



# MOOC

## Management and leadership for safety

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### INTRODUCTION



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This MOOC focuses on management and leadership for safety as a process unfolding within an industrial organization where many hazards may be present. Herein, safety can be defined as a state in which the occurrence of an event leading to serious consequences and harmful effects for people and / or the environment is unlikely.

In complex and “high risk” industrial organizations such as nuclear power plants, or chemical plants, safety is mainly based on “safety barriers” and a set of safety features (e.g., redundancy of equipment, preventive maintenance, reporting systems) in such a way that, if operated within its design limits and in line with prescribed procedures, severe accidents would essentially be eliminated. However, this kind of safety, also called “regulated safety”, is somewhat idealistic, and insufficient, because of the difficulty to factor in all uncertainties.

Research on high reliability organizations and on resilience mechanisms has shown that the intensive development of regulated safety, designed to increase reliability, can blunt the capacity of both operators and managers to respond appropriately in the case of unknown situations (i.e., any situation unforeseen by the regulated safety system). It can therefore reduce resilience, another important safety performance component.

This significant gap in addressing safety issues has also been identified by the expert community driving the international nuclear safety standards system.

Indeed, it is now well recognized that managers are also expected to lead their team members in facing uncertain and unplanned situations, thus adding a dimension of “managed safety” to their role in implementing “regulated safety”.

This is what the expression “leadership for safety” refers to. However, while such a leadership role of managers is identified as important and salient, how managers can learn to practice it effectively remains a key challenge. The ELSE (European Leadership for Safety Education) Project seeks to address this challenge

(<https://univ-cotedazur.eu/european-leadership-for-safety-education>).

The ELSE Project has defined “leadership for safety” as “a process of influencing behavior so it meets the expectations of safety management”. The ELSE pedagogical approach to leadership for safety education aims to provide managers, either in industries or in regulatory organizations, with relevant knowledge enabling them to develop both their capabilities as safety managers and their legitimacy as safety leaders.

As the process of influence is embedded in an organizational context, the ability to exercise this process of leadership depends on the understanding of:

- The expectations of safety management
- The organizational dynamics
- The process of influence itself (e.g., the leadership process).

This MOOC will help you to better understand these three themes of safety management, organizational dynamics, and leadership, that contribute to the development and implementation of effective safety leadership.

## MOOC Content

The MOOC content was developed by an international team of renowned academics and nuclear sector experts, based on the ELSE International Scientific Workshop. This workshop took place in Nice on January 22-24, 2020. The ELSE scientific workshop report is available on the ELSE website.

This workshop allowed to identify the key concepts and challenges of each theme. Key concepts and challenges are detailed in the following table:

## MOOC Content Table

<p>Safety Management</p>	<p>1.1 : Current approaches</p> <p>Key concepts</p> <ul style="list-style-type: none"> <li>- Managing Safety: an evolving problematic</li> <li>- Risks and Safety: a technical approach</li> <li>- Safety culture</li> <li>- International safety standards</li> </ul>	<p>1.2: Dealing with uncertainty</p> <p>Key challenges</p> <ul style="list-style-type: none"> <li>- Building high reliability organizations: from anticipation to resilience</li> <li>- Dealing with uncertainty in a collective manner: collective cognition</li> <li>- Individual factors of dealing with uncertainty</li> </ul>
<p>Organizational Dynamics &amp; Leadership</p>	<p>2.1 : Organizational dynamics</p> <p>Key concepts</p> <ul style="list-style-type: none"> <li>- Organizational structure and design</li> <li>- Fostering learning in organizations: knowledge and learning</li> </ul> <p>Key challenges</p> <ul style="list-style-type: none"> <li>- Management of paradoxes</li> <li>- Uncertainty, complexity, and organizational limits - implications for safety</li> </ul>	<p>2.2: Leadership as a process of influence</p> <p>Key concept</p> <ul style="list-style-type: none"> <li>- Leadership</li> </ul> <p>Key challenges</p> <ul style="list-style-type: none"> <li>- Ethics and Risks Management</li> <li>- Leadership for safety in day-to-day practices</li> </ul>

## MOOC Architecture

The MOOC "Management and Leadership for safety" is composed of 4 units. Units 1&2 introduce the key concepts; units 3&4 the key challenges.

To facilitate the learning of the notions developed in this MOOC, it is important to follow the units in the order proposed. The three themes are approached in a combined way in order to guarantee overall consistency. For example, the concept of organizational structure and design (key concept of the Organizational dynamics) is presented before that of safety culture (key concept of Safety Management: current approach), because culture is a sub-part of the organization.

The following table details the key concepts studied in Units 1 and 2:

Unit 1	Management and Leadership for Safety: Key Concepts - part 1
1	Managing safety: an evolving problematic
2	Risks and Safety: a technical approach
3	Organizational structure and design
Unit 2	Management and Leadership for Safety: Key Concepts - part 2
1	Safety culture
2	Leadership
3	Fostering learning in organizations: knowledge and learning
4	International safety standards

The following table details the key challenges studied in Units 3 and 4:

Unit 3	Management and Leadership for Safety: Key Challenges - part 1
1	Management of paradoxes
2	Ethics and Risks Management
3	Building high reliability organizations: from anticipation to resilience
Unit 4	Management and Leadership for Safety: Key Challenges - part 2
1	Dealing with uncertainty in a collective manner: collective cognition
2	Individual factors of dealing with uncertainty
3	Uncertainty, complexity, and organizational limits - implications for safety
4	Leadership for safety in day-to-day practices