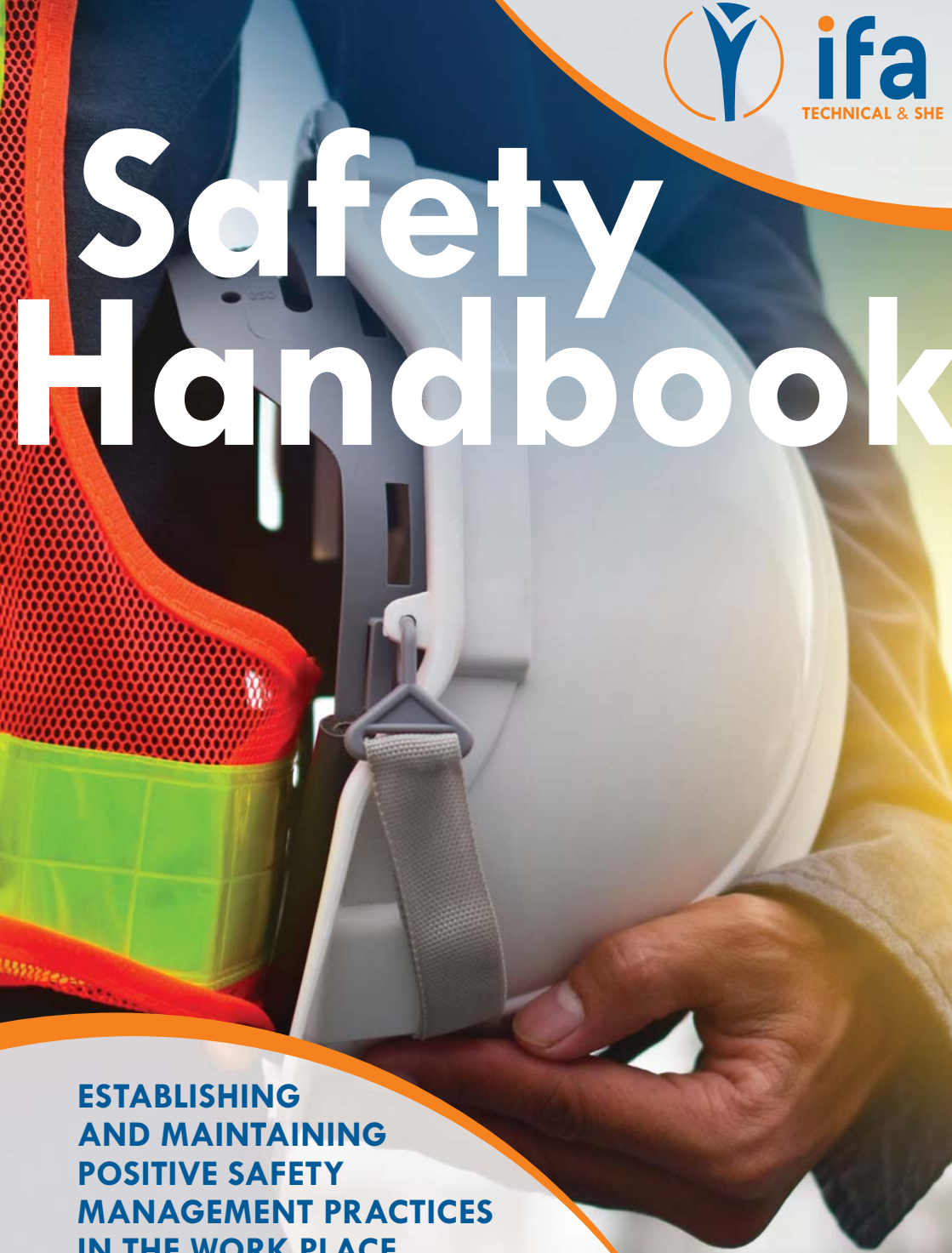
ifa
TECHNICAL & SHE

Safety Handbook



ESTABLISHING AND MAINTAINING POSITIVE SAFETY MANAGEMENT PRACTICES IN THE WORK PLACE

4th edition

“Safety CANNOT be compromised”

The IFA Safety Handbook has been designed as a practical guide for managing safety in the fertilizer industry.

Divided into three sections, the Handbook begins with a description of major guiding principles behind positive safety management, before moving on to outline the specific processes needed to manage safety, and finishes with best practice guidance for day-to-day safety management.

This publication is the result of a collaborative effort by the IFA Technical & Safety, Health and Environment (SHE) Committee's, was designed to support the IFA SHE Principles, which are included at the back of the Handbook.

Intended for frequent reference by all management and line employees, this guide provides a structured framework with which to develop and maintain a coherent safety management system.

On behalf of the International Fertilizer Association, I would like to wish you the very best in using this handbook to continuously develop and build on your safety practices and to achieve the highest levels of safety excellence that characterize the modern fertilizer industry.

Alzbeta Klein
Director General,
International Fertilizer Association (IFA)

1

PRINCIPLES

The need for positive safety management

2

PROCESSES

Establishing positive safety management

3

GUIDANCE

Day-to-day positive safety management


3
2
1
0
1
2
3

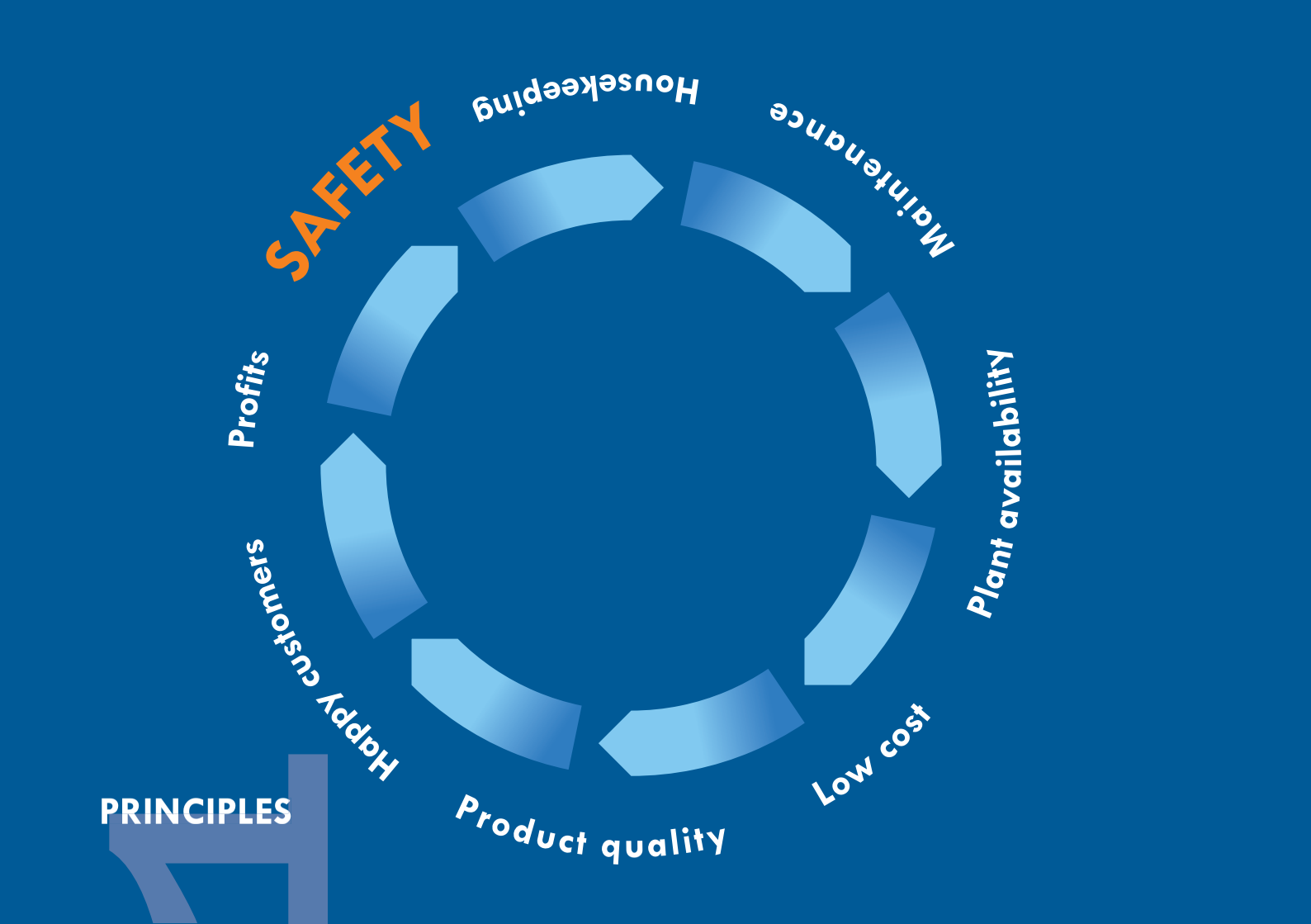
1

Our target is ZERO

Injuries and occupational illnesses, as well as safety and environmental incidents, are **ALL** preventable.

All IFA members shall strive for **ZERO HARM** and adverse environmental impact whilst maintaining a healthy work place for all employees and contractual staff.

Positive safety management is preventative safety management - identifying and minimising the risk of accidents **BEFORE** they happen, rather than removing risks afterwards.


SAFETY
Housekeeping
Maintenance
Plant availability
Low cost
Product quality
Happy customers
Profits
PRINCIPLES

Safety is Integral to Success

SAFETY IS A KEY COMPONENT FOR ANY ORGANIZATION THAT WANTS TO HAVE A SUSTAINABLE PROFITABLE OPERATION.

Injuries to employees and contractors and breaches to the environment all harm the reputation and the profitability of both individual member companies and that of our entire industry.

Equally important is the impact of the accident on injured persons and their families, friends and colleagues.

[Put yourself in the situation where an injury might result in permanent harm to you... consider the limitations that this would impose on you and your family.]

For these reasons it is essential that we are all committed towards achieving the goals of:

ZERO injuries;

ZERO occupational illnesses;

and **ZERO** safety and environmental incidents.

Safety begins with a committed management, engaged and empowered employees, risk awareness and excellence in housekeeping. This in turn develops a strong safety culture leading to improved equipment reliability, reduced maintenance requirements, increased plant availability, reduced costs and better product quality.

... all leading to happier customers and a more sustainable, profitable operation.

'Board level involvement is an essential part of the 21st century trading ethic. Attitudes to SHE are determined by the bosses, not the organization's size.'

'SHE is integral to success. Board members who do not show leadership in this area are failing in their duty as directors and their moral duty, and are damaging their organization.

Leadership from the Top

EFFECTIVE HEALTH AND SAFETY PERFORMANCE COMES FROM THE TOP; COLLECTIVELY AND INDIVIDUALLY.

Over the years, many high-profile safety cases have been rooted in failures of leadership and mismanagement. Health, safety and care for life are thus key business risks. Failure to include them in board decisions is potentially catastrophic.

Protecting the health and safety of employees, contractors or members of the public who may be affected by an organization's activities is an essential part of risk management and must be led by that organization's board of directors and management team.

Furthermore, as health and safety law places duties on organizations and employers, directors can be personally liable when these duties are breached.

So promoting and developing better health and safety performance, is both a legal and ethical obligation of every business leader.

LEAD BY EXAMPLE

Directors, executives and board members need to examine their own behaviour towards SHE management, ensuring that they provide effective leadership in all SHE matters ("lead by example"). For guidance, the OECD publication Guidance for Senior Leaders in High Hazard Industries* is recommended.

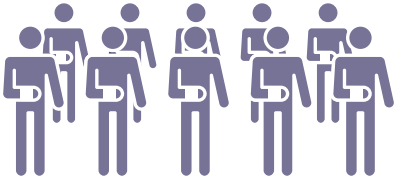
MAKE IT HAPPEN

Business leaders are also responsible for the decisions that empower positive safety management, providing the resources to train employees, procure equipment and improve environmental safety.

* Sources - see page 50


ACCIDENTS
are just the
tip of the
ICEBERG

For every injury resulting in absence from work...



there are 10 minor injuries...

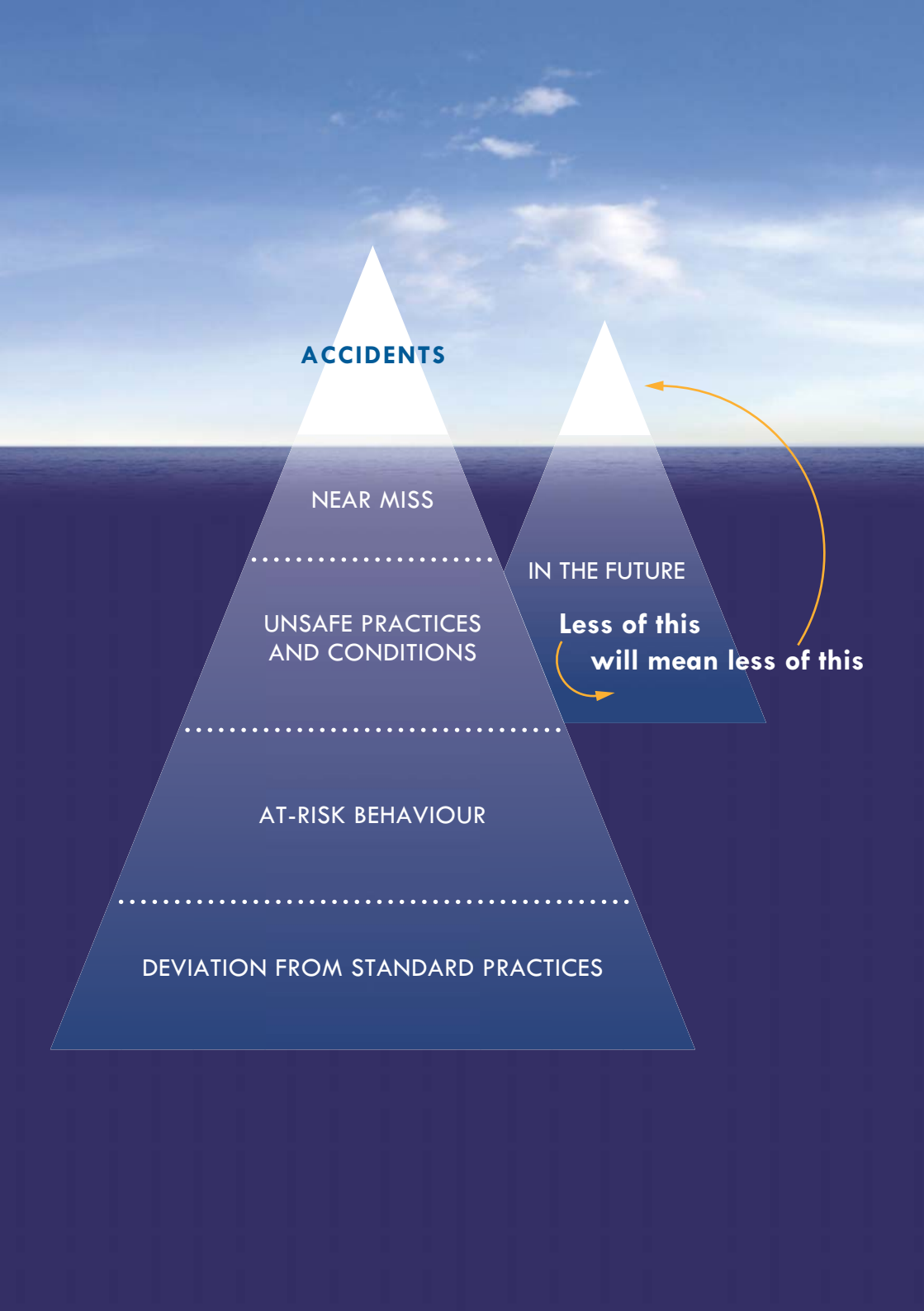
30 material damages...

and 600 near misses!

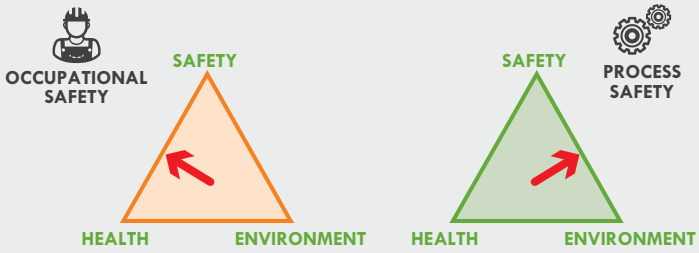
For every ACCIDENT there are many more NEAR MISSES.

Their main causes are UNSAFE PRACTICES and CONDITIONS resulting from AT-RISK BEHAVIOUR which can occur wherever and whenever PRACTICE AND ENVIRONMENTAL standards are OVERLOOKED

So, as the iceberg analogy demonstrates, day-to-day maintenance of below-the-line Best Practices and Environmental Standards [minimising at-risk behaviour, unsafe practices and conditions] PREVENT ACCIDENTS.


ACCIDENTS
NEAR MISS
UNSAFE PRACTICES
AND CONDITIONS
AT-RISK BEHAVIOUR
DEVIATION FROM STANDARD PRACTICES
IN THE FUTURE
Less of this
will mean less of this

PROCESS SAFETY AND OCCUPATIONAL SAFETY PERFORMANCE INVOLVES DIFFERENT TOOLS AND SKILLS

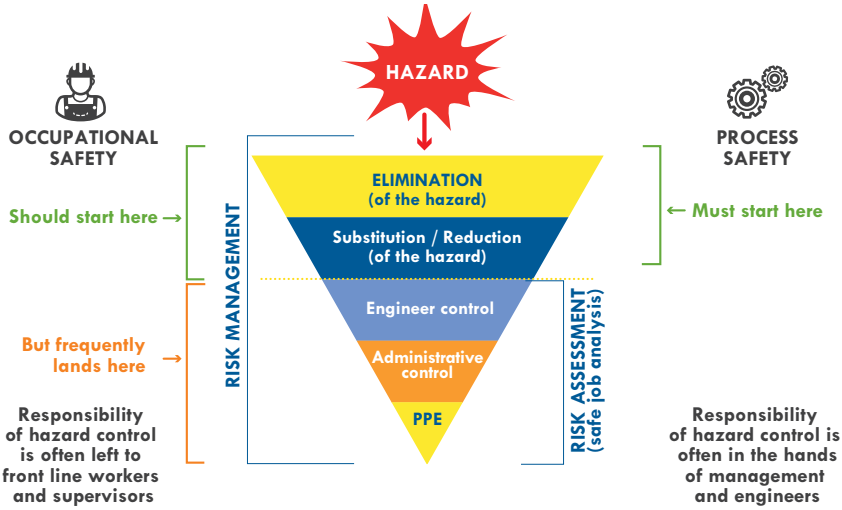


The concerns of occupational and process safety

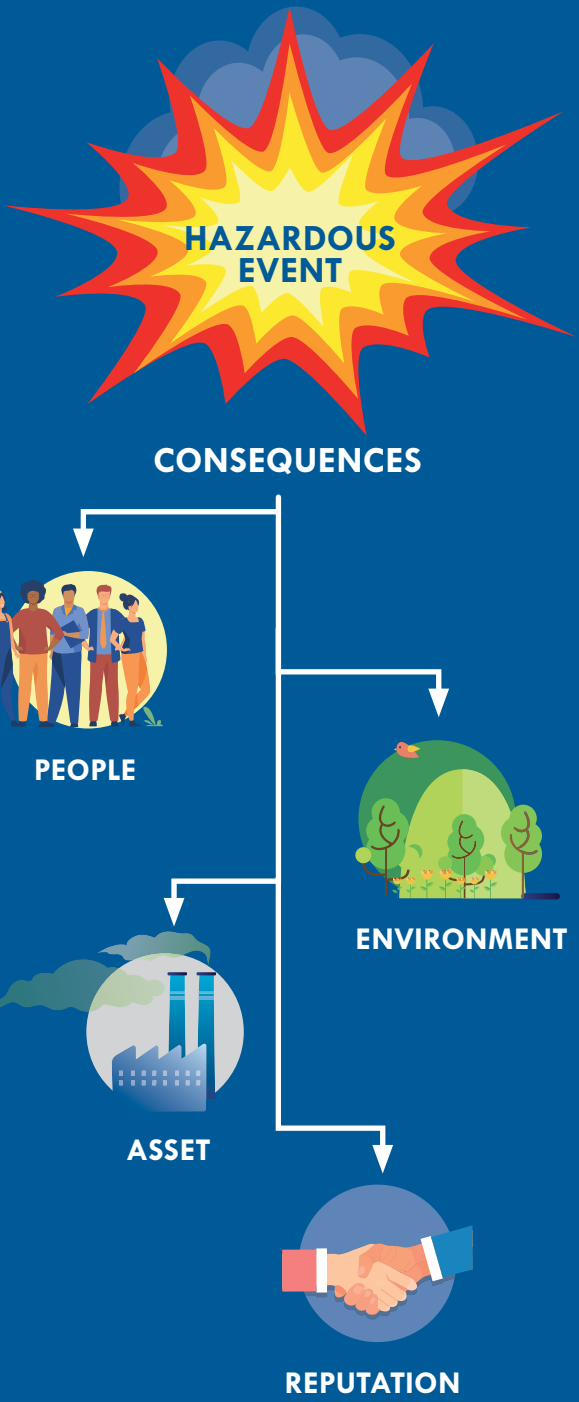
Process and occupational safety are both important!
But there are only slight correlations between the incident causes and the consequences:

- **Occupational safety** involves the safety of the workplace, including personnel safety and individual worker safety concerns that may arise from hazards such as slips and falls.
- **Process safety** are issues that arise from major hazards, such as gas leaks, explosions, and uncontrolled fires.

PROCESS SAFETY AND OCCUPATIONAL SAFETY PERFORMANCE INVOLVES DIFFERENT TOOLS AND SKILLS



Hierarchy of hazard control is a system used to minimize or eliminate exposure to HSE hazards. Controlling exposures to occupational and process hazards is the fundamental method of protecting workers, environment and the asset. The hierarchy of controls should be used as a means of determining how to implement feasible and effective control solutions. The idea behind the hierarchy is that the control methods at the top of the graphic (Elimination) are more effective, reliable and protective than those below and at the bottom (PPE). Following this hierarchy normally leads to the implementation of inherently safer systems, where the risk of illness or injury will be substantially reduced.


HAZARDOUS EVENT
CONSEQUENCES
PEOPLE
ENVIRONMENT
ASSET
REPUTATION

Failures of Safety do not just affect People, either

GOOD HEALTH AND SAFETY MANAGEMENT HAS A BROAD IMPACT. IT IMPACTS BOTH WORKPLACE HEALTH AND SAFETY, PROCESS SAFETY AND THE ENVIRONMENTAL PERFORMANCE OF THE OPERATIONS

While occupational safety normally will affect individuals, process safety accidents could have a broader impact.

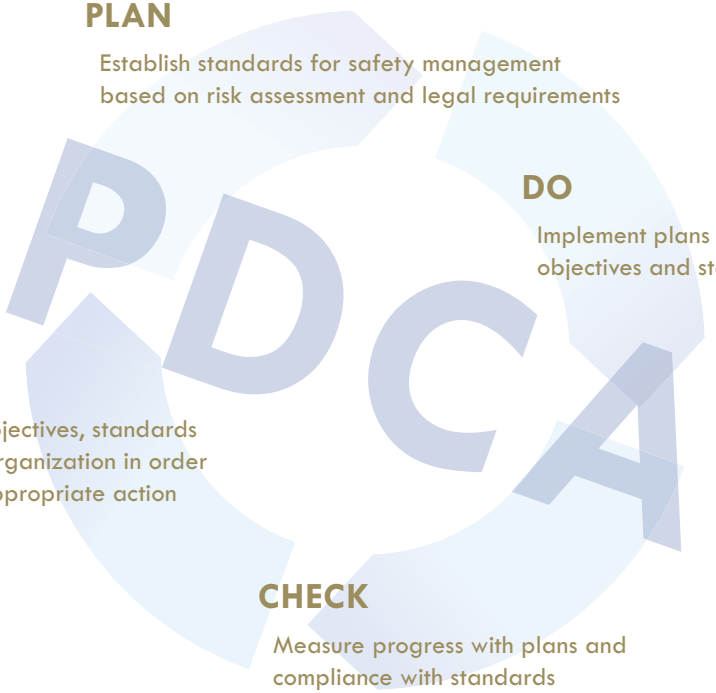
Process safety accidents can result in multiple fatalities inside and outside the plant as well as substantial economic, property, reputational and environmental damage.

Therefore, your COMMITMENT TO HEALTH AND SAFETY MANAGEMENT could improve the productivity, reliability, profitability and the perception of your business to regulators and stakeholders.

GOLDEN RULE No.1

Continuous Improvement*

Positive safety management is an evolving process, where improvements are planned, implemented, continuously monitored and acted upon to maintain a safe working environment.



PLAN

Establish standards for safety management based on risk assessment and legal requirements

DO

Implement plans to achieve objectives and standards

CHECK

Measure progress with plans and compliance with standards

ACT

Review objectives, standards and the organization in order to take appropriate action

For maximum effectiveness, this approach should be applied throughout every aspect of safety management.

* Sources - see page 50

GOLDEN RULE No.2

Key Elements of Successful Health and Safety Management*

Policy

Effective health and safety policies from its leadership set clear directions for the organization to follow

Organization

Empowered leadership and an appropriate management structure are in place for delivering the policy

Planning and Implementation

A planned and systematic approach is in place to implementing the health and safety policy through a proactive safety management system and active employee involvement

Measuring Performance

Performance is measured against agreed standards to reveal when and where improvement is needed

Auditing and Reviewing Performance

Lessons are learned and solutions applied and shared across all parts of the organization (i.e. with other plants)

* Sources - see page 50

Policy

A successful policy for Health and Safety will include these common characteristics:

- Accurate reflection of the values and beliefs of the organization
- A genuine commitment to action
- Reflect the importance of people
- Clear statement of both managers' and individual employees' responsibilities for health and safety

Organization

If the policy is to be realized then to achieve it, the organization must also be defined and should clarify:

- Managers' responsibilities
- Individual employees' responsibilities (see opposite)

To promote a positive health and safety culture, it is necessary to define:

- Methods of control within the organization
- Allocation of resources for continuous improvement
- Means of securing co-operation between individuals, safety representatives and groups
- Methods of communications throughout the organization
- Competence of individuals

Sources - see page 50

Managers' Roles and Responsibilities

- To carry out the requirements of the Health and Safety Policy as expanded by the Safety Management System.
- Managers must ensure that for their area of responsibility the organization exists for implementing the policy.
- Unit and Department Heads are responsible for:
  - informing and engaging all employees in the achievement of the H&S policy
  - primarily and at all times for the health and safety of their staff
  - and for all actions taken by them, and for the health and safety of all third parties who could be endangered
  - developing the technical and interpersonal competence of their staff to facilitate safe behaviour
  - ensure a safe workplace meeting the statutory requirements
  - applying standards described in the management system
  - monitoring, auditing and reviewing the application of safety systems designed to prevent accidents

Employees' Roles and Responsibilities

- It is the responsibility of all employees while at work:
  - to take reasonable care for their own health and safety and all other individuals who may be affected by his acts or omissions at work
  - to comply with all relevant statutory and company policies and procedures
  - to use any machinery equipment, dangerous substance, transport equipment, means of production or safety device in accordance with any training and instruction given to him by the company
  - to use all control measures including personal protective equipment provided by the company
  - to report dangerous conditions and near misses in a timely manner and to take appropriate action to prevent an accident from occurring
  - say NO to conduct unsafe work

Planning and Implementation

Planning is essential for the implementation of health and safety policies. Adequate control of risks can only be achieved through coordinated action by all members of the organization. An effective planning system for health and safety requires organizations to establish and operate a health and safety management system which:

- controls risks
- reacts to changing demands
- sustains a positive health and safety culture

ISO 45001/OHSAS 18001 (occupational heath and safety) has been developed to be compatible with the ISO 9001:2015 and ISO 14001:2015 (Environmental) management systems standards, in order to facilitate the integration of quality, environmental and occupational health and safety management systems by organizations.

Effective Planning and Implementation

The basic planning process also follows the PDCA cycle (see opposite page).

Sources - see page 50

PLAN

- Establish goals and break down into sub-goals where appropriate
- Develop detailed action plans, identifying who is responsible for each and the appropriate time scale

DO

- Management should use all communication channels to inform all employees about the goals and the action plans, including clarification of line responsibility and authority. Necessary education and training are provided to achieve the plan

ACT

- If the results do not support the goal, the causes must be identified and
- Corrective actions undertaken
- When the action plan is completed, it should be reviewed and the lessons learned should be used as input into the next year's plan

CHECK

- Most activities in the plan are carried out at the operational level. Every month, managers check whether the activities outlined in the plan have been completed and the results support the goal

Measuring Performance

Measurement is essential to maintain and improve health and safety performance.

There are two ways to generate information on performance:

- Active systems (leading indicators) which monitor the achievement of plans and the extent of compliance to standards. **Examples:** Safety walks completed per plan, target on H&S training, compliance to work permit standards, Near Miss and First Aid trend monitoring
- Reactive systems (lagging indicators) which monitor accidents, ill health and incidents. **Examples:** Lost time injury frequency rate, total recordable injuries.

Effective procedures are needed to capture both kinds of information.

Sources - see page 50

Measuring Performance – Active Systems

- These provide feedback on observed behaviours independent of an H&S incident occurs
- Various forms and levels of active monitoring include
  - Routine procedures to monitor specific objectives, e.g. quarterly or monthly reports or returns
  - Achievement of training programs planned and learning from experience
  - Periodic examination of documents to check that systems relating to H&S are being complied with
  - The systematic inspection of premises, plant and equipment
  - Environmental monitoring and health surveillance to check the effectiveness of health control measures and to detect early signs of harm to health.
  - Systematic direct observation of work and behaviour
  - Operation of an effective audit system, incl on-time closure of non-conformities
  - Consideration of regular reports on health and safety by the Board of Directors
  - Monitoring / evaluating safety performance of contractors

Measuring Performance – Reactive Systems

- By definition these are triggered after an event and include identifying, investigating and reporting
  - Injuries and cases of health and safety (including monitoring of sickness absence records)
  - Other losses such as plant, property, reputation or environment
  - Incidents, including those with potential to cause injury, harm or damage
  - Hazards
  - Weakness or omissions in performance standards
- Collecting information and investigating to determine the root cause of all actual and potential losses is valuable in learning how to prevent recurrence or occurrence of a more serious event

Audit and Review

Organizations can maintain and improve their ability to manage risks by learning from experience through the use of audits and performance reviews.

An organization cannot manage finances by just an annual financial audit. The same applies to health and safety.

The aim of auditing is to establish that:

- Appropriate management arrangements are in place
- Adequate risk control systems exist, are implemented and are consistent with the hazard profile of the organization
- Appropriate workplace precautions and workforce involvement are in place
- Learning from experience

Performance Review

The aim of the review reflects the objectives of the planning process and it needs to examine:

- The operation and maintenance of the safety management system as designed
- The design, development and installation of the health and safety management system in changing circumstances

Reviewing should be a continuous process undertaken at different levels within the organization.

Sources - see page 50

System Inputs throughout the Safety Management Process

Management leadership commitment and accountability

- Policy
- Organization
- Competence development

Processes - (Typical)

- Risk assessment
- Work permit
- Change management
- Contractor management / working with third parties
- Incident reporting and investigation
- Chemical handling
- Process and electrical safety
- Confined space
- Emergency response
- Safety audit and review

Best Practice Guidance

- Leader safety walks
- Behaviour-based safety process
- Housekeeping
- Work processes (eg. Working at height, Fork-lift and payloader safety, Lifting operations (crane safety)
- Manual handling, Portable hand and power tools, Workshop machines
- Office safety
- Driver safety

Assessment and improvement

- Internal auditing and Certification body audit
- Management review
- Key performance indicators (KPI) – leading and lagging
- Obtaining feedback from employees through Safety Surveys

REMEMBER THE GOLDEN RULES

1. PDCA: Continuous assessment and development maximizes safety management effectiveness

2. POPMA: The key elements of positive safety management

Sources - see page 50

Safety Management Processes

Risk assessment

Work permit

Modifications/management of change

Incident reporting

Incident investigation and follow up

Handling chemicals

Process and electrical Safety

Confined space Emergency Response

Safety Auditing and Review

Behavioral Safety

Safety Management Processes

The processes outlined in the following section of the IFA Safety Handbook are vital for establishing positive safety management systems.

2 PROCESSES

Risk Assessment

'All accidents are preventable'... This is said very often, particularly after the event. In reality, they are only preventable if they are foreseen.

Risk assessments are mandatory:

- At plant design stage using tools like HazId (Hazard Identification), HazOp (hazard and operability study), hazan (hazard analysis), and QRA (Quantitative Risk Assessment)
- For every day activities where an unacceptable level of risk is identified
- Proper risk assessment should take place as soon as the work is identified
- For maintenance and irregular activities through Safe Job Analysis and Work Permit

Those involved in the work execution should be involved in conducting the risk assessments and prior to starting any activities, the risk assessment document should be used to communicate the hazards and risks to those likely to be exposed, as well as the control measures identified to provide protection.

It is the responsibility of those at risk to apply the control measures identified to prevent exposure to risk. A supervision of high risk task should be implemented.

Work Permit

A work permit shall be issued for all work to be carried out, except for low risk and identified repetitive jobs or work carried out in workshops.

Such exceptions from the work permit requirement shall be listed and approved by the site manager, and shall be carried out in accordance with written instructions.

The work associated with the preparation and issuing of a work permit covers:

- a clear description of the work to be carried out
- review of documentation
- risk assessment and assignment of authorisation level
- preparation of special permits (e.g. excavation, confined space entry)
- safe job analysis with the preparation of safe work procedures and identification of safety precautions.

Based on this, the work permit can be prepared and issued. Upon completion of the work, the work permit shall be signed off.

The work permit can only be issued by a competent person, who is on a register of Permit Officers maintained by each unit.

A monthly audit of the Permit System should also be carried out to identify potential deviations.

Jobs that require a work permit include, but are not limited to:

- working in potential oxygen deficiency or enrichment
- working in potential flammable / explosive atmosphere
- working at potential high temperature / pressure
- potential exposure to hazardous chemicals (e.g. toxic, reactive, acid, caustic)
- working in confined space
- elevated work, work at height and danger of falling objects
- bypassing, removing or altering safety devices and equipment
- electrical troubleshooting or repair of electrical circuit
- maintenance or repairs in areas, or to equipment or lines, containing or supposed to contain hazardous materials or conditions
- manual or powered excavations
- use of mobile cranes
- exposure to moving and/or rotating machinery

Modifications/Management of Change

The aim is to:

- maintain plant integrity
- eliminate potential sources of hazards resulting from uncontrolled modifications and changes to the process, design and chemicals involved
- ensure that proposals are given a controlled treatment regarding all aspects of technical and safety requirements and government regulations
- ensure financial control
- review changes to the organization which affect routines

Work arising from temporary or permanent changes to plant, processes, materials, safety systems, etc. can only proceed after approval using the change management process.

The change management process includes:

- An assessment of hazards, risks and necessary control measures
- Development of a project/work plan that specifies timescales, control measures and responsibilities
- Design of the change
- Training and communication needs
- Formal authorisation
- Pre start-up safety review

Incident reporting

Reporting of accidents, near-miss incidents, sick leave, environmental incidents and security breaches requires that all persons employed by the organization or under service contract for the organization (e.g. contractor, transporter, warehouse operator), who discover or cause an incident are responsible for immediate reporting of the incident to his/her supervisor.

Incident

A sudden work related accident or near-miss, a security breach, sustained in service.

Accident

An unintended incident which results in injury to persons and/or damage to property, the environment, third party or which leads to production loss.

Near-miss

An unintended incident not leading to injury or damages, but which under different circumstances could have become an accident.

Hazardous Condition

A physical condition that could lead to a near-miss or accident.

A formal and systematic approach should be available to record and then follow up on all reported incidents, near misses and First Aids. The system in use should be capable of providing statistical information and trends to drive continuous improvement.

Incident Investigation and Follow Up

All incidents should be investigated for identification of root causes and actions to prevent recurrence.

The investigation process requires:

- Establish an investigation team with a clear mandate
- Determining the investigator (high severity incidents require independent investigation)
- Collecting information
- Analyzing, evaluating and organizing information. Many methods of getting to the root causes, such as “ask why five times” and “fish-bone analysis”, are readily available
- Preparing the draft investigation report
- A summing up meeting
- Implementing the actions learned to prevent recurrence
- Regular training and analysis shall be conducted within a PDCA management cycle of this aspect

Handling Chemicals

Many of the materials handled are potentially harmful, however they can be used safely provided the appropriate precautions are taken.

- Use the information available on the material safety data sheet.
- Potential exposure shall be identified and control measures to eliminate or reduce risk to be taken such as LOTO (lock out, tag out) and Try Out.
- Wear the recommended protective equipment when working with chemicals or breaking into pipelines that have contained them.
- Make sure the equipment and plant has been made safe for you to work on using the work permit.
- Always slacken the nuts on flanges on the side away from you first. Position yourself above rather than below a joint to be broken.
- Carry out instructions carefully when transferring chemicals from one vessel to another.
- Always use earthing leads when transferring liquids and gases.
- Keep all materials in clearly labelled, well sealed containers. Pipelines should also be labelled.

IFA strongly recommends that fertilizer producers participate in its Product Stewardship programme "Protect & Sustain", which includes in depth safety audit and review methodologies. For more information, please visit www.fertilizer.org

Process Safety

Process safety encompasses technical safety, operational safety and personnel safety.

The processes in the plant shall be studied to understand the hazards involved in operation. The plants shall be classified using commonly available risk matrices that consider the potential severity and likelihood of occurrence.

Subsequently, control measures shall be implemented to eliminate or reduce the risk to an acceptable level.

Process Safety Management focuses on three key factors:

- Reducing human errors through prevention, training and other tools that help us work better and safer.
- Operating within the limits that design and technology allow us, in order to know what we can do and how far can we go.
- Guaranteeing that the safety barriers that we implement are always available and reliable.

Attention to the **quality** of the risk assessment and the **follow-up** of identified actions is essential.

Key steps in eliminating or maintaining risk at an acceptable level include:

- Execution of studies based on a regular (cyclic) basis.
- Involvement of all relevant disciplines (management, process, mechanical, process control, operation, maintenance) in the execution of these studies.
- A well defined procedure for follow up of process studies, including independent verification of the actual risk reducing measures in their implemented state.

Methods available for risk assessment include:

- Rapid Risk Ranking
- Hazard and Operability Studies for High Risk plants or new type processes in Medium Risk plants
- Fault tree analysis for critical parts or tasks
- Quantitative Risk Analysis
- Safety Integrity Level analysis (SIL) to be performed on instrumented safety functions for High and Medium Risk plants
- Blast Pressure Map based on design accident load
- Fire Prevention Risk Categorization with analysis

Emergency Response

All operations should establish an emergency response plan that defines local emergency coordination teams and routines for reporting and handling emergencies.

The emergency plan should:

- Clarify the responsibilities of various personnel as part of the emergency response team
- Set the need for developing competence of those directly involved
- Identify roll call and evacuation procedures
- Describe the communication procedures internally in the event of an emergency arising
- Describe the communication procedures with external resources such as the emergency services and local authorities
- Set the standard for testing the emergency plan
- Regular training and analysis within a PDCA management cycle

Safety Audit and Review

To ensure compliance with all legislation or company objectives, a systematic, critical, in-depth examination of an organization's health and safety management system should be conducted.

A safety audit can cover the whole organization's health and safety management system or particular aspects thereof, such as risk assessment procedures, process safety, issue and control of personal protective equipment etc.

Organizations are required to appoint and maintain competent safety auditors to conduct safety audits of each relevant industrial undertaking, or a safety review officer to conduct a safety review for a smaller setup. The audit/review is carried out on an annual or a half-year basis, providing an organization with a clear picture of its health and safety management performance and allowing remedial actions to be taken before incidents occur.

A safety audit should also be carried out before plant start up after turnaround, plant modifications or revamp.

The audit should highlight all positive and negative aspects of health and safety.A review of the audit outcomes by the senior management team will result in further development of the company safety plan.

Actions to close identified gaps shall be followed up.

A Safety Audit should cover:

- Compliance with all relevant legislation
- All departments within an organization
- All health and safety policies and procedures, including review of outcomes from the internal monitoring of the safety management system
- Identification of (and advice on) reasonable. practical measures to control workplace risks
- Reinforcement of the organization's commitment to continual improvement of health and safety

Behaviour-based safety

No name, no blame

This is a process that involves managers and operational employees.

- Walk - observe – communicate: Managers show their commitment to safety through regular in-field inspection with the aim to have dialogs around safety and safe behavior.
- Operational employees should carry out observations on their peers and provide immediate feedback to those observed.

The feedback process reinforces safe behaviours and reduces at risk behaviours, thereby reducing the exposure to risk.

Such observations should be carried out very openly and in a 'no name, no blame' way and can include a critical behaviour checklist.

Data collected through this process is used to analyze problems that lead to at-risk behaviours and root causes and solutions are identified to eliminate these.

Critical behaviour examples include:

- looking where you are walking
- keeping your eyes on the task
- lifting loads using legs and not the back
- wearing gloves and eye/head protection
- using a safety harness when working at height
- using tools that are suitable for the task
- using tools that are in good condition
- task performed according to what was agreed (in work permit or by SOP)

Guidance

Housekeeping

Leader Safety Walk

Handling Chemicals

Working at Height (Fall Protection)

Lifting Operations

Fork-lift and Payloader Safety

Machinery Operation

Portable hand and power tools

Manual handling

Office safety

Driver safety

Transport safety

Guidance

The guidelines in this final section of the IFA Safety Handbook provide best practice checklists for day-to-day positive safety management.

GUIDANCE

Housekeeping

Always clean, always tidy

This is the foundation stone for good safety and productivity: good housekeeping standards must be maintained at all times.

- **At all times**
  - ☐ Are all passage ways, escape routes and fire doors clear?
  - ☐ Are rubbish and other waste disposed of to the correct bins/containers?
  - ☐ Have potential slips, trips or falls been eliminated?
  - ☐ Have spills been reported and cleaned up promptly, ensuring safe disposal of materials?
- **During use**
  - ☐ Is the work area tidy while work is in progress?
  - ☐ Are hoses, electrical cables, etc. routed safely?
- **After use**
  - ☐ Is the work area clean and tidy, ready for the next use?
  - ☐ Are hoses, electrical cables, etc. coiled and hung up after use?
  - ☐ Are tools , chemicals and equipment stored in designated storage places?
- **Remember the job is not complete until the work area is clean and tidy**

Leader Safety Walks

Walk - observe - communicate

Leaders go to the work place to:

- **Observe persons at work with focus on**
  - ☐ Are the correct standards being applied?
  - ☐ Is the risk assessment relevant for the task done?
  - ☐ Are people behaving appropriately?
  - ☐ Check for technical issues leading to specific at-risk behaviour
- **Provide feedback to those observed**
  - ☐ Positive feedback on safe observations
- **Follow up with open discussion**
  - ☐ Discuss issues putting those observed at risk in order to raise awareness of the hazards involved
  - ☐ Discuss the potential consequences of failing to address these risks
  - ☐ Agree on the safest way of working
  - ☐ Has this reduced or eliminated the likelihood of an accident?

These safety walks should be carried out by managers and supervisors

Handling chemicals

Safe handling of potentially harmful chemicals

Many of the materials used in fertilizer manufacture are potentially harmful. However, they may be used safely providing appropriate precautions are taken:

- ☐ Is the material safety data sheet available and is the information provided being used?
- ☐ Has the employee the knowledge of the chemical being used?
- ☐ Has the potential for exposure been identified and have control measures been taken to eliminate or reduce risk?
- ☐ Is the recommended protective equipment available and in use for working with chemicals or entering spaces (notably pipelines) that have contained them?
- ☐ Have equipment and plants been made safe to work on, using a work permit?
- ☐ Are all materials and pipelines clearly labelled?
- ☐ Are material containers well sealed?
- ☐ Are instructions followed fully and carefully when transferring chemicals from one vessel to another?
- ☐ Make sure always that:
  - Nuts on flanges are slackened first on the side away from the worker
  - Where a joint is to be broken, the worker is positioned above rather than below the joint
  - Earthing leads are used when transferring liquids and gases

Working at height (Fall Protection)

All work where workers could fall and injure themselves

- **Plan properly**
  - ☐ Have all activities involving work at height (include one-off jobs and tasks which only take a few minutes) been identified?
  - ☐ Have the risks involved been fully assessed?. Do not underestimate them - simply 'taking care' is not enough. Including danger of falling objects.
- **Avoid work at height where possible**
  - ☐ Are different equipment or working methods available? (Check what new equipment is available to buy or hire)
  - ☐ Are fixtures and fittings, plants and services all designed and installed to minimize the need to work at height?
- **Select the right equipment and people – do not make do to save money or time**
- **Use equipment with a working platform and guard rails wherever possible (e.g. podium steps, cherry pickers or tower scaffolds)**
  - ☐ Are contractors competent and experienced to carry out the task?
  - ☐ Are safety equipment (hardness, hooks) maintained and fit for the service?
  - ☐ Are all scaffoldings checked by competent person duly trained for scaffolding inspection?
- **Ladder safety**
  - ☐ Is the ladder of the right type and length?
  - ☐ Is it secured at an angle of around 70 degrees?
  - ☐ Is it correctly positioned to avoid over-reach?
  - ☐ Are tool belts and/or hoist lines in use to carry equipment/materials up the ladder?
- **Train those doing the work**
  - ☐ Do they know how to erect, use and dismantle the equipment correctly?
  - ☐ Check that contractors have suitable training - ask to see certificates
  - ☐ Are the employees training in at height evacuations, including fall using harness?
- **Inspect and maintain**
  - ☐ Inspect all equipment regularly
  - ☐ Damaged equipment must be repaired or taken out of use
- **Supervise and monitor**
  - ☐ Is work being carried out as planned?
  - ☐ Is the right equipment being used?

Lifting operations

Lifting activities involving cranes, hoists or other mechanical devices

- **Such work can only be carried out by competent persons**
- **Before starting**
  - ☐ Have the lift method and equipment been assessed and selected by a competent person?
  - ☐ Are the chosen lifting method and equipment those most appropriate for the task?
  - ☐ Are the operators trained and certified for that equipment?
  - ☐ Is the rigging of the load carried out by competent persons?
  - ☐ Are lifting devices and equipment certified in accordance with statutory requirements?
  - ☐ Check that the load does not exceed the dynamic and/or static capacities of the lifting equipment
  - ☐ Check that safety devices installed on the lifting equipment are operational
  - ☐ Make sure a visual examination of all devices and equipment is carried out before each lifting operation
  - ☐ Is the area/surface on which lifting equipment is placed adequate for additional load and free from any underground cables / water pipes etc.?
  - ☐ Has the area where the lifting is taking place been isolated to prevent persons (including those directly involved) from walking beneath the lift area?

Fork-lift and payloader safety

Keeping vehicles and pedestrians safe

- **To prevent accidents**
  - ☐ Is the correct fork-lift truck / payloader being used for the task?
  - ☐ Is the braking system adequate and fully functioning?
  - ☐ Are operators, supervisors and managers adequately trained (certificates in place?)?
  - ☐ Lay out the site to ensure safe movement without danger to pedestrians
  - ☐ Remove obstructions where possible
  - ☐ Obstructions that cannot be removed, must be clearly marked
  - ☐ Have appropriate seat restraints been fitted?
  - ☐ Have appropriate visibility aids, such as mirrors, flash lights, been fitted?
- **When operating a fork-lift truck or payloader**
  - ☐ Do not overreach or overbalance
  - ☐ Avoid uneven or steeply sloping ground
  - ☐ Keep low speed - in particular around corners
  - ☐ Do not overload
  - ☐ Lower the load before operating the truck
  - ☐ Ensure adequate visibility to avoid collisions with pedestrians and objects
  - ☐ Do not use handheld mobile phones while driving
  - ☐ Use safety belt

Workshop machines

Safe machine operations

- **Before work starts**
  - ☐ Are all personnel trained and competent in the use of their machines?
  - ☐ Have all guards and safety devices been checked? Has any damage been reported and fixed?
  - ☐ Are all objects to be worked on firmly clamped before starting cutting machines such as drills and milling machines?
  - ☐ In an emergency, can workers stop their machines and those of their fellow workers?
- **During work**
  - ☐ Is a brush or rake used to remove swarf or waste materials?
  - ☐ Is the floor area around the machine clean and free from obstruction?
  - ☐ Are eyes and hands protected when operating machines?
  - ☐ Are machine operators concentrated and free from distraction by others?
- **When work stops**
  - ☐ Before a machine is left, make sure that the power is always isolated
  - ☐ Always make sure that the power (electric, mechanic, pneumatic, chemical) is isolated before performing any maintenance on the machine (apply work permit if considered necessary)
  - ☐ Have good housekeeping rules been applied? Has the machine and its surrounding area been left clean and tidy?

Portable hand and power tools

The right tools for the job

- **Tool selection**
  - ☐ Are the correct tools available and being used for their proper purpose?
  - ☐ Are tools inspected before use?
  - ☐ Are they clean and in a good condition and are all safety devices functioning?
  - ☐ Are the cables and hoses of electrical and pneumatic tools undamaged?
  - ☐ When not in use, are the cables and hoses of electrical and pneumatic tools put away?
  - ☐ Are the correct lengths of cable or hose and, where necessary, their proper extensions available and used correctly?
  - ☐ Are low voltage power tools used wherever possible?
  - ☐ Is suitable protective equipment available and used?
  - ☐ Are the electrical sockets undamaged, isolated and earthed?
  - ☐ Have the electrical supply and safety fuses been provided as per the requirement of the power tool?
- **After use**
  - ☐ Is all equipment cleaned after use?
  - ☐ Is it put away correctly in its designated location?
  - ☐ Are damaged hand and power tools reported and marked ‘out of service’?

Manual handling

Pushing and pulling

- **Consider the following criteria:**
  - ☐ What handling devices may be required?
  - ☐ What force may be required to move the object?
  - ☐ Will this require more than one person to move the required object?
    - ☐ If a team is required, do members understand their roles and responsibilities?
  - ☐ Have any slopes and uneven surfaces been considered?
  - ☐ Are those involved pulling/pushing with the appropriate stance and pace?

Lifting and moving objects

- ☐ Can the manual lifting be prevented (other methods)?
- ☐ Are staff members instructed to think before lifting/handling?
- ☐ Do they consider the following criteria?
  - ☐ Keep the load close to the waist
  - ☐ Adopt a stable position
  - ☐ Get a good hold
  - ☐ Start in a good posture
  - ☐ Do not flex the back any further while lifting
  - ☐ Avoid twisting the back or leaning sideways
  - ☐ Keep the head up when handling
  - ☐ Move smoothly
  - ☐ Do not lift or handle more than can be easily managed
  - ☐ Put down, then adjust

Office safety

Safe Office Behaviour

- **Are staff members aware of the following office behaviour guidelines?**
  - ☐ Do not climb on chairs, desks or boxes - use a step ladder instead
  - ☐ Do not lean back in your chair - keep all legs on the floor
  - ☐ As you sit down, reach out and take hold of the chair. Be sure that the chair is beneath you as you sit.

Circulation

- **Make sure that staff members follow these simple rules as they move about the office**
  - ☐ Walk - do not run
  - ☐ Look where you are going - do not block your view by carrying loads higher than eye level
  - ☐ Do not read while walking - it does not save enough time to justify the risk
  - ☐ Hold onto handrails when using stairways
  - ☐ Use elevators, if they are available, when carrying boxes
  - ☐ Do not restrict floor space and particularly walkways with boxes etc. - this can be particularly dangerous during an emergency evacuation!

Storage

- **Are office workers aware of the correct use of storage?**
  - ☐ Closing one drawer in a filing cabinet before opening another prevents the cabinet from tipping over
  - ☐ Close your desk drawers before getting up and close file drawers before walking away to avoid the risk of people walking into an open drawer
  - ☐ Supplies should be stored inside cabinets, not on top of them, with heavy items in lower drawers or on lower shelves

Office safety

Good Housekeeping

- **Untidy and dirty office spaces present a variety of health and safety hazards**
  - ☐ Does everybody understand the importance of keeping the office clean and tidy and do they do so?
  - ☐ Are the PPE for Control Room personnel being checked regularly?
- **Slippery surfaces, typically caused by spilled drinks or water from umbrellas, are particularly dangerous and need to be cleaned up immediately**
  - ☐ Do staff know the procedure for dealing with spillages?
- **Unsafe conditions such as defective equipment, burned out lights, loose steps, torn carpet, etc. may all create workplace hazards**
  - ☐ Do staff members know the procedure for reporting unsafe conditions?
  - ☐ Is the workplace free of unsafe conditions?

Electrical Safety

- **Electrical, telephone and computer cables are all potential tripping hazards if left lying around floor areas, particularly walkways.**
  - ☐ Are the floor and walkways free of cables and similar hazards?
- **Do not overload wall sockets and extension cords**
- **Do not touch electrical switches, sockets, plugs, etc. with wet hands**
  - ☐ Are staff aware of these simple electrical safety rules? Do they follow them?

Fire Hazards and Smoking

- **Do not throw matches, ashes or cigarette butts into wastebaskets**
  - ☐ Are staff members trained and practiced in the emergency evacuation of the office?
- **If the building has been designated as a smoke-free building - DO NOT smoke in the building**
  - ☐ Are NO SMOKING regulations observed and enforced?

Driver safety

Employees with heavy driving duties

- ☐ Are employees with heavy driving duties (sales people, truck drivers, etc.) trained in defensive driving?
- ☐ Is defensive driving training refreshed at least every three years?
- ☐ Are national requirements - traffic rules, driving and vehicle licenses - being met?
- ☐ Do employees with heavy driving duties follow specific health checks (eg. colour blindness, hearing etc.)
- ☐ Do vehicles used for driving duties comply with national requirements for safety controls?
- ☐ Are vehicles serviced in accordance with car manufacturers' recommendations?
- ☐ Is driving part of the annual appraisal for those with heavy driving duties?
- ☐ Is unsafe driving reacted upon?

- For car hire, the recommended type of car is medium size (category C).
- Always consider whether alternative means of travel can be used, e.g. by train.
- Talking on the mobile phone while driving should be avoided as far as possible, and should be limited to receiving calls of short duration. Only hands-free mobile phones shall be utilized.
- Keep your distance to the vehicle in front.
- Hands off navigation systems and phone while driving.
- If tired, take a break. Consider staying overnight in a hotel rather than driving at nighttime.
- Driving under the influence of alcohol is a criminal offense. Also be aware of side effects in case of taking drugs for medical reasons. Take a taxi instead or hire a professional driver.
- When in countries where you are unaccustomed to the driving culture, consider hiring a professional driver.
- For security reasons, consider whether driving at night is safe.

Transport safety

Supplier

- **Ensure that the purchase contract includes provision for the following safety protocols:**
  - ☐ Loading instructions and equipment
  - ☐ Safety instructions
  - ☐ Personal protection equipment
  - ☐ Emergency plan

Transport

- **Transporters need to meet the following safety criteria:**
  - ☐ Are the transporters competent and qualified for the job?
  - ☐ Do they have sufficient safety knowledge of the materials they carry?
  - ☐ Do they follow site rules when on site?
  - ☐ Does the transportation vehicle meet the guidelines /statutory regulations?
  - ☐ Do they have an appropriate emergency plan?

Customer

- **The sales contract must make provision for:**
  - ☐ Unloading instructions and equipment
  - ☐ Safety instructions
  - ☐ Personal protection equipment
  - ☐ Emergency plan

Acknowledgments

The IFA Secretariat would like to thank the publication's task force, Mr. Jan-Petter Fossum (Yara International), Mr. KK Kaul (DCM Shriram) and Mr. Yasser Alabbasi (Gulf Petrochemicals Industries Co.), for their significant contribution and editorial support.
Coordination: Ms. Lucia Castillo Nieto (IFA Technical & SHE Committee)

Sources

Leadership and Commitment, page 2/3

Based on 'Why Leadership is Important' by the Health and Safety Executive (United Kingdom) with quotes from health and safety leaders in the public and private sectors from the same source.
Source: http://www.hse.gov.uk/leadership/whyleadership.htm

Corporate Governance for Process Safety, Guidance for Senior Leaders in High Hazard Industries, page 3

Source: OECD Environment, Health and Safety Chemical Accidents Programme; June 2012;
https://www.oecd.org/chemicalsafety corporategovernanceforprocesssafety.htm

The Golden Rules of Safety Management, page 11/12

Based on 'Successful Health and Safety Management' by the Health and Safety Executive (United Kingdom)
Source: Successful Health and Safety Management (HSG65, ISBN 0 7176 1276)

Further Information

Additional Copies of this Handbook

Additional copies of this Safety Handbook are available to IFA member organizations and may be ordered by
e-mail: publications@fertilizer.org, or **telephone:** +33 1 53 93 05 00
Furthermore, a downloadable PDF version is available through the 'Technical' section of the web site: **fertilizer.org**

Training Support

IFA is committed to supporting its members in their efforts to improve safety standards. If you are seeking help in developing safety training, please contact IFA to find out what support is available. PowerPoint training support presentation material is available from the 'Technical' section of the web site: **fertilizer.org**

4th edition of the Safety Handbook, Published May 2021

IFA Safety, Health and Environment Principles

1. All members shall demonstrate leadership and management commitment with regard to safety, security, health and environmental issues in fertilizer production, distribution and sales.
2. All members shall strive for zero harm and adverse environmental impact whilst maintaining a healthy work place for all employees and contractual staff.
3. All members shall ensure that safety, security, health and environmental issues are integrated into their corporate policy and receive the utmost importance and priority.
4. All members shall ensure adequate financial and human resources for continual improvement of safety, security, health and environmental performance.
5. All members shall comply with local safety, security, health and environmental laws and embrace international laws and best practices as much as possible.
6. All members shall establish and improve their safety, security, health and environmental performance through annual objectives, targets or key performance indicators.
7. All members shall establish adequate procedures and controls to ensure that safety, security, health and the environment are not jeopardized at any time or in any form.
8. All members shall ensure that all employees and contractual staff have the right competence and are adequately trained and informed about safety, security, health and the environment related to their specific activities, and shall encourage the participation of employees and contractual staff for further improvements.
9. All members shall adhere to the principles of hazard and risk assessment in evaluating all their activities to ensure that safety, security, health and environmental standards are continually enhanced.
10. All members shall strive to subscribe to safety, security, health and environmental management systems that will be subjected to internal and external auditing.
11. All members shall voluntarily share information with regard to experiences and lessons related to safety, health and the environment with all employees and contractual staff, and with other IFA members, unless there are legal constraints or if the information is of proprietary nature.
12. All members shall strive to continually promote safety, security, health and environmental matters to enhance the social responsibility and accountability of the global fertilizer industry.

49 avenue d'Iéna
75116 Paris – France
Tel: +33 1 53 93 05 00
ifa@fertilizer.org
www.fertilizer.org
@FertilizerNews