Knowledge grows

Process Safety Management

What is it?

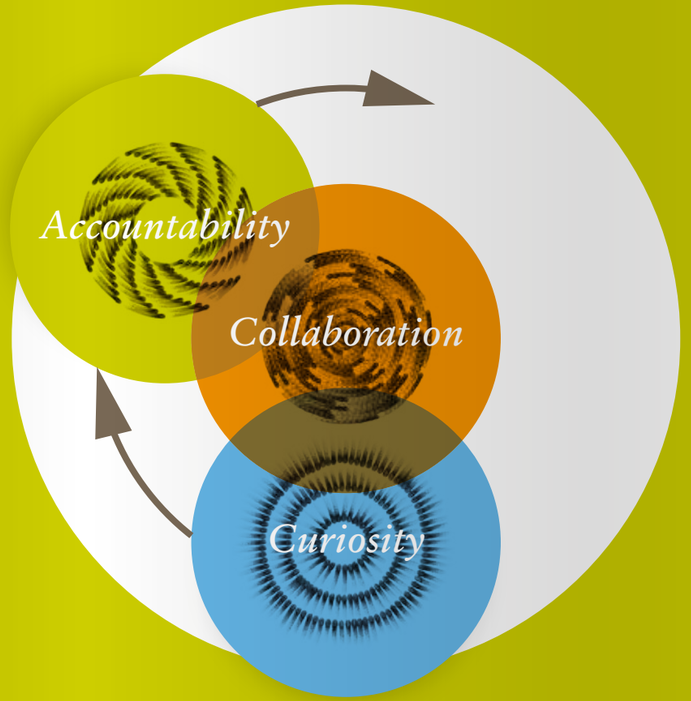
At Yara, together we care.

Together we care through collaboration,
by working as a team and being ***committed to our safety culture****, we become better in the important task of caring for ourselves, for Yara and for the planet.*

Together we care through curiosity,
the only way to ***identify hazards and reduce the risks*** *we face,* ***is to understand them*** *in a proactive manner, in order to be increasingly better prepared.*

Together we care through accountability,

We are aware of the importance ***handling risks*** *has for our safety and the safety of our colleagues and neighbors.*

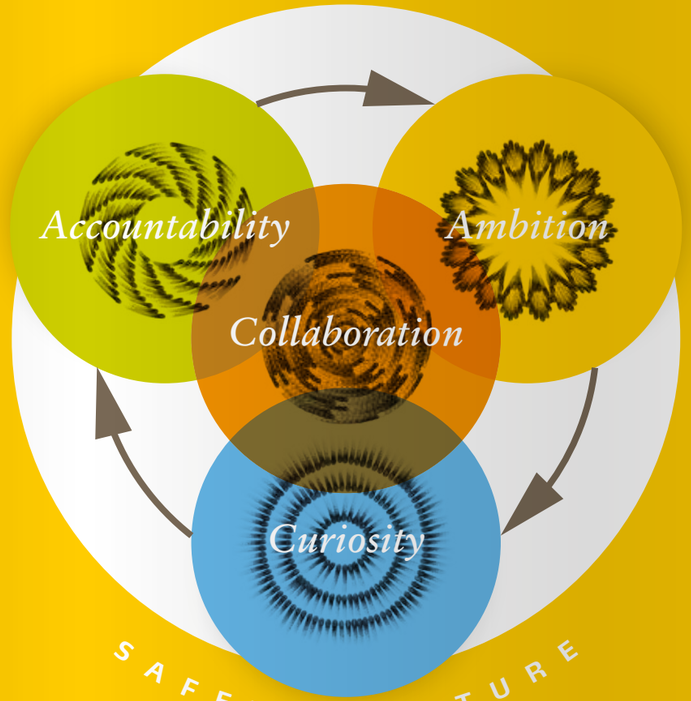


Together we care through ambition,

We must go beyond boundaries and

***learn from our experience** in order to*

become better and safer.



This is the **Process Safety Management** manual. Here, you will understand what it is, how it works, and how it connects with our values, our safety culture –**Safe by Choice**– and your daily work.

Welcome!

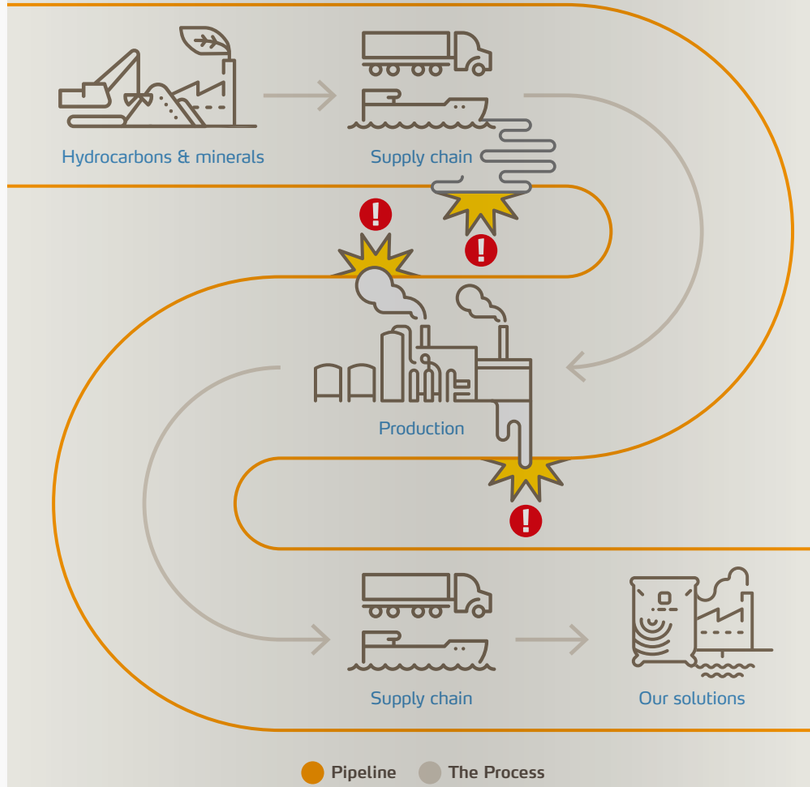
What is Process Safety Management?

*In simple words, Process Safety Management is responsible for "**keeping the process within the pipe**", whereas by process we make reference to fluids, gases, mixtures and other **materials** that may be **dangerous**; and by* **pipe**, *we refer to **primary containment** of such materials through different equipment like containers, reactors, tanks, etc.*

Despite appearing simple, it is a task that requires a lot of accountability,
If **hazardous materials** are released involuntarily from their **primary containment**, they automatically become a significant risk for society, the environment and to us. Ultimately, it could mean the loss of our operating license.

For this, the Process Safety Management focuses on three key factors:

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



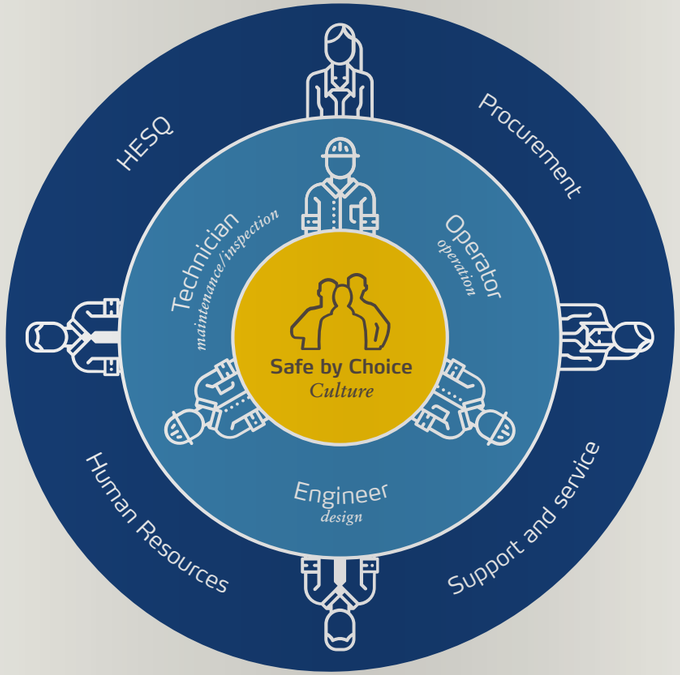
How does Process Safety Management connect with Safe by Choice?

As we know, Safe by Choice is our journey towards a better safety performance within Yara, with our stakeholders and society in general.

Safe by Choice, has two key components:

1. **Occupational safety,** which results in safer **behavior** at work and a safer workplace.
2. **Processes safety**, which results in a safer industrial process from **design, operation and maintenance**, and this is where **Process Safety Management** comes in!

In order to make our **Safe by Choice** journey a reality, we need to know and use our existing safety tools with even higher quality, appropriation, commitment and consistency than we have until today, and the **Process Safety Management** helps us prevent the involuntary leak of hazardous materials in a better way in order to contribute to our safety journey towards zero injury.



How do our values link with our Process Safety Management?

*Yara's **Process Safety Management** focuses on risk and has 4 foundation directly linked with our **4 corporate values**, all of them under the premise: **Together we care.***

Together we care:

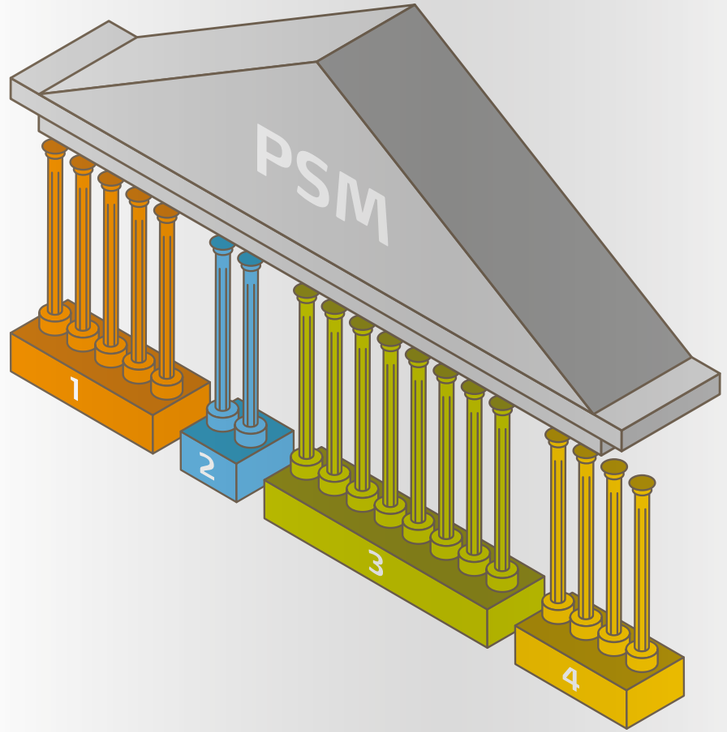
1. **Committing ourselves to the Process Safety Management** through **Collaboration.**
2. **Understanding hazards and risks** through **Curiosity.**
3. **Handling risk** through **Accountability.**
4. **Learning from experience** through **Ambition.**

1 *Collaboration:* Commit to Process safety

2 *Curiosity* Understand Hazards and Risk

3 *Accountability* Manage Risk

4 *Ambition* Learn from Experience



1

Committing ourselves to the Process Safety Management *through Collaboration.*

*Committing ourselves to the **Process Safety Management** is to **collaborate with each other**, work together and understand that each one of us is an important part for the efficient performance of safety at Yara. It is guaranteeing that each one of us does what is right at the right moment, through these 3 steps:*

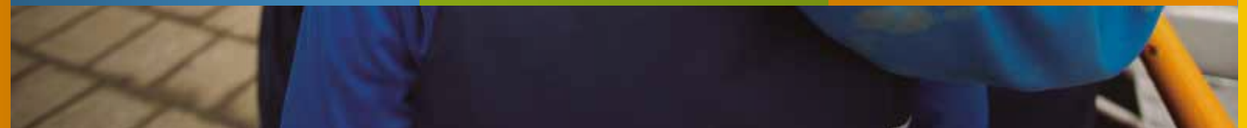
1. Being aware of the rules.
2. Having the specific competences according to our role.
3. Actively contributing to the process.

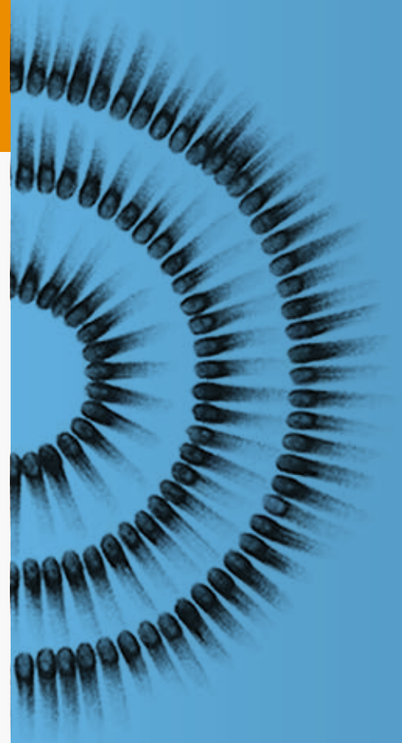
On the other hand, committing ourselves to the **Process Safety Management** is **Collaboration** with our environment. It's being aware that our operations may impact our neighbors and that by being responsible for our own safety; we are being responsible for their safety as well.

1. Being aware of the rules.

2. Having the specific competences according to our role.

3.Actively contributing to the process.





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Understanding hazards and risks

through Curiosity.

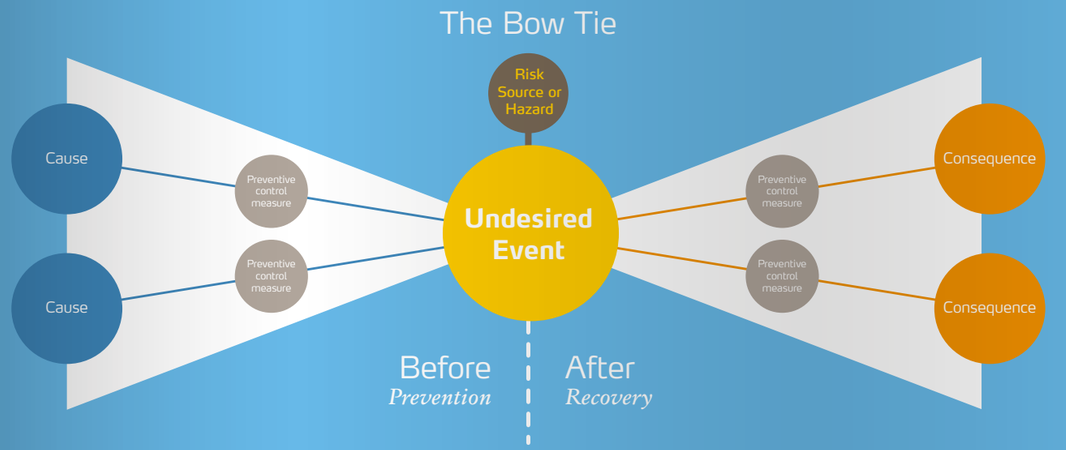
***Understanding hazards and risks** through **Curiosity**, the desire of researching them, identifying them, defining them and analyzing them with quality and consistency for being more effective. It's making growing our knowledge, and due to this, it is the most important foundation of the **Process Safety Management**.*

First of all, let's understand the differences between **Hazard** and **risk**:

- **Hazard** refers to substance properties or process conditions with the potential of causing harm.
- **Risk** is defined as a combination between severity of consequences and the probability of it happening.

Understanding hazards and risk starts with collecting relevant information on process safety followed by a systematic brainstorming process, where we use formal risk assessment tools, technically known as **HAZard IDentification** and **HAZard OPerability** (HAZID and HAZOP).

Finally, we formalize the risk assessment conclusion in a "bow tie diagram", which is the way in which we can visualize the results of this pillar for teaching/communicating/managing risks in an effective manner, as we will see in the following foundation.



3

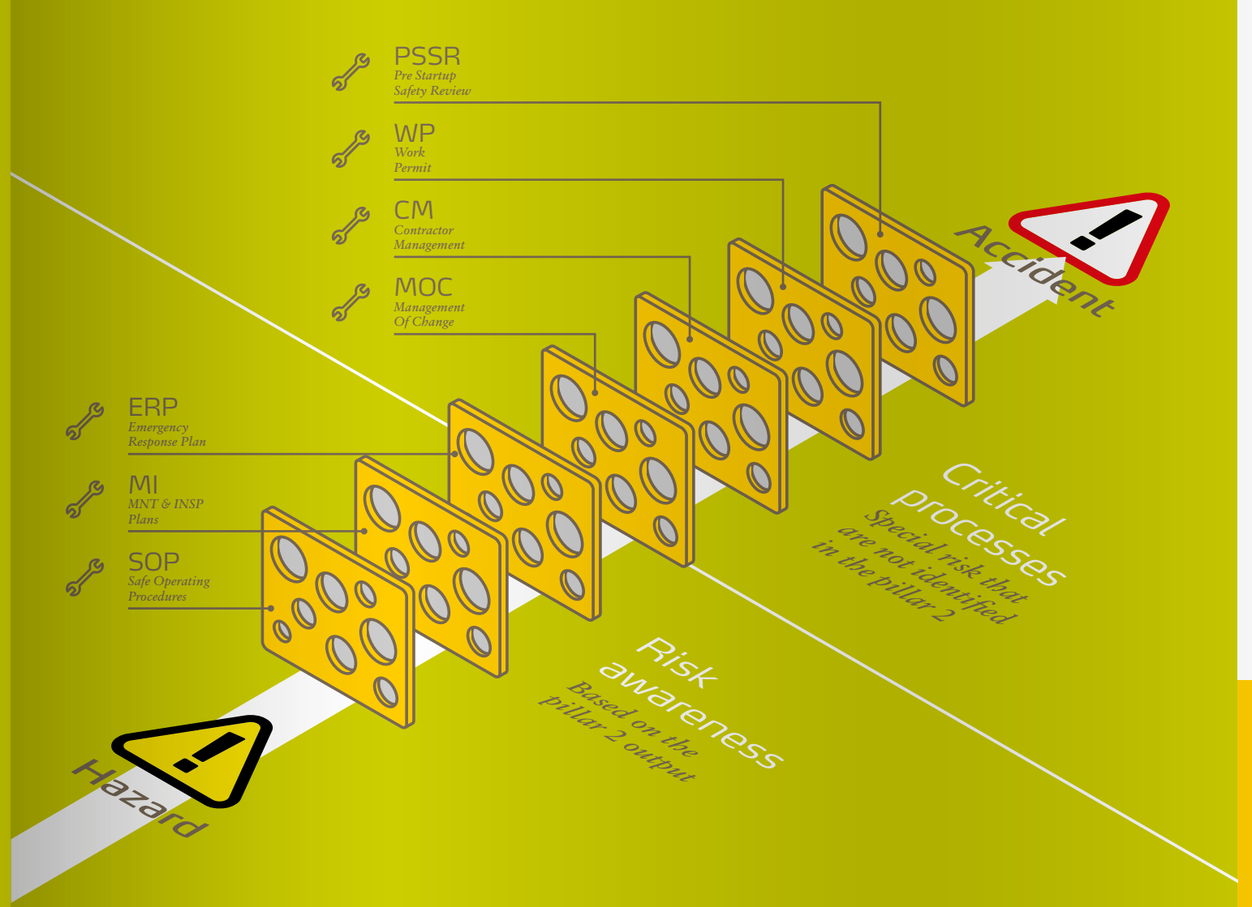
Managing risk
through Accountability.

***Handling risk** through **accountability** is understanding that once we have identified hazards, risk scenarios and associated safety barriers, we are all now responsible to consistently apply with quality this agreed ways of working.*

Management begins with an appropriate risk awareness, in order to ensure that relevant information is duly communicated to all key personnel within Yara (Operators, maintenance and inspection technicians, and teams responsible for emergencies)

Then, based on our industrial experience, we must be conscious that chemical processes increase their exposure to risk when:

1. There is a modification (in our process operation or equipment) that may affect our agreed ways of managing risks.
2. Operations are in an unstable transitory phase, mainly in their startup, where the process requires specific attention.
3. Critical tasks are delegated to third parties, where we must ensure that the contractors in charge are sufficiently competent.
4. Non-routine activities are carried out where a specific risk assessment is needed.



In order to handle exposure to risks, we have critical safety processes like: Management Of Change, Contractor Management, Work Permits and Pre Startup Safety Reviews.

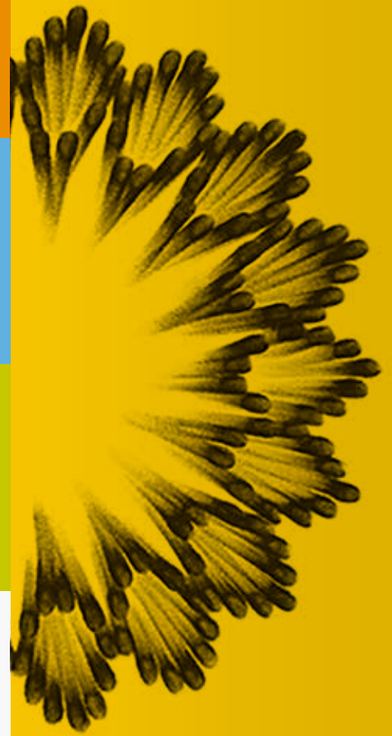
In addition, through formal training programs, we raise awareness on risk and critical safety processes that foster a proactive attitude in all members of the organization.

Lastly, an active monitoring, routine checks, audits and the dedicated systematic inspection program ensure control and a high operational discipline, thus proving the leadership that has always characterized Yara.

Managing risk through accountability is everyone's commitment working to agreed standards, choosing not to accept any deviations, and working in a way that consistently delivers a high level of quality.

Training Program

Operational Discipline



4

Learning from experience *through Ambition.*

*Finally, **learning from experience** through **Ambition**; it is knowing that a preventive approach will only take us to a certain point in our safety journey, and that in order to go beyond, we must be always checking how to improve our current performance, preserving our sense of vulnerability.*

Valuable learning can be achieved proactively from the results of audits and systematic inspection programs, and also from the results of events investigations focusing on severe potential consequence.

Moreover, we can only improve what we measure, that is why we record and use data in Synergi to help us improve quality and compliance to the Process Safety Management system.

All of this is routinely analyzed throughout all levels of the organization by a safety committee through process safety performance dashboards. This is how we ensure that we always drive forward the continuous improvement in our safety management system.

1. Audits and systematic inspection programs.

2. Improve what we measure.

3. Routine analysis by a safety committee

How can we improve the process safety performance?

Accidents in the process are rare and can cause grave consequences, therefore, detecting failures and hazardous conditions as soon as possible, is key to avoiding accidents.

Everyone's contribution is vital, so here you will find an example to learn how to detect safety incidents in the process, and thus actively contribute to **Process Safety Management**.

Hazardous condition

When insulation sheetings are in bad condition, Corrosion Under Insulation can take place.

Near Miss

When Corrosion Under Insulation is not prevented and significant/unacceptable loss of thickness is detected.

Accident

When corrosion under Insulation is not detected and the process escaped from the pipe!


safe
BY CHOICE