

ORGANIZATIONAL SAFETY EFFECTIVENESS SURVEY – OSES¹

<http://www.hfa-oses.com>

hfatonyc@gmail.com

January 30, 2026

General Background of the Organizational Safety Effectiveness Survey

Organizational Safety Effectiveness Survey (OSES) is a copyrighted survey instrument that was based originally on the US Naval Aviation Command Safety Survey (CSA). The CSA was developed in 1997 to assess a naval aviation squadron’s safety climate. Modified versions of the CSA are still in use by the U.S. Navy (Ciavarelli, and Figlock, 1997). At the time that the CSA was developed, Dr. Ciavarelli worked with experts (Roberts 1993, 1990) to lay the foundation for development of CSA. The CSA was based upon principles of a High – Reliability Organization (Roberts and Bea, 2001), and upon studies of organizational climate and safety culture (Zohar, 2010, 1980; Flin, Mearns, O’Connor, and Bryden, 2000).

Other versions of OSES were developed and validated across the aviation, aerospace, energy, and healthcare industries (Ciavarelli 2012; Ciavarelli, 2007; Ciavarelli and Crowson 2004). The OSES capitalizes on the evolution and improvement of the survey content and application process gained from multiple applications across different industries and government agencies. An important part of the OSES development and validation was the NASA sponsored *NASA Survey Improvements Study* conducted by Ciavarelli 2012. That study included a review of current literature related to High Reliability Organizational Theory (Lekka, 2011) in addition to the statistical validation testing. Completion of the NASA sponsored survey improvement study allowed us to enhance the technical merits of the survey and to revise the survey in such a way that it is easier to administer online and to use the results as important employee feedback for managing safety risk and improving safety processes.

High Reliability Organizational (HRO) Conceptual Foundation for OSES²

The concept of the High Reliability Organizations (HRO) was created by social scientists and engineers like Roberts and Bea (2001) and Weick (1999). HRO was brought to broader exposure in a book published by Karl Weick and Kathleen Sutcliffe in 2007 entitled “Managing the Unexpected.” The basic concept of HRO is that there are some organizations that function very effectively and safely because their leadership and organizational management are able to control risks in spite of having to operate in a very hazardous environment. HRO specialists often mention the U.S. Navy – particularly Naval Aviation operating on Aircraft Carriers – as an exemplary HRO organization (Roberts, Rousseau, and La Porte, 1994). HRO advocates also mention the nuclear industry, commercial aviation and air traffic control as organizations that operate in a highly reliable way (Roberts, 1993). There are different views regarding which attributes organizations must have in order to function as an HRO. Some of the more common attributes considered by Bea and Roberts (2001) and Weick and Sutcliffe (2007) include: (1) clear leadership commitment

¹ Copyright 2001 -2021 Human Factors Associates, Inc. All rights reserved.

² Adapted from Ciavarelli 2016, pp. 5-7.

HUMAN FACTORS ASSOCIATES, Inc.

Professionals dedicated to improving performance of high-risk organizations

to safety, (2) intense attention to potential failures, (3) a non-punitive safety reporting culture (4) allowing critical risk decisions to be made by the most qualified people, which is accomplished by pushing operational risk decisions down to the front line.

Safety Culture.

Included in the concept of a high-reliability organization are factors related to the underlying safety culture of the organization. The safety culture is defined as the shared values, beliefs, assumptions, and norms which may govern organizational risk decision making, as well as individual and group attitudes about danger, safety, and the proper conduct of hazardous operations. Culture is passed on to successive generations of an organization's members. Culture molds behavior of individuals through a system of rewards, expectations about status, power and authority relations. Culture helps to establish group boundaries for inclusion or exclusion and creates underlying concepts for managing behavioral deviations. Culture is strongly influenced by the organization's structure and leadership (Schein, 1996, 1990).

James Reason, a well-known organizational safety scientist, succinctly defines the components of organizational culture, as follows:

Shared Values (*What is important*) and **Beliefs** (*How things work*) that interact with an organizations structures and control systems to produce **Behavioral Norms** (*The way things work around here*). (Reason 1997, p.192)

The safety culture focuses on issues regarding what is and what is not believed to be safe, and the accepted values and norms of safe behavior. The safety culture underlies what attitudes and behaviors are rewarded and what attitudes and behaviors are punished or corrected.

Just Culture

The term "just culture" refers to the principles for achieving a culture in which frontline personnel feel comfortable disclosing error, including their own errors - while maintaining professional accountability.

A "just culture" recognizes that individual workers should not be held accountable for system failings over which they have no control (AHRQ, 2008). Some of the key points of a "strong" and "just" safety culture are listed below:

- Shared values about what is safe and unsafe
- Common beliefs about how to conduct safe operations
- Open Reporting – "just culture" advocacy
- Behavioral norms that govern risk-taking, everyday procedures and precautions
- Transmission of values, beliefs and accepted practices to others

OSES Measurement Framework

The OSES Measurement Framework was developed by Ciavarelli (2012), based upon the HRO and safety culture literature cited earlier, as well as extensive Psychometric testing, and inputs from NASA aviation experts. Table 1 shows the resulting framework. (Next Page)

**Table 1: Organizational Safety Effectiveness Assessment Framework
(Aviation OSES)**

ASSESSMENT AREAS (FACTORS)	SAMPLE SURVEY ITEMS
Safety Climate – Culture - SCC	<ul style="list-style-type: none"> • All employees feel free to report errors without fear of management reprisal.
Safety Supervision /Management- SSM	<ul style="list-style-type: none"> • I know who is responsible and accountable for safety in my work area.
Organizational Effectiveness - ORG	<ul style="list-style-type: none"> • I believe that morale is high at my work location/Base.
Safety Information Management - SIM	<ul style="list-style-type: none"> • I get all the information that I need to perform my job safely.
Workload/Fatigue Management - WFM	<ul style="list-style-type: none"> • I seldom feel overburdened by my daily work assignments
Maintenance Specific - MAINT	<ul style="list-style-type: none"> • My Work Location/Base has a sufficient supply of qualified maintenance personnel.

Each Measurement Area defined below, has several appropriate survey items that address the specific areas related to a given measurement area.

- *Safety Climate – Culture* -- Employees share common beliefs and values about safety, reliably follow best practices, and are able to report safety concerns without fear of reprisal.
- *Safety Supervision/ Management* -- Safety personnel establish a robust safety management framework, including safety policy and procedures that guide daily operations, and encourage safety awareness and hazard reporting. Leadership communicates safety goals and policies and promotes active safety participation. Supervisors lead by example.
- *Organizational Factors* -- Leadership sets policies, provides adequate safety resources, effectively manages change, and promotes open reporting of safety issues.
- *Safety Information Management* -- Safety personnel ensure that employees get updated and relevant safety critical information.
- *Workload and Fatigue Management* -- Supervisors provide adequate staff levels and control daily work routines to manage employee rest periods, workload and fatigue.

HUMAN FACTORS ASSOCIATES, Inc.

Professionals dedicated to improving performance of high-risk organizations

- *Maintenance Specific* -- Maintenance operations work “by the book”, by following standard procedures. Managers oversee training, inspections and shift work practices.

Survey Instrument

Human Factors Associates, Inc. works closely with its clients to adapt the core survey items to match the client safety and operational work environment, to address client specific issues, and to incorporate a terminology and vocabulary familiar to the client’s employees.

It is important to understand the OSES is typically administered online. The online system provides a “user friendly” survey taker interface, and includes a password protected web interface for presenting timely graphic statistical summaries of survey results. However, the overall assessment process includes systematic employee interviews, focus groups, and safety document review to obtain an accurate and precise understanding of safety culture.

The OSES includes Likert Style ratings (1-5 Agreement Scale) and open - ended survey taker comment questionnaire items. The OSES uses a five – point Rating Scale defined as, Strongly Disagree = 1, Agree= 2, Neutral = 3, Agree = 4, Strongly Agree = 5. All survey items are presented as positive safety or mission operational performance topics. The following screen shot sample questionnaire items are taken from the web - based OSES.

HUMAN FACTORS ASSOCIATES, Inc.

Professionals dedicated to improving performance of high-risk organizations

Example of “Likert style” rating item.

SECTION I: Items (12 questions)					1- 5-point rating scale	
1	I believe our Center has an effective safety reporting process.					
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable	
					<input type="radio"/>	
					Don't Know	
2	My Supervisor is actively involved in the Center's safety program.					
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable	
					<input type="radio"/>	
					Don't Know	

Example of open ended item

SECTION II: Open Ended (3 questions)	
1.	In your view, what situation or specific hazards or other factors may lead to an accident?
<div style="background-color: #ffffcc; height: 80px; border: 1px solid black;"></div>	
2.	In your view, what are the most important safety actions that the company can take to reduce the chances of an accident?

HUMAN FACTORS ASSOCIATES, Inc.

Professionals dedicated to improving performance of high-risk organizations

The OSES Web Survey user - interactive software platform dashboard provides immediate online feedback of survey results, using diagnostic statistical summary charts of the types shown below:

Chart 1: Online Statistical Summary Graphs for Overall Survey Results

Print This Page

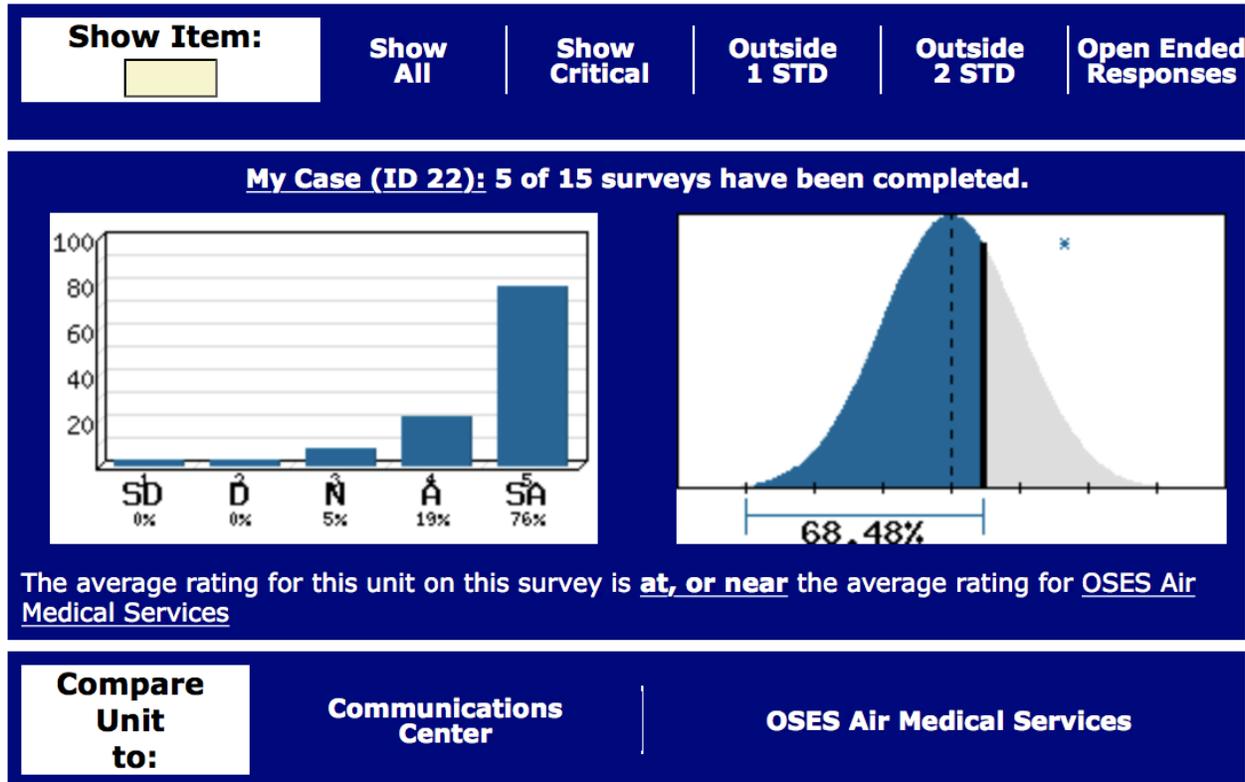


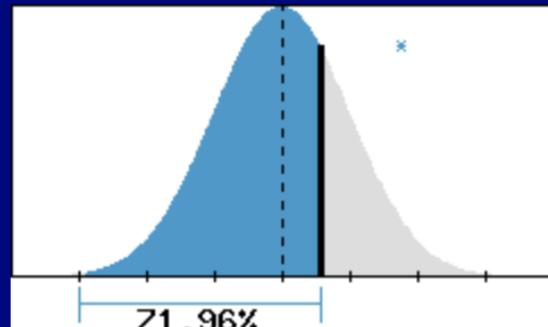
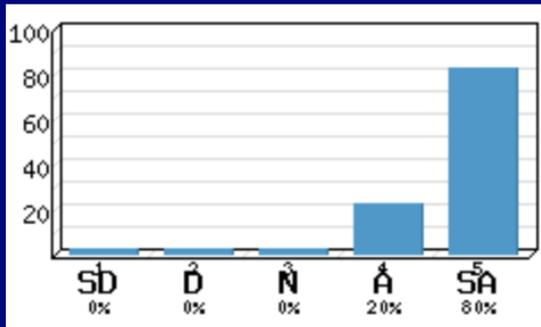
CHART 1: Left Side shows Relative Percentage of ratings across 5-point Scale showing the overall the organization's average performance. Right Side shows average and position of rating average on Normal Distribution for this Center, as measured against the company average taken across all survey items, company divisions and employees.

**Chart 2: Online Statistical Summary Graphs for Selected Survey Item
(Fictitious Data)**

[Show All](#)

Returned 12 results.

1: I believe our Center has an effective safety reporting process.



The average rating for Item 1 for this unit on this survey is **slightly above** the average rating for OSES Air Medical Services

**Compare
Item to:**

**Communications
Center**

OSES Air Medical Services

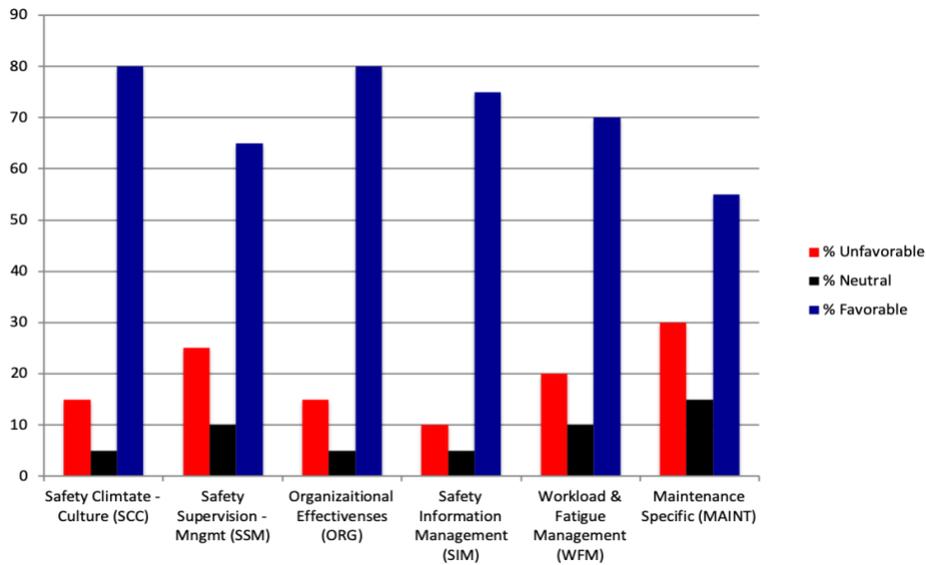
CHART 2 Survey Item 1 Results: Left Side shows Relative Percentage of ratings across 5-point Scale. Right Side shows average and position of rating average on Normal Distribution for Survey Item #1.

Analysis of Results

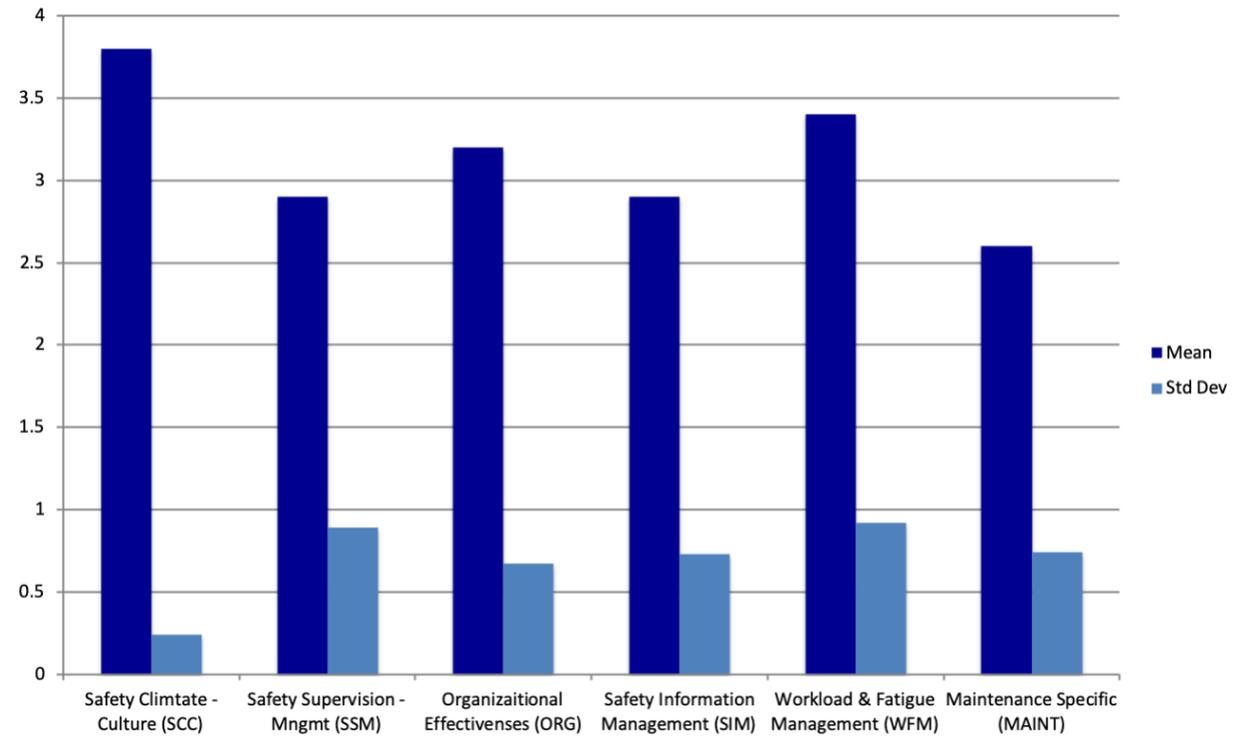
The OSES software platform includes a Research Module that allows easy downloading of all data, ratings and comments to an Excel Worksheet for more detailed statistical analysis. Data can be grouped by Measurement Area using OSES Factor Categories determined from Factor Analysis (Ciavarelli 2012).

The following charts show summary statistics computed from data downloaded using the Research Module download feature. Results are compared for each of the selected OSES factors, or areas of measurement interest.

**Sample OSES Results Chart:
Fictitious Data: Results by OSES Factors:
Percent Favorable (4-5 Ratings)**



**Sample OSES Results Chart:
Fictitious Data: Results by OSES Factors:
Means and Standard Deviations**



Survey Application Process

The OSES was developed and validated, using Factor Analysis and Reliability Testing to arrive a 48-rating survey item pool, categorized into six orthogonal (unique) Factors, Safety Climate-Culture, Safety Management, Organizational Effectiveness, Safety Information Management, Workload and Fatigue Management, and Maintenance Specific (Ciavarelli, 2012). These categories are defined on page three. Human Factors Associates, works with clients (who may represent different domains outside of aviation) to adapt the core validated HRO generic survey items, by appropriate editing, deletions and additions in order to tailor the survey for a particular domain application. Here are the steps taken to arrive at a useable, yet reliable and valid survey application.

- 1.HFA representatives gather safety documentation and conduct interviews and focus group discussions with a cross section of company/agency employees.
- 2.HFA constructs tailored survey based on the use of previously validated survey items and inputs from document review and personnel interviews.
- 3.A draft survey is presented to safety personnel for review and revision, then finalized for survey application.
- 4.The final survey client inputs and demographic information are uploaded to the web or a scanable paper version is created.
- 5.The survey is administered in accordance with preplanned schedule of events, including announcements/survey instructions, survey distribution, collection and analysis of survey data, and results reporting.
6. Results, including Normative Benchmarks, are presented along with recommendations for safety improvement interventions when warranted.
7. A time frame is established for a follow on second survey round that will provide results to be compared to the original “benchmark” Survey.

REFERENCES AND BIBLIOGRAPHY

AHRQ (2010). *Becoming a high reliability organization: Operational Advice for Hospital leaders*. Prepared by the Lewin Group, Falls Church, VA.

Ciavarelli, A.P. (2016). Integration of Human Factors into Safety and Environmental Management Systems (OTC-27015) *Offshore Technology Conference*, Houston.

Ciavarelli, A.P. (2012, September). *Survey Improvement for the NASA Flight Center Organizational Safety Effectiveness Survey (OSES)*. Lake Oswego, Oregon: Human Factors Associates.

Ciavarelli, A.P. (2010, November). *Seminar on the Necessity of Cultural Change to Promote Reporting on Air Safety Issues to Complement ICAO Requirements (TPT 07/2009A)*. Singapore: Asia Pacific Cooperation.

HUMAN FACTORS ASSOCIATES, Inc.

Professionals dedicated to improving performance of high-risk organizations

Ciavarelli, A.P. (2008, February). Culture Counts: How does your organization measure up? *Aerospace Safety Magazine*. Washington DC: Flight Safety Foundation.

https://flightsafety.org/wp-content/uploads/2016/12/asw_feb08.pdf

Ciavarelli, A.P (2007, October). Assessing safety climate and organizational risk. Baltimore, MD, *HFES 51st Annual Meeting*.

Ciavarelli, A.P. (2005, September). Assessing Safety Climate and Culture: From Aviation to Medicine. *In, St. Louis University Conference Proceedings on Safety in High-Consequence Industries*. St. Louis, Missouri.

Ciavarelli, A.P. & Crowson, J. (2004, March). Organizational Safety Effectiveness Assessment. *In, St. Louis University Conference Proceedings on Safety in High-Consequence Industries*. St. Louis, Missouri.

Ciavarelli, A.P, Figlock, R., Sengupta, K., and Roberts, K. (2001) Assessing organizational accident risk through survey questionnaire methods. *In, Proceedings of the 11th Annual International Aviation Psychology Conference*. Columbus.

Ciavarelli, A.P., (2001, February). Human Factors Checklist: A tool for Aircraft Accident and Incident Investigation. *Flight Safety Digest*. Washington DC: Flight Safety Foundation.

Ciavarelli, A.P., (1997). Cockpit design factors: *What we learn from aircraft accidents*. Paper presented at the *SAE/AII World Conference*. Los Angeles, CA.

Ciavarelli, A.P. and Figlock, R. (1997). Organizational factors in Naval Aviation accidents. *Proceedings of the International Aviation Psychologists* Columbus, OH.

Flin, R., Mearns, K., O'Connor, P., and Bryden, R., 2000. Measuring safety climate: Identifying the common features. *Safety Science*, 34, 177-92.

Desai, V.M., Roberts, K.R., and Ciavarelli, A.P. (2006, winter). Defensive attributions in the formation of perceived safety climate. *Human Factors and Ergonomics*, 48. (4) 639-650.

Gaba, D., Singer, S., Sinaiko, A., & Ciavarelli, A.P. (2003, summer). Safety Culture differences between hospital personnel and naval aviators. *Human Factors and Ergonomics*.

ICAO. (2009). *Safety management manual (2nd ed.) (ICAO Order No. 9859)*. Quebec, Montréal:

ICAO. (2013). *Safety management manual (3rd ed.) (ICAO Order No. 9859)*. Quebec, Montréal:

Lekka, C. (2011). High Reliability Organizations: A review of literature (RR 899 Research Report. Health and Safety Institute (HSE), UK.

Libuser, C.B. (1994). *Organizational structure and risk mitigation (Ph.D. Dissertation)*. Los Angeles, CA: University of California at Los Angeles (UCLA).

HUMAN FACTORS ASSOCIATES, Inc.

Professionals dedicated to improving performance of high-risk organizations

- Maurino, D. (2017, March). *An introduction and overview of Safety Management Systems*. Prepared for Round Table on Safety Management Systems. OECD – ITF, Paris, France.
- Ostrowski, K.E. (2016). *USAF Aviation Safety Program Gap Analysis using ICAO Safety Management System Guidance*. American Society of Safety Engineers.
- Reason, J. (1997). *Managing risks of organizational accidents*. Brookfield: Ashgate.
- 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. (1990). Managing high-reliability organizations. *California Management Review*. 32 (4), 101-113.
- Roberts, K.H. (1993). Culture characteristics of reliability enhancing organizations. *Journal of Managerial Issues*, 5, 165-181.
- Roberts, K., Rousseau, D., and La Porte, T. (1994). The culture of high reliability: Quantitative and qualitative assessment aboard nuclear-powered aircraft carriers. *Journal of High Technology Management Research*, 5, 141-161.
- Royal Aeronautical Society (2017). *Achieving peak safety performance: Listening and learning*. <https://www.aerosociety.com/news/achieving-peak-safety-performance-listing-and-learning/>
- Schein, E.H. (1996). Culture: The missing concept in organizational studies. *Administrative Science Quarterly*, 41, 229-240.
- Schein, E.H. (1990). Organizational culture, *American Psychologist*, 45, (2), 109-119.
- Stolzer, A.J., Halford, C.D., Goglia, J.J. (eds.) 2011. *Implementing safety management systems in aviation*. Ashgate. Burlington, Vermont.
- Singer, Sara, J, Rosen, A., Zhao, S. Ciavarelli, A.P. Gaba, D.M. (2010). Comparing safety climate in naval aviation and hospitals: Implications for improving patient safety. *Health Care Management Review*. Apr-Jun; 35(2): 134-46.
- Waller, M.J., and Roberts, K.H., High reliability and organizational behavior: Finally the twain must meet. *Journal of Organizational Behavior*, 24, 813-814.
- Weick, K.E. (1999). Organizing high reliability. Processes of collective mindfulness. *Research in Organizational Behavior*, 21, 81-123.
- Weick, K.E., and Sutcliffe, K.M. (2007). *Managing the unexpected*. John Wiley & Sons.
- Westrum. R. and Adamski, A.JH. (1999). Organizational factors with safety and mission success in aviation environments In, D.J. Garland, J.A Wise, and V.D. Hopkins (eds). *Handbook of Aviation Human Factors*. Lawrence Erlbaum, NJ.

HUMAN FACTORS ASSOCIATES, Inc.

Professionals dedicated to improving performance of high-risk organizations

Zohar, D. (2010) Thirty years of safety climate research: Reflections and future directions. *Accident Analysis and Prevention*, Vol. 42, pp. 1517-1522.

Zohar, D (2002). Safety climate: Conceptual and measurement issues. In J. Quick & L. Tetrick (Eds.), *Handbook of occupational psychology* (pp. 123-142). Washington DC: American Psychological Assoc.

Zohar, D. (1980). Safety climate in industrial organizations: Theoretical and implications. *Journal of Applied Psychology*, (1), 96-102.

ORGANIZATIONAL SAFETY EFFECTIVENESS SURVEY (OSES)

SAMPLE OF SURVEY ITEMS FOR AVIATION³

Likert Style Rating Items (1 – 5 Scale)

Safety Climate and Culture (SCC)

1. I believe that all employees strive to accomplish our operations in the safest possible manner.
2. I believe that the Company has a trustworthy non-punitive safety reporting process.
3. My work location/base provides clear procedures for preventing personal injury.
4. I believe that the Company provides my work location/base with adequate resources to support safe operations.
5. Managers at my work location/base are actively involved in the Company safety program.
6. Working safely is an integral part of all operations at my work location/base.
7. There is genuine commitment to safe work practices at my work location/base.

Safety Supervision - Management (SSM)

8. The Company regularly conducts thorough safety audits.
9. Local management has a clear picture of the risks involved in operations.
10. I believe that the Company has a very useful risk management process.
11. Safety personnel are influential in promoting safety at my work location/base.
12. My work location/base has an effective method for updating and correcting procedures
13. My organization is willing to make needed changes when it receives data or results that indicate a particular operation or situation is not working as well as intended.

Organizational Effectiveness (ORG)

14. My Supervisor recognizes workers (me) for their (my) high-quality performance.
15. My Supervisor can be relied upon to keep his/her word.
16. I believe that employee morale at my work location/base is high.
17. Company executives can be trusted to keep their promises to all employees.
18. Company management has adequately prepared all employees for ongoing changes to our business operations and organizational structure.
19. Good communications flow exists up and down the Company's chain of command.

Safety Information Management (SIM)

³ OSES Copyright 2001-2018 Human Factors Associates, Inc. All rights reserved.

HUMAN FACTORS ASSOCIATES, Inc.

Professionals dedicated to improving performance of high-risk organizations

20. I have received specific training related to the high-risk elements of my job.
21. Submission of a safety concern is acknowledged in a timely manner.
22. Feedback is provided to the person who reported a safety concern regarding what actions are planned or taken.
23. People at my work location/base willingly provide advice to each other concerning safety matters.
24. Our safety reporting system is easy to use.

Workload and Fatigue Management (WFM)

25. I seldom feel overburdened by my daily work assignments.
26. I do NOT have a problem staying alert on the job.
27. I am confident that I can complete all of my work within my normal shift period.
28. I believe that we have a sufficient number of personnel for our current operational tempo.

Maintenance Specific Survey Items (MAIN)

29. The “signing off” for any completed maintenance or repair job is done with absolute integrity.
30. An adequate hand-over is accomplished for any rotation of maintenance personnel so that job requirements and safety issues are effectively covered.
31. Management of maintenance operations provides effective leadership and oversight of maintenance work.
32. Maintenance management encourages us to work by the book.

OSES Open – Ended Survey Items

1. The most significant safety hazards that could lead to an accident, or a failure to properly manage safety at my work location/base are:
2. In your view, what are the most significant safety actions that my work location/base management can take to reduce that chance of an accident?
3. What aspects of Company policies, procedures or protocols do you think have had a positive impact on safety?
4. What aspects of Company policies, procedures, or protocols do you think have had a negative impact on the safety?
5. What additional training would help you perform your job more effectively?
6. Is there anything else that you think is an important safety matter or culture issue that was not addressed in this survey?