

The background of the entire page is a photograph of a male industrial worker. He is wearing a white hard hat, safety glasses, a dark blue long-sleeved shirt, and a bright orange high-visibility safety vest with reflective silver stripes. He is focused on his work, leaning over a piece of industrial machinery. The background is filled with various mechanical parts and tools, slightly out of focus. On the left side, there is a large green graphic element that tapers from the top left towards the bottom right, containing the text for the e-book.

E-book  
**Brain-Centred  
Performance:**  
Understanding How the  
Brain Works, So We Can  
Work More Safely

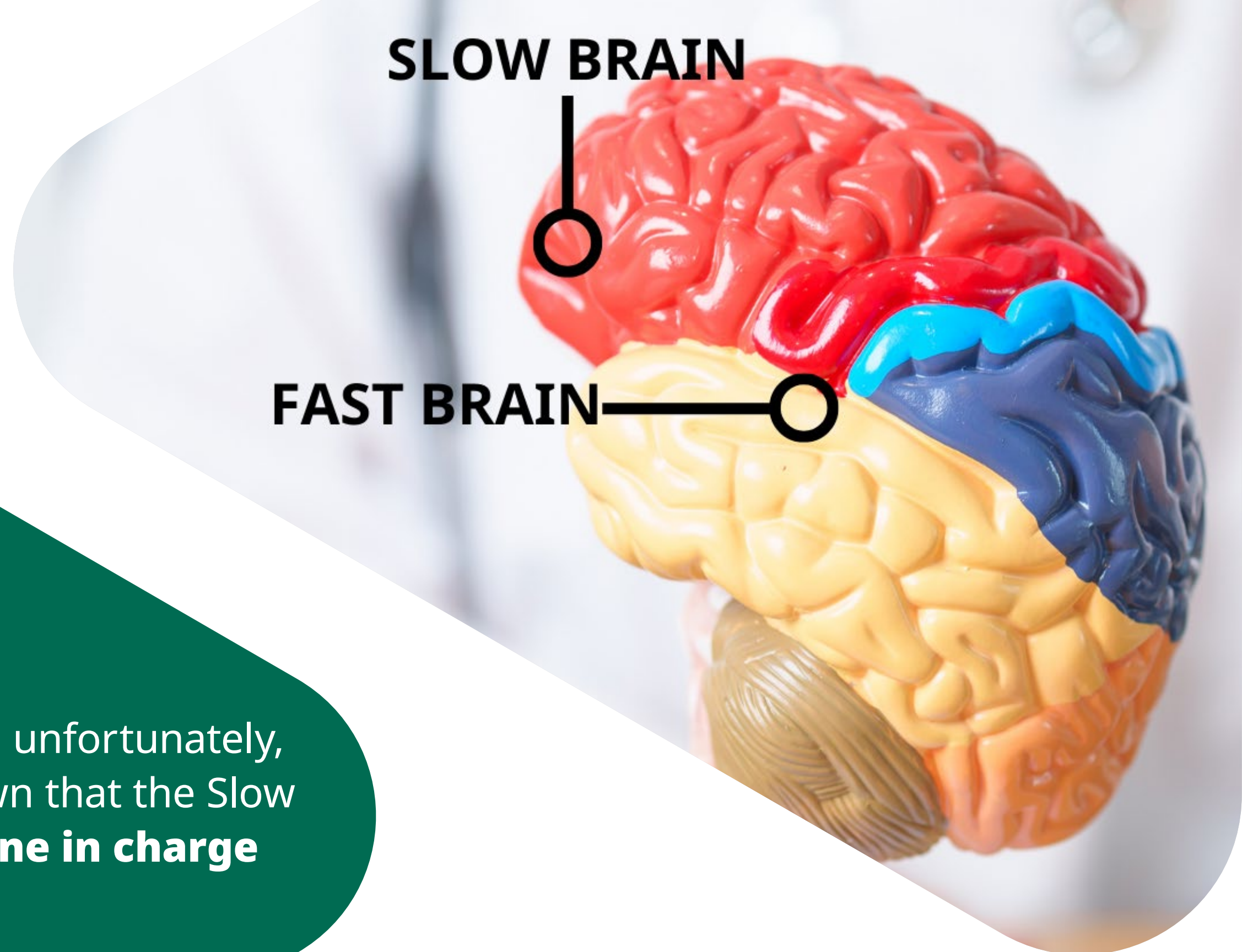


The missing key to unlocking sustained performance **reliability** and **safety** comes from **within the human brain**

**The Human Brain.**  
**The next frontier in workplace safety.**

Through improved education, technology, and data analysis, safety leaders have become increasingly adept at recognising and controlling external hazards and exposures related to people, processes, and materials. What we are beginning to understand, however, is that these capacities are not sufficient for driving operational excellence or sustained reductions in significant injuries and fatalities. The missing key to unlocking sustained performance reliability and safety comes from within the human brain. The overarching “human error” hazard can only be effectively controlled by aligning existing organisational culture, structures, and procedures with the functional realities and limitations of the human brain; that is, by making our organisational systems brain-aligned. The ground-breaking studies underpinning the Brain-Centric Reliability™ System have uncovered revolutionary insights into human performance, have forced a reexamination of how accidents and exposures originate, are classified and addressed, and have begun to fundamentally change the way we design, lead, and work.





**SLOW BRAIN**

**FAST BRAIN**

**Surprisingly**, and unfortunately, research has shown that the Slow Brain is **not the one in charge** much of the time.

### So who's running the show?

**It may not be what you think (or want).**

As a leader, which type of organisation would you like to build?

One based on **automatic, reactive, and habitual actions (as housed in the Fast Brain)**

Or one based on **conscious, analytical, and well-reasoned actions (as housed in the Slow Brain)?**

Surprisingly, and unfortunately, research has shown that the Slow Brain is not the one in charge much of the time. In fact, an average of 45%-50% of all actions adults performed across a day, and particularly repetitive, routine ones, are controlled and executed in the Fast Brain without thinking or conscious decision-making. Analysis and decision-making take energy—and the brain leaps at the chance to conserve valuable energy by defaulting to reactive, reflexive actions based on habit. The Slow Brain actually has to be intentionally activated to spur conscious cognition—the brain state that enables analysis, accurate problem identification, reasoning, planning, and decision making.



„True performance reliability **demands** the conscious cognition that **only the Slow Brain** can provide.“

## Action without conscious cognition

### **The hazards of operating in the Fast Brain.**

Neuroscientists have confirmed that many of our actions come from the Fast Brain. What does this actually mean to us in terms of operational reliability and safety?

### **The Fast Brain reacts without thinking.**

When adults engage in routine actions—driving a car, navigating a crowded sidewalk, mowing a lawn—we tend to rely increasingly on habit and “muscle memory” to accomplish such tasks. In the workplace, this habitual, Fast Brain response to routine tasks can lead to missed steps, incomplete work and a dangerous reliance on past experiences to predict and direct current actions. That means, if the circumstances are not identical, incorrect actions will be taken.

### **The Fast Brain operates in “Sketch Mode.”**

The goal of the Fast Brain is to process visual information and deliver feedback as quickly as possible. The result is a quick, generalised “sketch” of a situation based on color, shape and movement, and an ensuing response based on habit, experience, and limited memory recall. The risk is that these generalised visual perceptions miss important changes in the work situation, including “weak signals” that might otherwise spur preventative action in a high-consequence or safety-critical work environment.

### **The Fast Brain simply operates, well, too fast.**

True performance reliability demands the conscious cognition that only the Slow Brain can provide. However, research has shown that the Slow Brain takes a full half-second to activate. The Fast Brain, by comparison, processes visual cues and reacts in 4/10 of a second—initiating responses or actions before the Slow Brain has even had a chance to weigh in.

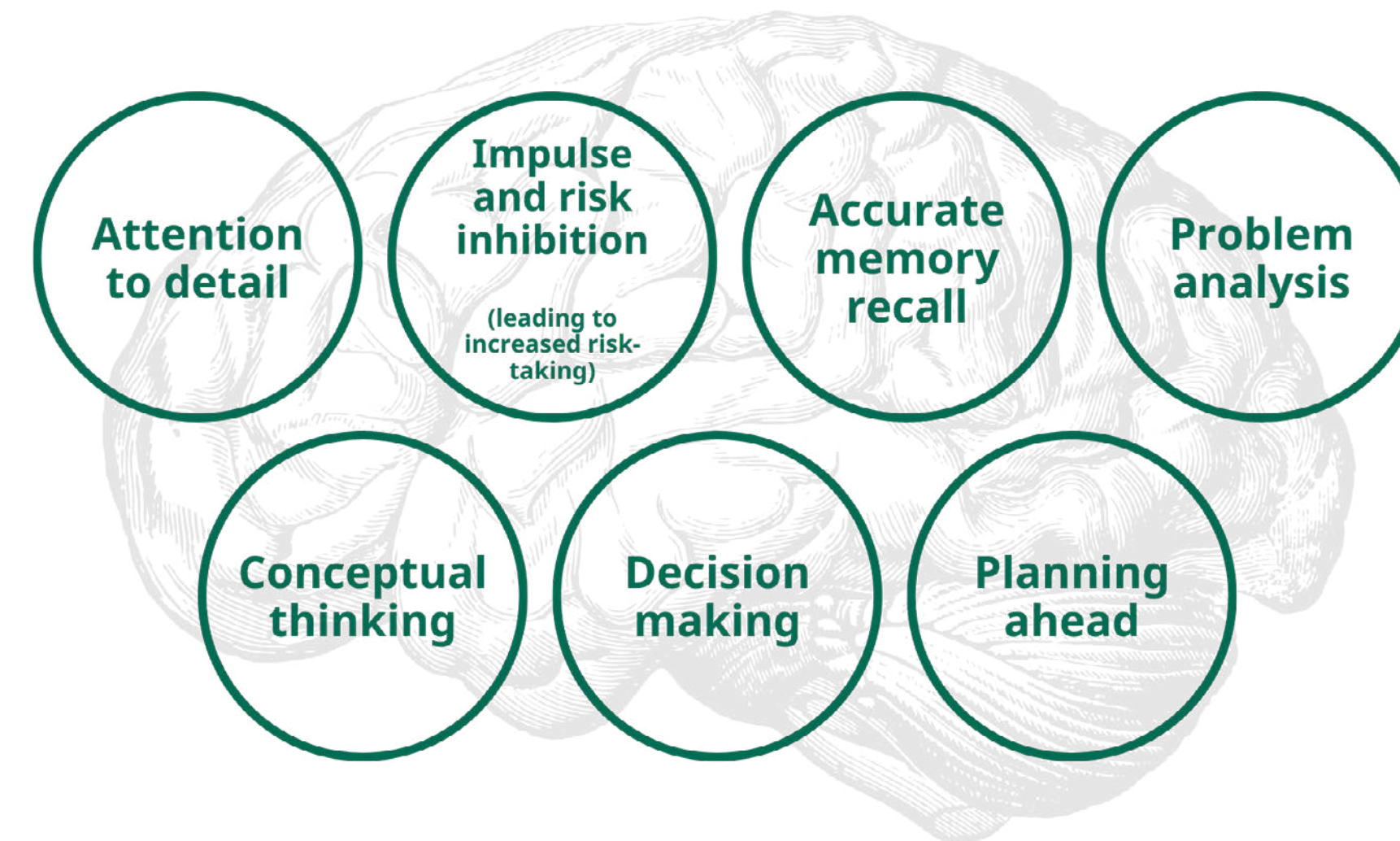


It only takes one 24-hour period of loss in **deep, delta wave sleep** for moderate to severe cognitive fatigue to occur

## Bad news for the Slow Brain

### Fatigue impairs brain performance.

Recent fMRI studies of the human brain show that insufficient delta-wave sleep impairs cognitive (thinking) capabilities. By attacking and degrading the brain's neuronal firing mechanisms, sleep deprivation and its corollary condition of cognitive (brain) fatigue have proven to dramatically impair:



And, it only takes one episode—one 24-hour period—of loss in deep, delta-wave sleep for moderate to severe cognitive fatigue to occur. In a world where each day sleep deprivation is occurring in 39% to 67% of the worldwide workforce, it is clear that this type of fatigue has emerged as a significant and dangerous challenge to human performance reliability and safety.



„Neurological research now shows that the brain is **not designed well** for modern, technology-driven operations“

## So where are we?

### And what can be done?

In many situations that demand thoughtful and reasoned action, neurological research now shows that the brain is not designed well for modern, technology-driven operations. While we cannot change the way our brains work, we can change the way that our organisations work with our brains. Our goal is to help companies implement a Brain-Centric Reliability™ System with organisational, team and individual solutions that support greater human performance reliability and improve safety and reliability outcomes. The solution?

### Optimise human performance reliability by catering to the Slow Brain.

With our new, deeper understanding of the workings of the brain, it has become clear that the way our work systems operate and the way the human brain works are not always in sync. The time has come to reexamine our systems, processes, and procedures, to isolate the newly-identified Brain-Centred Hazards, and to put in place solutions that encourage intentional actions, eliminate reflexive risk, and enable employees to respond to all operating conditions with Right-First-Time performance.



## Culture starts at the top

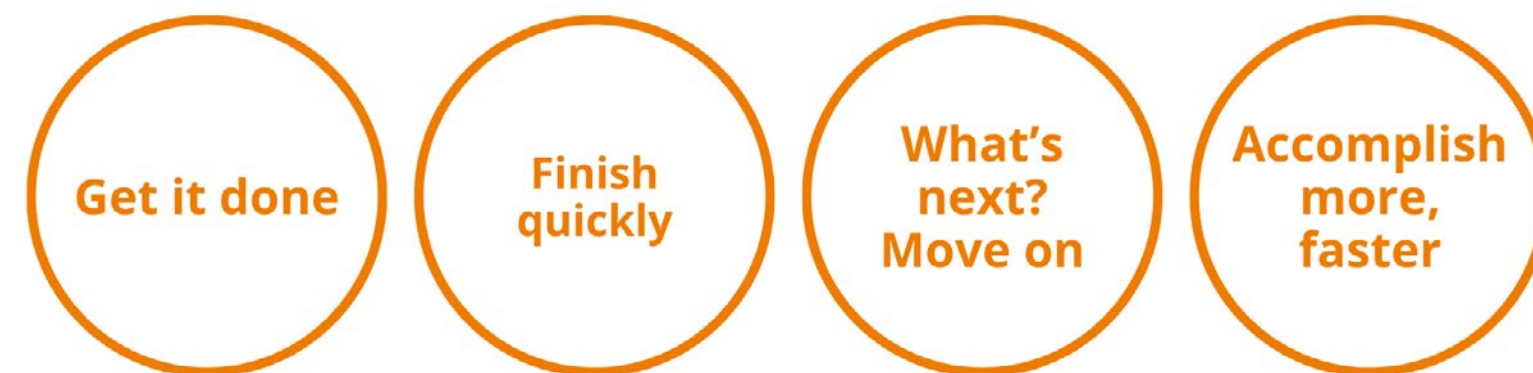
To illustrate how the Brain-Centric Reliability™ System can help you achieve these important safety goals, we have identified three sample steps for leaders to take on their path to performance reliability - The Power of Words, Procedural Ambiguity and Wake-up Call.

### The Power of Words

#### Change cultural messaging.

Culture starts at the top. Leaders create corporate cultures by sending messages to their organisations that define organisational success and set the tone for how people work.

If these messages are messages of urgency—



—leaders are inadvertently sending a signal to work from the Fast Brain only. Under time pressures, adrenaline is released and our Slow Brain is isolated, causing us to speed up and move faster, but also creating the risk that we will skip steps or miss weak signals in our hurry to complete the task at hand.

We need to reexamine our corporate cultures and leader messaging from a brain-centred perspective. Messages such as—



encourage measured, Slow-Brain responses. To build smarter, safer cultures of thoughtful, precise execution, and Right-First-Time Reliability, leaders need to consistently send the right verbal messages to the workforce.



„When the performance of crucial procedures relies on **past experience or rote memory**, the door is opened for **human error**“

## Procedural Ambiguity

### Create Brain-Aligned SOP™ Designs.

When the performance of crucial procedures relies on past experience or rote memory, the door is opened for human error. If we want error-free actions, and we must, then we have to provide the workforce with clear, concise procedures that reflect and align with the way our brains work.

Now that we know our brains often fire quickly, based on immediate responses to visual stimuli, it is critical that we eliminate confusing instructions, poor design and other opportunities for mis-cueing and misinterpretation in our written SOPs—standard operating procedures. Clearly written, well-designed, and approachable SOPs provide critical guidance and can make the difference between rock-solid performance reliability and devastating misinterpretations that result in high-consequence errors.





We can no longer turn a blind eye to the **rampant levels** of cognitive fatigue across **all levels of workforce**

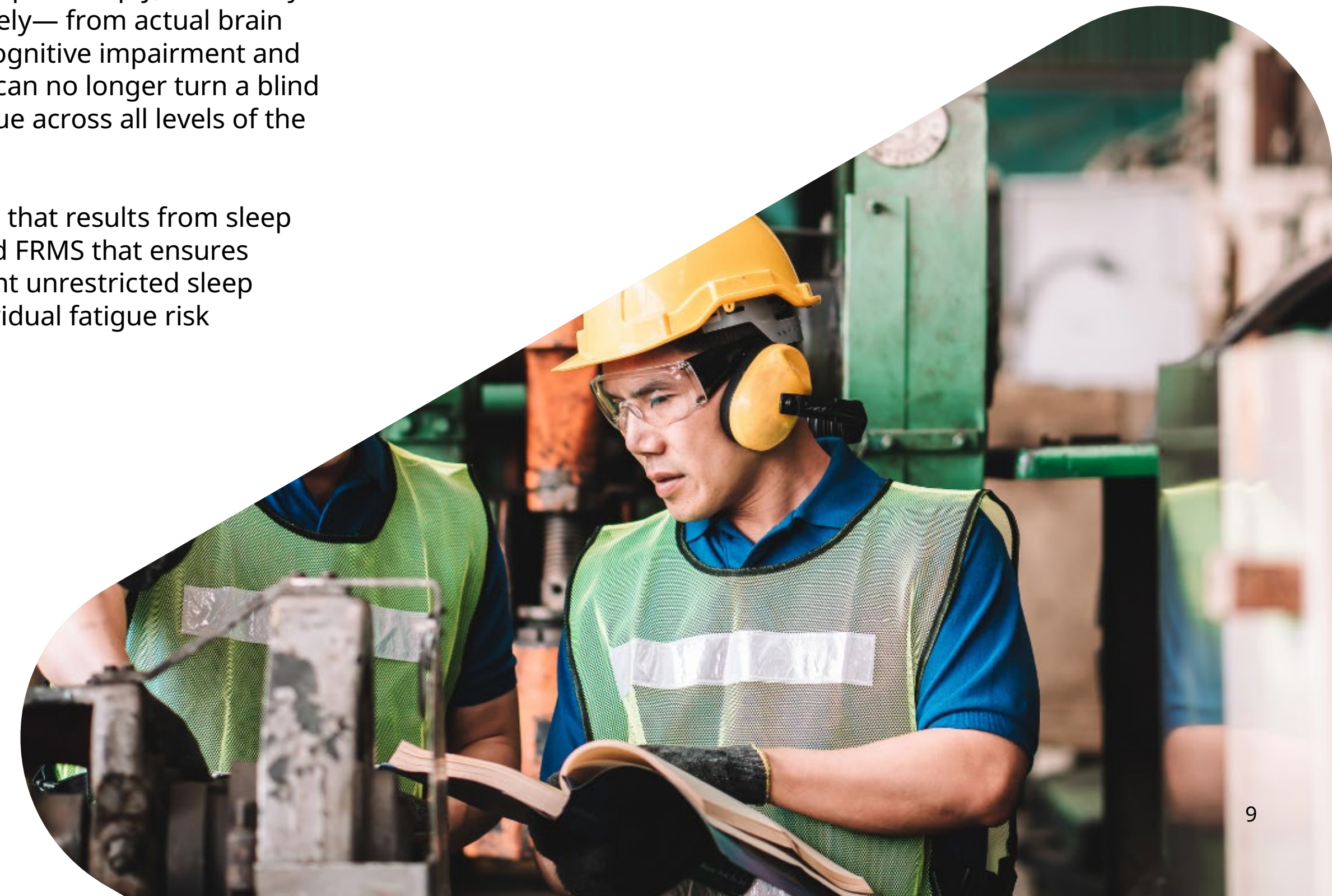
## Wake-Up Call

### Manage fatigue risks

Most organisations would do well to take a long look at all of their management systems, to determine whether they are brain-aligned. For many organisations, there also is a management system they need to add—an FRMS or Fatigue Risk Management System.

As we now know, fostering conscious cognition improves error-free performance. Conscious cognition is housed in the Slow Brain. And cognitive fatigue from sleep deprivation is, quite simply, the enemy of the Slow Brain. Now that we know definitively— from actual brain imagery—that sleep deprivation leads to cognitive impairment and severe gaps in performance capability, we can no longer turn a blind eye to the rampant levels of cognitive fatigue across all levels of the workforce.

Overcoming the Microsleep Mishap Hazard that results from sleep deprivation requires a robust, multi-faceted FRMS that ensures effective, in-depth fatigue training, sufficient unrestricted sleep opportunities, real-time and objective individual fatigue risk assessments, and much more.





**Change** is the law of life and those who look only to the **past** or **present** are certain to miss the future.

– John F. Kennedy

## Embrace the Opportunity

As we have seen, recent neuroscience research has provided brand new insights into our brains, how they function, and how they impact the way we work and our resulting safety and performance reliability. These cutting-edge insights present valuable new opportunities for leaders responsible for operational reliability as well as organisational and process safety. The solutions listed above are just a few of the actions leaders need to take. We now have the knowledge and tools to challenge existing misperceptions about human error and to mitigate or virtually eliminate those errors. We know how to better support and protect our employees in the performance of their duties, and to build safe, smart, High Performance Reliability Organisations (HighPROs) based on sustainable Brain-Centric Reliability™ principles and practices. So now this work must begin!

# DEKRA Organisational & Process Safety Contact

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 48,000 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](http://www.dekra-uk.co.uk)

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