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Organizational Safety Effectiveness Survey (OSES)

OSES AI Upgrade

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Partnership Team

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Agenda

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- Examples of Organizational Accidents
- Organizational Accidents and Human Failures
- Organizational Safety Effectiveness Survey – OSES
- OSES – AI upgrade and Operational Advances
- OSES – AI Demonstration Prototype

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Organizational Accidents

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- **Examples from Aerospace**
  - Challenger
  - Columbia
- **Examples from Aviation**
  - France 447
  - 737 Max
- **Examples from nuclear Operations**
  - Fukushima
  - 3-mile island
- **Oil and Gas Operations**
  - Macondo Oil Rig Blow Out – Gulf oil spill
  - Texas Refinery Explosion

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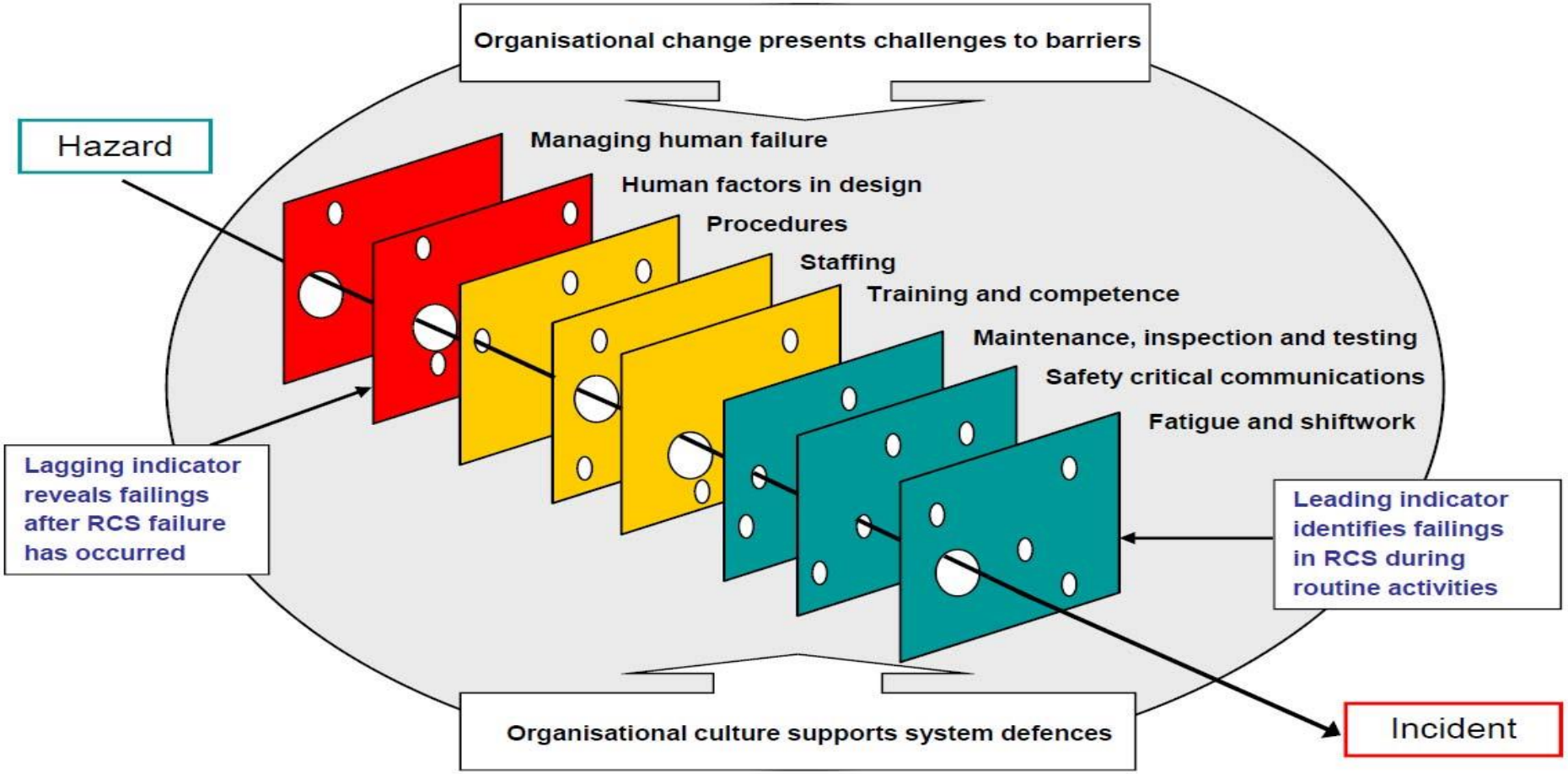
Organizational Safety

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ACCIDENT	PRECURSORS / RISK INDICATORS
Space Shuttle Challenger (1986)	Engineers' warnings ignored. Serious Risk levels were normalized Communication barriers between supervisors and technical staff
Space Shuttle Columbia (2003)	Serious Risk levels normalized Engineers' warnings ignored Failed safety review process
Air France Flight 447 (2009)	Pilot training deficit (automation) Insufficient procedural guidance
Boeing 737 Max	Production pressures Weak Safety culture Communication failures
Fukushima Daiichi Nuclear Melt Down	Poor risk assessment (underestimated) Lack of equipment & emergency prep.
Deepwater Horizon/Maondo blow out	Management ignored worker warnings Production priority over safety

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RCS Risk Control System

CCRM (2012) Deep Water Horizon Study Group UC Berkeley.

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Organizational Safety Effectiveness Survey – OSES
Safety Science Foundations

- **High Reliability Organizations** – management commitment to safety, focus on potential operational failures, distributed risk decision responsibility and action.
- **Principals of Just Safety Culture** – no blame culture, consideration of organizational and system contribution to human error.
- **Organizational Resiliency** – reduction of failure and accident risk through sound engineering and systems approach to manage risk of critical operations.
- **Safety 1 Principles** – learning from accidents and incidents, causal analysis.
- **Safety 2 Principles** – learning from successful organizational structure, safety management and and effective operational control of risk.

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ORGANIZATIONAL SAFETY EFFECTIVENESS SURVEY (OSES)

Description of the Original OSES Survey Content and Application

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Organizational Safety Effectiveness Survey *

Assessment Areas	Sample Survey Item
1. Safety Climate - Culture	• All employees feel free to report errors without fear of reprisal.
2. Safety Supervision - Management	• My supervisor sets the example for compliance with standard procedures.
3. Organizational Effectiveness	• I believe that morale is high at my Center's Aircraft Operations Organization.
4. Safety Management System	• I get all the information that I need to perform my job safely.
5. Workload and Fatigue	• I seldom feel overburdened by my daily work assignments
6. Maintenance Specific	• My Organization has an ample supply of qualified aircraft mechanics.

* Ciavarelli, A.P. (2012, September). *OSES Improvement Study for the NASA Flight Center.* Human Factors Associates.

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SAFETY MANAGEMENT SYSTEM (SMS)

SMS: FOUR COMPONENTS AND 12 ELEMENTS [1, 2]

1.0 Safety Policy and Objectives

1.1 Management Commitment
1.2 Safety Accountabilities
1.3 Emergency Response Plan

2.0 Safety Risk Management

2.1 Hazard Identification
2.2 Assessment and Mitigation

3.0 Assurance

3.1 Monitoring and Measurement
3.2 Management of Change
3.3. Continuous Improvement

4.0 Safety Promotion

4.1 Training and Education
4.2 Safety Communication

[1] ICAO. (2009). Safety management systems manual (2nd ed.) (ICAO Order No. 9859). Quebec, Montréal.
[2] ICAO. (2013). Safety management systems manual (3rd ed.) (ICAO Order No. 9859). Quebec, Montréal.

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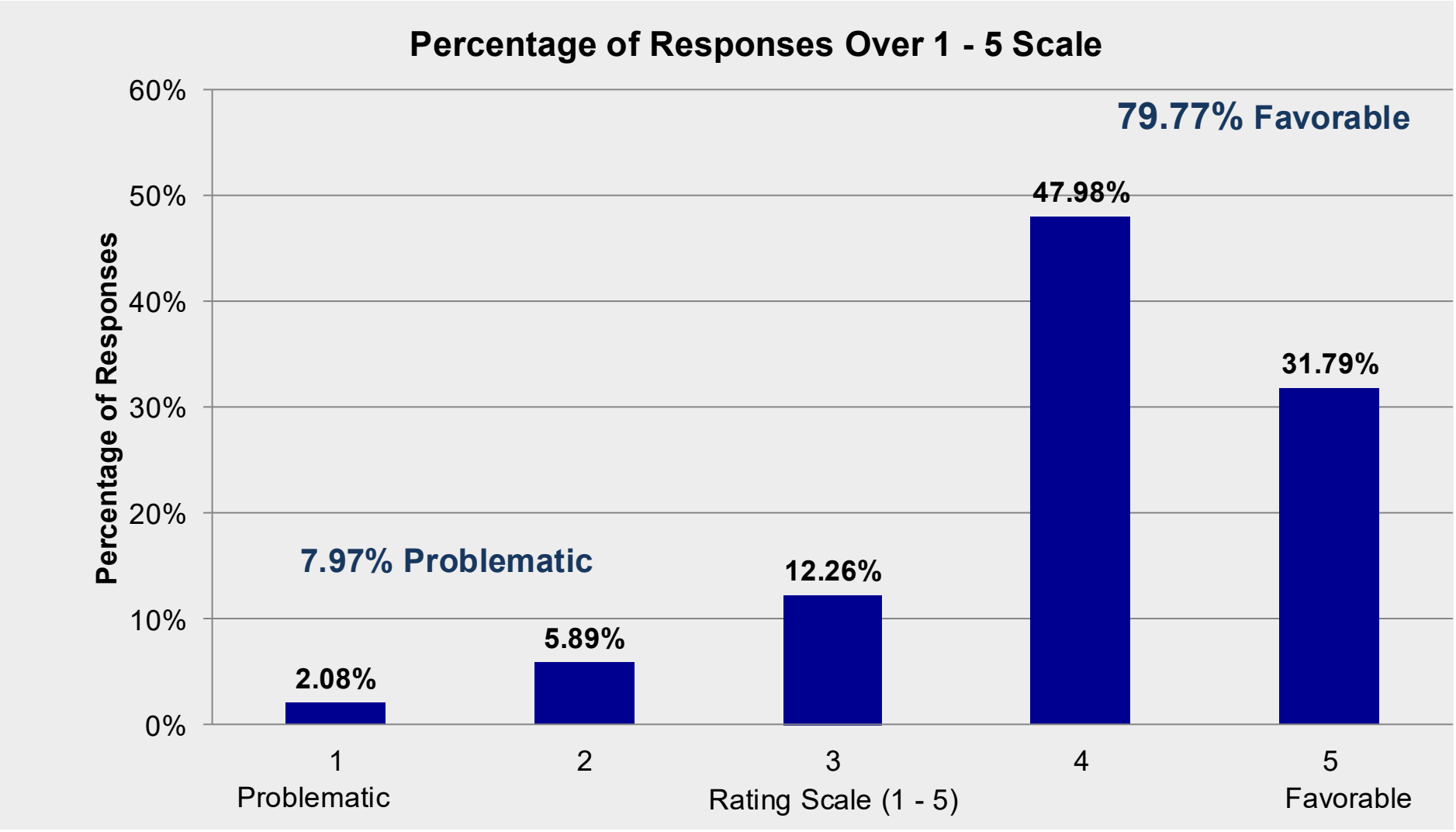
OSES Civilian Applications

- Embry Riddle Flight School (first civilian application)
- Italian Air Force
- Offshore Oil and Gas Transport (Phi, Bristow)
- Air Medical Transport (Phi, HealthNet, Allegheny Hospital life Flight)
- Electric Utility (Fortis Alberta - Canadian Company)
- Hospitals (Stanford – Harvard hospital studies)
- Commercial Aviation (Alaska, Qantas, Airnorth)
- NASA Aerospace and Flight Research Centers

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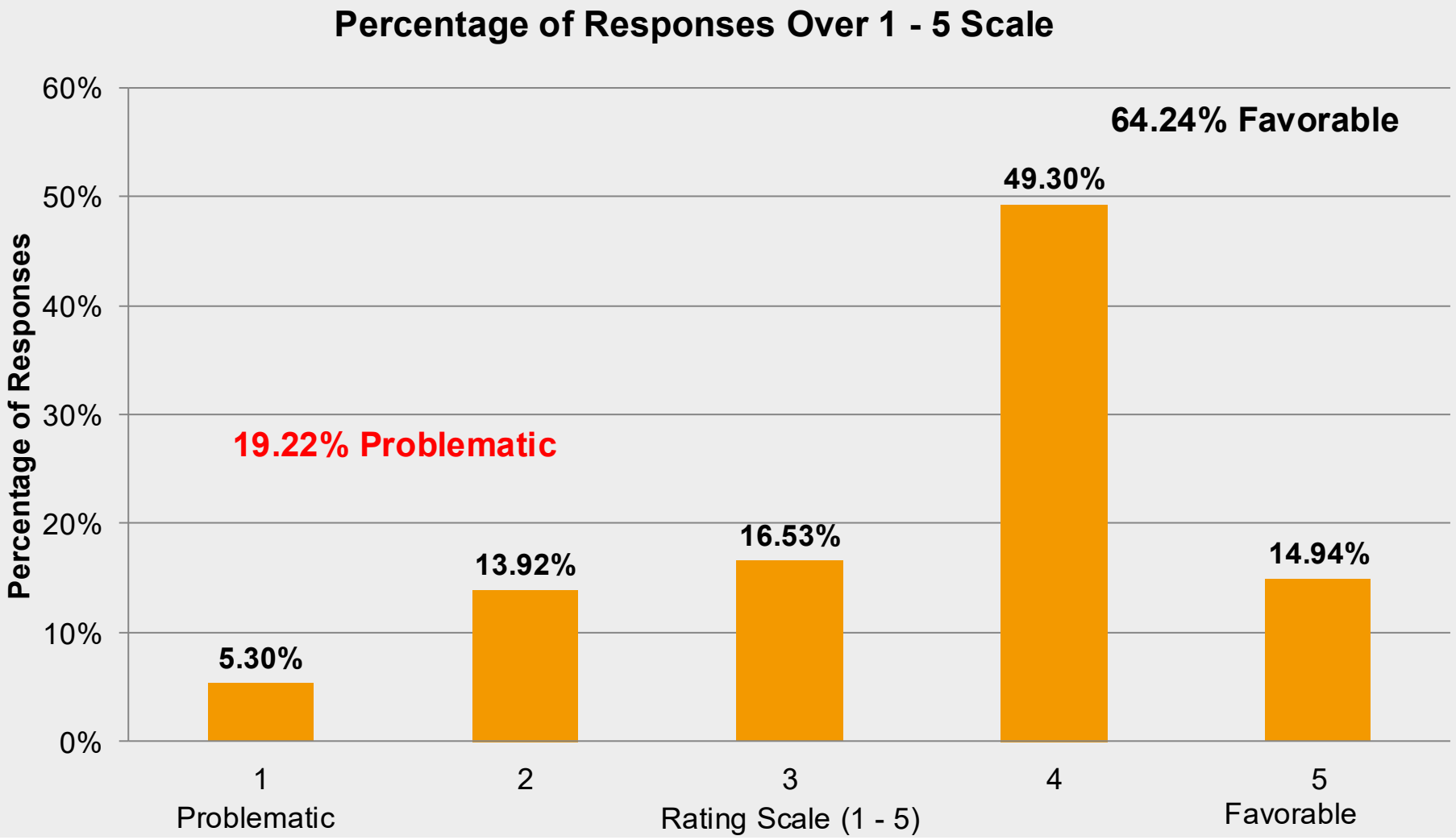
NORMATIVE ANALYSIS: AEROSPACE NORM



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NORMATIVE ANALYSIS: HELICOPTOR TRANSPORT

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AVIATION

What the Frontline workers had to say.

Flight Operations

- Schedule pressure
- Pilot shortage
- Lack of trust
- Low morale
- Reluctance to report
- Low time pilots
- Resource cutbacks impact safety

Maintenance

- Schedule pressure
- Inadequate staffing
- Lack of trust
- Low morale
- Reluctance to report
- Hi workload – fatigue
- Lack of qualified service personnel
- Resource cutbacks impact safety

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OSES AI UPRADE

Functional Capabilities

AI Enhancements

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OSES AI - Provides Data Driven Analysis

OSES-AI functions as an ***Organizational Early Warning System.***

The system anonymously gathers workforce perceptions regarding:

- Leadership commitment to safety
- Reporting culture
- Safety communication effectiveness
- Procedural compliance
- Production pressure
- Operational discipline
- Risk management effectiveness
- Learning from incidents
- Workforce trust and engagement
- Hazard identification and mitigation
- Training adequacy
- Organizational resilience

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How Artificial Intelligence Adds Value

OSES-AI uses Agentic Artificial Intelligence to evaluate survey results against established safety science models, accident investigation findings, and High Reliability Organization (HRO) principles.

OSES AI analyzes survey responses to identify patterns like:

- Normalization of deviance
- Excessive production pressure
- Procedural and regulatory compliance
- Weak safety reporting cultures
- Leadership credibility problems
- Training deficiencies
- Communication breakdowns
- Organizational complacency
- Inadequate corrective action processes

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Benchmarking Against Historical Accident Patterns

OSES AI highlights risk areas before they become operational failures. AI compares survey results against the common factors identified in accidents taken across different safety critical organizations.

For example, the system can detect conditions resembling:

- Automation induced accidents, like Air France 447, pilot training deficit.
- Challenger-style management communication failures.
- Columbia-style normalization of deviance.
- Boeing 737 MAX decision-making pressures
- Deepwater Horizon production-versus-safety conflicts.
- Fukushima poor risk assessment and preparedness deficiencies.

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OSES AI includes a Natural Language User Interface

Interactive Safety Intelligence Assistant

A built-in AI Safety Advisor provides leaders with:

- Natural language explanations of survey findings
- Risk interpretation assistance
- Statistical result explanations
- Recommended mitigation strategies
- Suggested corrective action priorities
- Follow-up investigation guidance

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Automated Reporting and Decision Support

AI provides evidence-based answers supported by safety science research.

OSES-AI automatically generates:

- Executive summaries
- Safety climate dashboards
- Risk heat maps
- Trend analyses
- Organizational resilience indicators
- Mitigation recommendations
- Board-level briefing materials

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References - Reading

- REFERENCES
  - Ciavarelli, A.P. (2007). *Assessing safety climate and organizational risk.* In, *the 51st Annual Meeting of the Human Factors and Ergonomics Society*. Baltimore, Md.
  - Ciavarelli, A.P. (2005, September). Assessing Safety Climate and Culture: From Aviation to Medicine. *Second Conference on Safety in High Consequence Industries. St. Louis.*
  - Ciavarelli, A.P. (2012, September). *OSES Survey Improvement Study for the NASA Flight Center Organizational Safety Effectiveness Survey (OSES).* Lake Oswego, Oregon: Human Factors Associates.
  - Roberts, K.H. (1990, summer). Managing high-reliability organizations. California *Management Review*. 32, (4), 101- 113.
  - ICAO. (2013). *Safety management manual (3rd ed.) (ICAO Order No. 9859)*. Quebec, Montréal: Author.
  - Woods, D., Dekker, S., Cook, R., and Johannesen, L. (2010) *Behind Human Error*. 2nd Edition, Ashgate.
  - Zohar, D. (2010) Thirty years of safety climate research: Reflections and future directions. *Accident Analysis and Prevention,* Vol. 42, pp. 1517-1522.

- SUGGESTED READING
  - Ciavarelli, A.P. (2008, February). Culture Counts: How does your organization measure up? *Aerospace Safety Magazine.* Washington DC: Flight Safety Foundation. http://www.nat.tur.br/docs/aerosafety/2008/asw_0802.pdf
  - Ciavarelli, A.P. (2016). Integration of Human Factors into Safety and Environmental Management Systems (OTC-27015) *Offshore Technology Conference*, Houston. http://onlinepubs.trb.org/onlinepubs/PBRLit/Ciavarelli.pdf
  - Weick, K.E. and Sutcliffe, K.M. (2007). *Managing the unexpected.* John Wiley & Sons.
  - Roberts, K.H. and Bea, R. (2001). Must accidents happen? Lessons from high-reliability organizations. *Academy of Management Executives*. Vol. 15, No.3, 70-79.
  - Roberts, K. H. (1993). Culture characteristics of reliability enhancing organizations. *Journal of Managerial Issues*, 5, 165-181.

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