



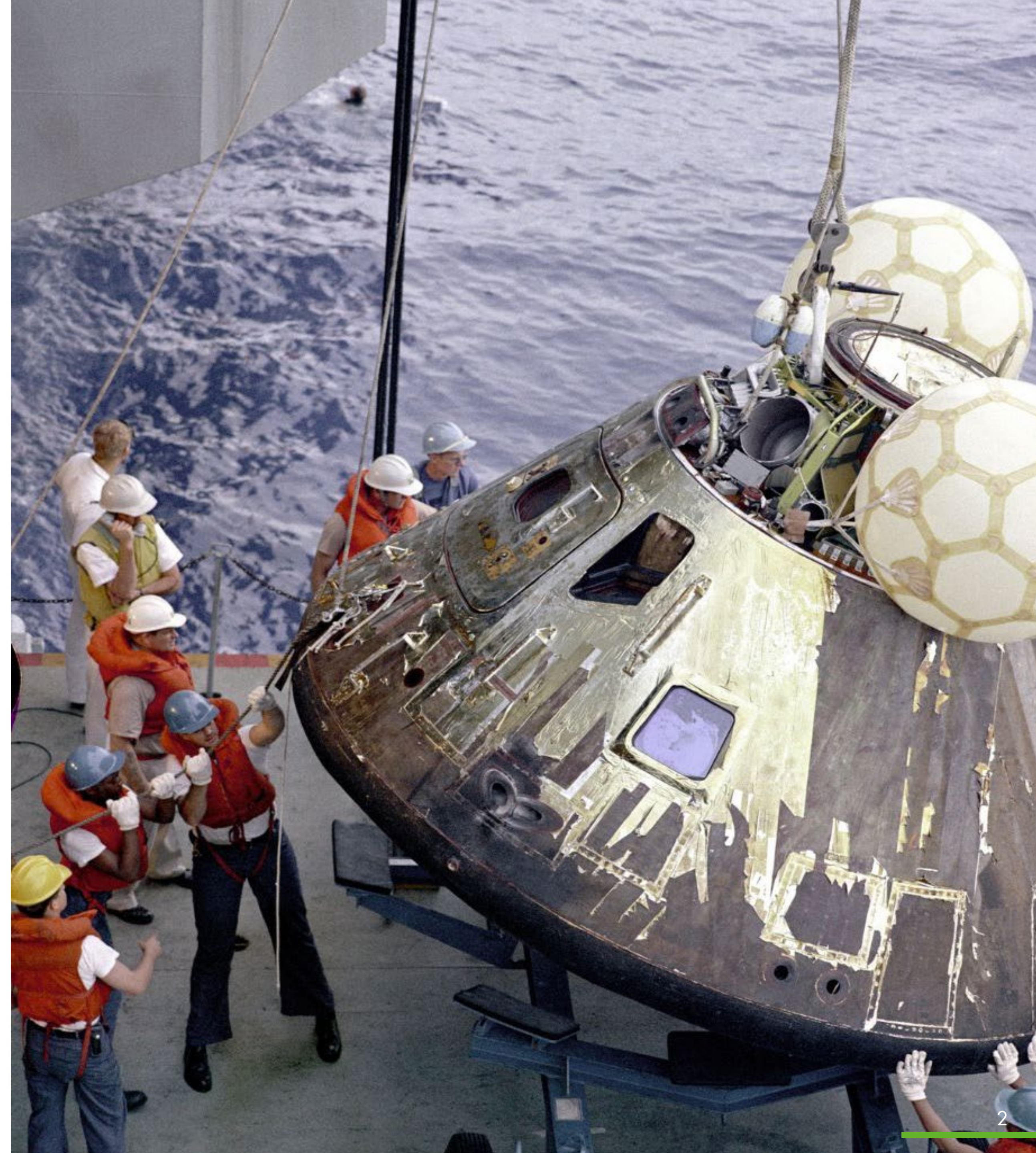
**Human Factors in
Emergency Situations:**

Care enhances **decision making**
and **reliability**

Whitepaper DEKRA Organisational Process Safety

Emergency situations are unexpected, time-sensitive events that require immediate action and pose a significant risk to individuals, job, and the organisation. When faced with emergencies, effective decision-making and reliability become crucial factors for any organisation. Through thorough planning, clear communication, and consistent training, it is feasible to establish a more predictable reaction when emergencies arise.

Taking inspiration from the Apollo 13 mission, a prime example of efficient problem-solving and reliability in high-risk situations can be observed through the team's exceptional preparedness which played a crucial role in successfully navigating the crisis. The Apollo 13 mission highlights the importance of rigorous training and effective decision-making processes. The astronauts and Control Room teams involved in the mission were trained to correctly perform tasks and make critical decisions swiftly. Their success in returning to Earth safely was a statement of their preparedness and adaptability when confronted with an unprecedented crisis.



**Decreasing Cognitive Effort
Decreasing Effects of Stress**



Creative

Choice

Rule-based

RPD

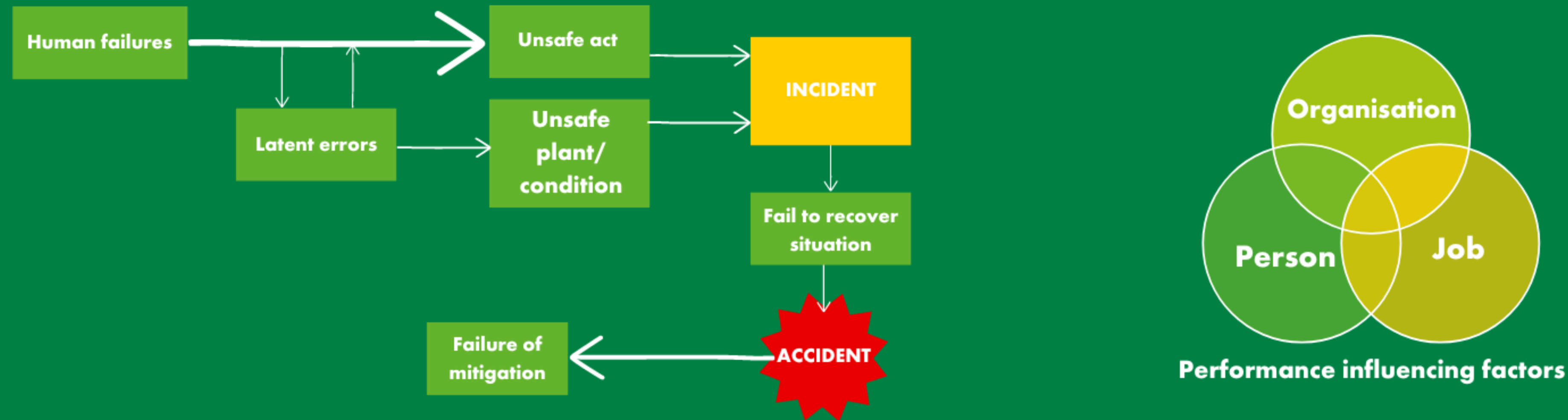


**Increasing Cognitive Effort
Increasing Effects of Stress**

Decision Making Framework

There are several ways of accomplishing predictable and reliable decision making, one of these is to firstly understand how different decisions are made through a well-structured framework. Recognition Primed Decision Making (RPD) is an approach that heavily relies on the decision maker's previous experiences stored in their memory. This process requires minimal thinking and mostly operates in the decision maker's unconscious mind, where they can match patterns or sequences of events from past situations to the current action, enabling quick decision-making. Understanding RPD is a key factor as it represents the decision-making type often adopted when unexpected events occur and require urgent action, such as an

explosion or leak at a plant. Organisations carry the responsibility of ensuring that the workforce is properly trained and possesses the necessary competency. Therefore, offering training for the technical side of the job, for responses in cases of emergency, and adopting an in-depth understanding of potential major accident hazards among staff is key in preventing catastrophic outcomes and ensuring safe decision-making during unexpected, high-risk events. DEKRA offers comprehensive [COMAH/Seveso compliance services](#) that can help companies achieve these safety goals. By having a strong understanding and training in terms of emergency situations, even when events arise, the workforce can draw their knowledge and experience



The accident model

An incident that highlights the importance of decision-making processes, as well as creating a culture of reliability and predictability is the Esso Longford gas explosion. The disaster resulted in the loss of two lives, eight injuries, and a significant gas supply disruption. According to Hopkins, 2001, one of the causes of the disaster was inadequate preparedness and training, accompanied by Esso's failure to conduct a hazard identification procedure, commonly referred to as **HAZOP** (hazard and operability study). The **HAZOP analysis** is one of the most popular hazard analysis techniques. It focuses on imagining credible scenarios with the potential to cause an incident in systems such as processing plants, transportation and even traffic management systems. It assesses if suitable measures are in place to prevent and control that risk. DEKRA offers expert leadership of hazard analysis studies (including **HAZOP**) and training in these techniques to help organisations identify and manage risks associated with complex processes. By using DEKRA's expertise, organisations can benefit from a systematic, thorough, and structured approach to risk assessment and management, ensuring a safer working environment and minimising the likelihood of catastrophic incidents like the Esso Longford gas explosion.

The Esso incident showcases the significance of fostering a culture of safety and risk awareness, by ensuring that the workforce is equipped to handle unexpected situations by making an informed, recognition-primed decision. DEKRA, a trusted advisor in questions of safety culture, offers a **Culture of Care Diagnostic**, and develops an individualised safety strategy, providing a tailor-made solution based on each organisation's needs. This approach helps in minimising the impact of disasters that may result from active failures or latent conditions, leading to human error or violations. Latent conditions played a major role in the Esso Longford incident, as equipment design, system implementation and supervisory performance were all impacted by variables such as managerial influences and organisational culture. In most cases, the latent conditions remain hidden until an unforeseen event occurs. When a number of latent conditions interact in an unpredictable manner, they can lead to latent failures. In most cases, the core problem of the disastrous accident is the way the human brain operates and processes information, which comes from sources like training, design of equipment and procedures.

Adopting a different approach regarding emergency response allows a more directive and finite decision-making process, as seen in the gold, silver, and bronze strategy used by emergency services, focusing on establishing a concise framework and operational clarity for handling incidents. This method ensures a disciplined approach rather than instinctively reacting to events as they happen. The gold level is established by senior leaders making critical and safe decisions and setting overall goals, followed by the silver level comprised of middle management that has the responsibility of coordinating resources, as well as acting as a point of communication between the gold and bronze levels. The bronze level is made up of the operational team that works on site to execute tactical plans and quickly respond to emergencies. By incorporating the gold, silver, and bronze strategy in emergency responses, organisations can improve their ability of handling crisis situations efficiently. Thus, the framework leads to a reduction of risks, enhancing safety and creating a more resilient workforce capable of managing complex situations with competence.

Besides adopting the appropriate framework, the manner in which information is transmitted serves a crucial function as the brain's capacity to process information is limited. The limitation emphasises the importance of effective communication, especially during emergency situations. By delivering information in small, easy-to-understand, and digestible chunks, the process of comprehending and retaining the information is eased. Therefore, multichannel training techniques encompass the importance of providing information in written, verbal, and auditory formats, covering a range of different learning styles. Providing clear and straightforward information, accompanied with consistent training and simulations on how to react in critical situations, human factors such as fatigue and stress, or other factors can be mitigated.





Navigating emergency situations requires a combination of effective decision-making, reliability, predictability, and a well-trained workforce. Taking examples such as the Apollo 13 mission and the Esso Longford gas explosion demonstrates that meticulous training, a culture focused on safety, and a deep understanding of potential hazards are pivotal in suppressing catastrophic aftermaths. Understanding a methodical decision making framework such as Recognition Primed Decision Making (RPD) and the gold, silver, and bronze strategy can strengthen an organisation's competence to effectively respond to crises. Additionally, pinpointing the constraints of

the human brain and optimising communication by delivering information in small chunks helps mitigate the impact of human factors. Organisations that adhere to these principles, invest in their workforce's abilities, and promote a culture of safety and risk comprehension are better equipped in handling dangerous events. By focusing on predictability and reliability, resilience can be enhanced, ultimately reducing risks, and ensuring the safety of employees. By focusing on the importance of care, we can foster predictability and reliability, which in turn strengthens resilience, ultimately reducing risks and ensure the safety of employees.

DEKRA Organisational & Process Safety

DEKRA Organisational and Process Safety are a behavioral change and process safety consultancy company. Working in collaboration with our clients, our approach is to assess the process safety and influence the safety culture with the aim of making a difference.

In terms of behavioral change, we deliver the skills, methods, and motivation to change leadership attitudes, behaviors, and decision-making among employees. Supporting our clients in creating a culture of care and measurable sustainable improvement of safety outcomes is our goal.

The breadth and depth of expertise in process safety makes us globally recognised specialists and trusted advisors. We help our clients understand and evaluate their risks, and we work together to develop pragmatic solutions. Our value-adding and practical approach integrate specialist process safety management, engineering, and testing. We seek to educate and grow client competence in order to provide sustainable performance improvement. Partnering with our clients, we combine technical expertise with a passion for life preservation, harm reduction and asset protection.

We are a service unit of DEKRA SE, a global leader in safety since 1925 with over 45,000 employees in 60 countries and five continents. As a part of the world's leading expert organisation DEKRA, we are the global partner for a safe world.

We have offices throughout North America, Europe, and Asia.

For more information, visit www.dekra-uk.co.uk/en/dekra-organisational-and-process-safety/

To contact us: dekra-ops.uk@dekra.com

To contact us: +44 (0) 23 8076 0722