources, high humidity, or strenuous physical activities have a high potential to induce heat-related illness and injuries to employees engaged in such operations. Considering this situation, Qatar Steel designed and implemented a Heat Stress Management Programme.

The programme aims to protect the health of the worker from heat-related illness and injuries resulting from exposure to heat. The practice is based on the normal risk-based approach.

The practice applies to all personnel working in the Qatar Steel plant (including company employees, contractors and visitors) at all worksites and projects that require individuals to work in a hot climate.

Various Engineering and Administrative controls are applied to the working environment during the summer months to reduce the risk of heatstroke, heat exhaustion, or consequential risk exposures. For example:

-  Cooling vests with ice packs for workers exposed to extreme conditions
-  Rest shelters equipped with first aid box, heat stress information board, drinking water, air conditioning, refrigerators, ...
-  Flag system with different colours indicating the heat index



 Qatar has temperatures ranging between 33°C to above 50°C with relative humidity up to 100%

 There is a high potential to induce heat-related illness and injuries

 **ZERO** heat stress related medical cases reported since summer 2019

The safety and health of Qatar Steel's employees, contractors and visitors supersedes production pressure. If a task cannot be performed safely, it will not be done. The company's goal is Zero Harm, and one of the core values is 'caring', which puts people and environment before the production of steel. The leadership team is fully committed through their Sustainability Policy (signed by the Company Managing Director & CEO), which covers Safety, Health and the Environment.

They have also signed a pledge to show their commitment to the Heat Stress Management Programme, and carry out monthly site visits to monitor whether the HSE policies, procedures and rules are effective and being followed by the employees and contractors. They engage with staff at all levels to discuss HSE related challenges and achievements.

Before 2019 there were numerous medical cases amongst employees and contractor staff, relating to heat stress or heat exhaustion at Qatar Steel. The implementation of the Heat Stress Programme during the summer of 2019 resulted in zero heat stress-related medical cases reported for Qatar Steel and contractor employees. This is an exceptional milestone reached considering the extreme working conditions in the Middle East during summer.



Process safety management



2020
Recognised
Company:

**Tata Steel
Limited**

Tata Steel Ltd. | Digitalisation of Process Safety Performance Indicators for better business results | India

Excellence in Process Safety Management (PSM) has been identified as one of the key safety strategies for achieving the Tata Steel corporate objective of 'Committed to Zero'. After successfully implementing PSM in 46 high hazard departments, the next challenge was to sustain the good work and pursue continuous improvement.

Measuring performance is an essential part of any management process and forms the basis for continuous improvement. Performance and maintenance of process safety activities depend on effective management and review of key process safety performance indicators (PSPIs). It also serves as a tool for sensitisation and improving PSM culture in the organisation.

Tata Steel started by formulating PSPIs with both leading and lagging indicators and monitoring these indicators with the help of Excel-based manual entry process safety dashboards. The data used for all the PSPIs had to be collected from various sources ranging from the control room logbooks to SAP Plant Maintenance and the IT-based Safety Management system. The whole process of collecting data was manual, and it used to take a lot of time and effort to prepare a single dashboard for each department.

Moreover, process safety risks are managed well when the processes operate within Standard Operating Condition and Process Safety Critical Equipment are maintained as per recommended and defined maintenance practices.

It became clear that there was a need to capture deviations on a real-time basis and to take corrective measures as early as possible to prevent process safety incidents.

A standard digital platform with the same display and features, the same business rules, providing real-time information and alerts, was required.

The key features of the IT-based dashboard are:

- Insights of deviation of parameters of a plant/facility by harnessing big data (process and alarm data)
- Evaluation of plant process deviations on a periodic basis (daily, weekly, monthly)
- Maintenance plan compliance records for identified Process Safety Critical Equipment
- Status of lagging indicators such as pending process incident investigation and recommendations pending to address
- User-friendly dashboard, easy charting, reporting, and blogger options

The senior management of the respective department and the central process safety team now have real-time visibility of the following parameters:

- Whether critical process parameters are being operated within a targeted range of Standard Operating Condition (SOC) and Safe Operating Limit (SOL)
- Compliance to planned maintenance order of process safety critical equipment
- Unplanned outages of process safety critical equipment
- Status of Management of Change requests, incident investigation, overdue of incident investigation recommendations, status of bypassed interlocks, Process Hazard Analysis recommendations.

Impact on business

Real-time availability of dashboard information has not only helped in reducing risks but also brought a cultural change in thinking of the line managers toward managing deviations.

Impact of digitalisation on number of process incidents



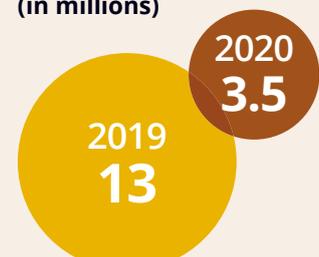
Due to failure of Process Safety Critical Equipment/Process deviations

Impact of digitalisation on production loss (in tonnes)



Due to failure of Process Safety Critical Equipment/Process deviations

Impact of digitalisation on financial loss in INR (in millions)



Due to failure of Process Safety Critical Equipment/Process deviations

Steel Safety Day



2019 Steel Safety Day, Chengsteel, HBIS, PSM gas and asphyxiation emergency drill



Focus areas

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.

The event usually takes place on 28 April, but this year due to COVID-19, it is held on 21 October 2020. It is an occasion to refocus on the five areas that require to be prioritised to reduce the five main causes of serious injury in the steel industry.

The most common causes of serious safety incidents have been identified as follows:

Moving machinery – Isolate, lock or pin all energy sources before any machinery is accessed.

Falling from height – Provide regular training, appropriate harnessing equipment and ensure checks are in place when working at height.

Falling objects – Ensure regular checks are in place to remove or secure objects in risk areas.

On-site traffic – Ensure all traffic on the site is operated safely, including road, rail and pedestrians, and remove all unnecessary traffic.

Process safety incidents – Identify potential process safety hazards that could cause explosions or fires and introduce and maintain adequate barriers and controls.



Due to COVID-19, Steel Safety Day is being held on 21 October 2020

worldsteel in action

Avoiding process safety incidents

Scenario development using bowtie diagrams

In 2020, worldsteel produced a report for its members aiming at answering the question 'What can go wrong?' and illustrated this with a series of scenarios using the bowtie diagram methodology.

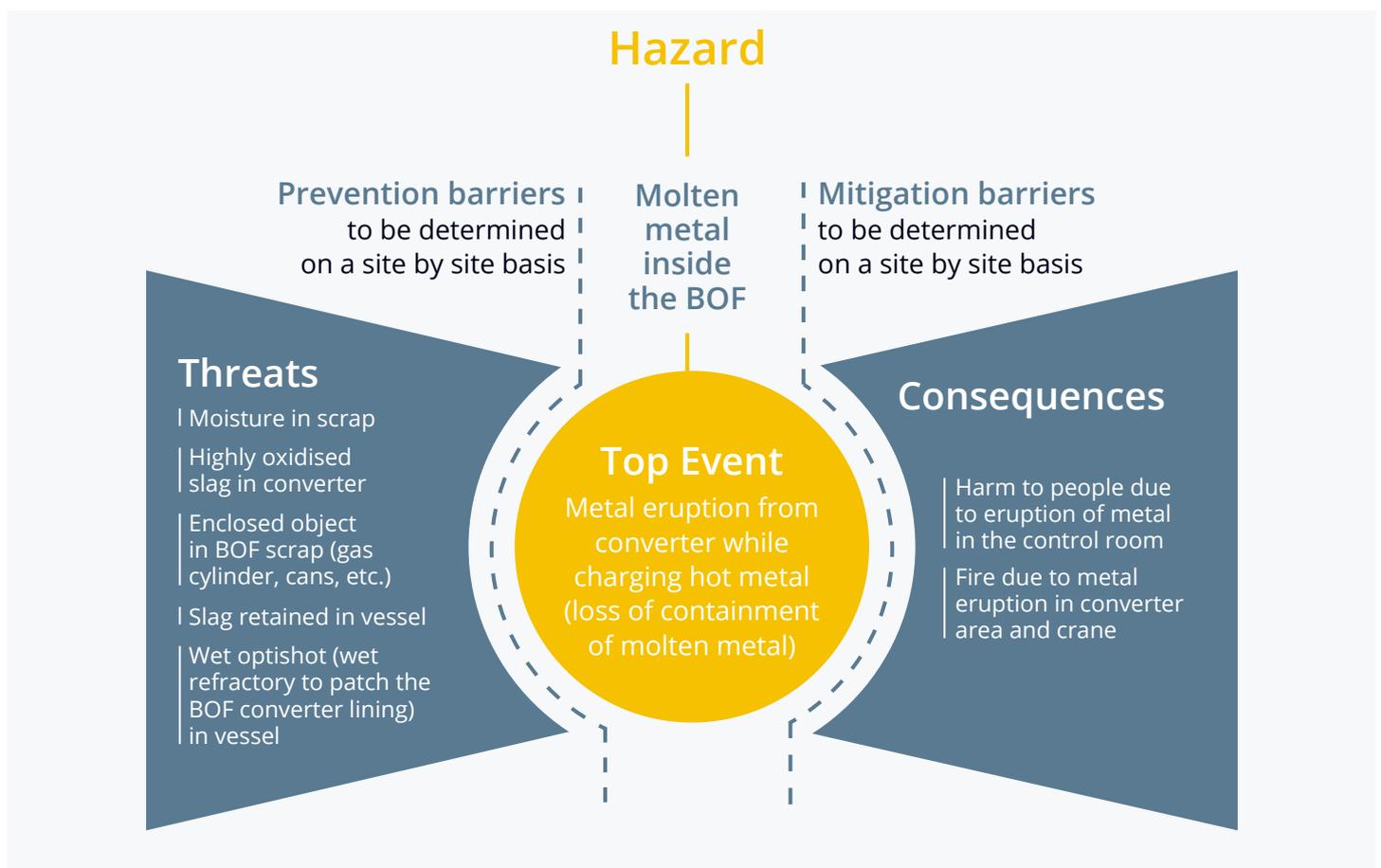
For each steelmaking process, we focused on identifying the threats, hazards and consequences.

The primary purpose of this report was to make available the necessary information to prevent the occurrence of accidents and incidents across our industry.

The bowtie method provides a visually intuitive and readily understood model to communicate the causes and consequences of major hazards, and the barriers and conditions of these barriers, in a way that is easier for non-experts, workforce, engineers and managers to understand.

All steel companies are encouraged to establish and maintain the prevention and mitigation barriers of each bowtie according to their local circumstances in order to prevent potentially substantial financial or environmental consequences, causing lost time injuries, and even fatalities.

Bowtie diagram example:



2020: A year marked by COVID-19

worldsteel response to the pandemic

Alert 18 March 2020

COVID-19 guidance

Members in affected regions are working to reduce risk. worldsteel's safety and health team brings information together in a COVID-19 guidance note. ➔



COVID-19 Meetings 14 May 2020

COVID-19 webinar: Protecting your workers

Webinar addressing the challenges and questions around providing effective respiratory protection to employees in the steel industry. Watch the recording. ➔




Alert 26 March 2020

Steel Safety Day postponed

worldsteel has rescheduled Steel Safety Day from April to October 2020 to reduce the risk of spreading COVID-19 at steel producing sites. ➔



COVID-19 Meetings 4 June 2020

Virtual Mental Health Workshop: COVID-19

Workshop addressing psychological health problems and mental disorder, focusing on the challenges associated with the current health pandemic and return to workplace issues. ➔

Ongoing upload
of resources
onto the
Extranet

Recommended critical controls



Physical removal of vulnerable workers from the sites (operational and staff)



Physical separation of workers who remain on site by implementing social distancing controls



Minimising the numbers of people on worksites by setting people up to work from home (WFH)



Increased use of PPE to protect workforce



Rigorous testing and screening protocols to identify new cases, particularly those that may be asymptomatic



To monitor conformance levels

