CNA

Lessons on Safety Culture from Private-Sector Safety Executives

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Abstract

The Department of Defense is looking for ways to implement a safety culture that will endure changes in leadership. As part of this effort, the Office of the Secretary of Defense has asked CNA to conduct a series of C-suite engagements with senior safety executives from Fortune-ranked companies. In this study, we summarize our findings from these C-suite engagements and recommend some potential DoD leadership actions. Our findings are concentrated on the broad areas of safety practices, safety metrics, and safety resourcing.

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Executive Summary

The Office of the Assistant Secretary of Defense for Readiness (OASD(R))/Force Safety and Occupational Health (FSOH) asked CNA to gather information from Fortune 1000 companies on the safety policies and practices that contribute to their safety cultures. Specifically, we were asked to hold engagements with C-suite–level executives who manage and oversee large and complex organizations, which is similar to how Office of the Secretary of Defense (OSD) develops policy and oversees Department of Defense (DoD) Component policy implementation. The goal of the study is to provide specific recommendations to OSD based on industry best practices to improve the safety culture within the DoD.

Study approach

To understand how private-sector companies establish and maintain a safety culture, we held C-suite engagements with 21 *Fortune* magazine–ranked companies. In each engagement, we asked a set of structured questions on the following topics:

- Safety practices: best ways to create and sustain
- Safety metrics: measuring safety outcomes
- Safety policies: defining safety philosophy
- Safety program resourcing
- Voluntary Protection Program (VPP) participation (when applicable).

After hosting the C-suite engagements, we compiled our findings by identifying common themes and novel approaches.

Findings

The following table summarizes our findings and potential leadership actions.

Finding	Potential leadership action
Safety messaging starts with leadership but must be repeated at all levels and in multiple settings	Increase safety engagements during meetings and in overall decision-making
Safety is governed at the highest levels of the company; senior executives, making safety a core value	Ensure that safety is governed at the highest levels of DoD and that managers at all levels make safety a core value
Safety meetings/trainings are held in conversational forums	Develop a Department-wide Safety Conversation Series
Senior management receives safety-specific training	Ensure that new leaders receive rigorous safety-focused training that is periodically refreshed throughout their tenure
A successful safety culture empowers employees and incentivizes/rewards reporting safety incidents and hazards	Create an incentive program for safety reporting and reward employees for innovative safety ideas
Senior safety executive should be no more than two levels below the top executive	Ensure that safety designees report to the most senior official at every organizational level
Regular internal safety audits and evaluations as well as external audits by organizations such as OSHA are required	Require robust audit programs throughout DoD and ensure noncompliance findings are tracked to closure
Safety regulators and overseers must have effective methods to assess safety culture	Develop a formal safety culture assessment framework to deploy across DoD
OSHA's VPP is important for establishing and sustaining a strong safety culture	Implement a recognition program like VPP across DoD as part of a comprehensive SMS
Track leading indicators	Track leading indicators such as completion of assigned training, work stoppages, near-misses, and ergonomic assessments as well as results of quarterly internal audits to identify hazards and establish remediation plans
Senior safety executives receive safety updates/metrics regularly	Ensure that senior leaders receive regular safety updates
Technology plays a critical role in reporting	Require electronic data collection and reporting
EHS data is collected and reported but not often used for predictive analysis	Incorporate advanced data analytics to forecast safety trends

Finding	Potential leadership action
Private-sector entities have access to financial resources necessary to address safety issues; thus, they do not discretely budget for safety	No specific action can be identified as DoD resourcing differs significantly from private-sector practices.

Source: CNA.

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Introduction

Background and study motivation

In recent years, the military has experienced several high-visibility mishaps, such as the crashes of two AH-64 Apache helicopters in Alaska and two Black Hawk helicopters in Kentucky leading the Army to conduct a safety standdown in April 2023. Similarly, in June 2022 the Marine Corps also had a series of aviation mishaps leading to a safety standdown. These types of mishaps have led to concerns about the safety culture within the Department of Defense (DoD), which must grapple with how to build a sustained culture of safety for an organization whose core mission is laden with risk and frequent leadership turnover.

The Office of the Assistant Secretary of Defense for Readiness (OASD(R))/Force Safety and Occupational Health (FSOH) asked CNA to gather information from Fortune 1000 companies on the safety policies and practices that contribute to their safety cultures. Specifically, we were asked to hold engagements with C-suite–level executives in charge of safety at selected Fortune 1000 companies because these individuals have similar leadership roles in their organizations as OSD senior leaders do with the Military Services. Leaders at this level are ultimately responsible for safety policy and oversight within their organizations. We were also asked to gather information on how these companies measure safety performance and recommend specific OSD actions to improve safety culture within DoD.

The DoD is wrestling with the following questions:

1. How can DoD implement an enduring safety culture in its high-risk environment at the highest echelons of the OSD?
2. How does a safety culture endure through changes in leadership?

As one part of addressing these questions, our tasking examines executive-level management (C-suite) of private-sector safety programs (including related policies, practices, and incentives), with the goal of identifying elements that can contribute to a more proactive safety culture throughout DoD by incentivizing safe behavior, having information to manage risk, and reducing mishaps. This project focuses on developing an overarching safety framework for the long-term sustainment of such a culture within DoD.

This study is one of numerous efforts that OSD is undertaking to establish an enduring DoD safety culture. Other ongoing actions include developing and implementing the first-ever DoD Safety and Occupational Health (SOH) Strategic Plan, reinvigorating the Defense Safety

Oversight Council as the Department's senior-leader SOH governance forum, standardizing data collection and reporting requirements, and refining the process of identifying and allocating safety resources. We were not asked to perform a gap analysis of the "as-is" and "to-be" states of DoD safety culture. In this study, we focus exclusively on the "to-be" state by gaining insights from the private sector that could improve DoD's enduring safety culture.

Our specific tasking included both what to do and how to do it, along with the rationale (why?) for recommended actions:

- *What? Gather information* from *Fortune* magazine-ranked companies about
  - the safety policies, practices, metrics, and incentives that contribute to their safety cultures
  - how they measure safety performance and report it to senior leadership
- *How? Do this by* holding engagements with C-suite–level executives from these companies because they, like OSD officials, are responsible for drafting safety policy (rather than implementing it)
- *Why? Use this to* recommend specific OSD actions to improve safety culture within DoD.

What is safety culture?

There is no single definition of safety culture, but many experts agree that it is a multi-dimensional construct that reveals an organization's attitude toward taking risk. Popularized in the late 1980s, the term *safety culture* is rooted in the research on organizational culture and leadership. Since then, there have been many different definitions found in the literature. Wiegmann et al. provide a universal definition that leverages many of the other definitions' commonalities:

> Safety culture is the enduring value and priority placed on worker and public safety by everyone in every group at every level of an organization. It refers to the extent to which individuals and groups will commit to personal responsibility for safety; act to preserve, enhance, and communicate safety concerns; strive to actively learn, adapt, and modify (both individual and organizational) behavior based on lessons learned from mistakes; and be rewarded in a manner consistent with these values.[1]

The universal definition highlights several salient key points for DoD:

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[1] Douglas A. Wiegmann, Terry L. van Thaden, and Alyssa Mitchell Gibbons, "A review of safety culture theory and its potential application to traffic safety," in *Improving Traffic Safety Culture in the United States: The Journey Forward* (Washington, DC: AAA Foundation for Traffic Safety, April 2007), pp. 113–130, https://aaafoundation.org/wp-content/uploads/2018/02/ImprovingTrafficSafetyCultureinUSReport.pdf.

1. *Enduring value*—OSD seeks to create a safety culture that is enduring and transcends leadership changes

2. *Multilevel organization*—OSD is a large organization with many levels; it is critical that safety is valued at all levels

3. *Learning from mistakes*—OSD seeks a learning environment where mishaps are learned from and are not repeated

4. *Rewards are consistent with values*—OSD wants to incentivize safe behaviors, risk management, and recognize safety practices aligned with its values.

Why is safety culture important?

Simply put, a strong safety culture leads to fewer injuries, accidents, and safety incidents. Looking at it from an OSD perspective, though, neglecting safety is a tangible detractor from force readiness. When frequent mishaps occur, not only do they put Service members and civilians at risk, they also degrade public confidence in the military and hinder the ability of the military to execute its various missions, especially those called for in recent National Defense Strategies.

There are also direct dollar costs associated with a poor safety culture. Regarding DoD, injuries to Service members increase healthcare costs and may increase personnel costs if these Service members cannot return to duty quickly, or at all, because of their injuries. Broken equipment must be fixed or replaced. Lower public confidence in the armed forces makes recruiting and retention of personnel harder. In short, the OSD has identified taking care of its people as a priority, and increased costs and decreased readiness are additional incentives for DoD to embrace an enduring safety culture.

Acknowledgements

We would like to thank the many companies that graciously offered their time and knowledge to contribute to this study. (For a full list of companies and participants, see Appendix A: List of participating companies.) Without their contributions, we would have not been able to complete this study.

Report organization

In the remainder of this paper, we will discuss our approach to the C-suite engagements, provide our findings from the C-suite engagements and identify potential OSD leadership actions, and conclude with implementation considerations for the potential leadership actions we recommend.

Study Approach/Methodology

To prepare for our engagements with C-suite–level safety leadership in the private sector, we had to develop an outreach and engagement strategy, create a list of discussion topics, and determine a methodology for synthesizing the information collected from the discussions.

Sourcing the *Fortune*-ranked companies

For our C-suite–level engagements, we reached out to approximately 50 *Fortune* magazine–ranked companies.[2] The emphasis on *Fortune* magazine–ranked companies ensured that most of the companies with which we consulted were large enough to have multiple divisions and/or subsidiaries. This, in turn, ensured that the safety-related responsibilities of their executives were somewhat comparable to those of OSD leadership with respect to DoD Service branches. We focused on companies in the following eight industrial sectors:

- Maritime transportation
- Energy and gas
- Aerospace, aeronautics, and aviation
- Commercial goods manufacturing
- Automotive and airlines
- Shipping and logistics
- Chemical
- Healthcare and pharmaceuticals.

These sectors were selected because each shares some common feature or features with military work environments, such as working with heavy machinery and working in physically challenging and/or high-risk environments.

Of the 50 companies contacted, we were able to complete our engagements with 21 of them, resulting in about a 42 percent response rate. The full list of companies and the industry breakdown is provided in Appendix A: List of participating companies.

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[2] Companies included in our study are all similar to those in the *Fortune* magazine-ranked in scale of business operations, thus making them comparable to the DoD.

According to Investopedia.com, the Fortune 1000 are the 1,000 largest American companies ranked by *Fortune* magazine. The annual ranking is based on revenue generated from core operations, discounted operations, and consolidated subsidiaries.

Of the 21 companies, six were Fortune 1000, six were Fortune 500, four were Fortune Global 500, and one was Fortune 100 "Best Companies to Work For". Three privately held companies were not *Fortune*-ranked.

Each company was identified via internal CNA business contacts or because it was recognized as a safety leader in the Occupational Safety and Health Administration's (OSHA) Voluntary Protection Programs (VPP).[3] Specifically, we selected VPP program participants that had received a "Star" rating for multiple US sites within the company. The "Star" rating is the highest VPP rating and recognizes exceptional performance in five key areas: management commitment, employee involvement, worksite analysis, hazard prevention and control, and health and safety training.

Selecting contacts for the engagement

In reaching out to companies, our goal was to set up a conversation with the most senior executive in charge of safety. What we found is that the senior safety executive is usually partnered with health and environment or regulatory and legal affairs, depending on how the company organizes its safety responsibilities.[4] The title assigned to this individual ranged from vice president to director. In all cases, our engagements were held with senior safety executives (or their designees) with knowledge of and responsibility for safety policies for all (or most all) of the company.

Though their titles varied, for simplicity's sake in this report, we will refer to the contacts in these companies with whom we spoke as *senior safety executives*.

Conducting the engagement

In our initial meetings with senior safety executives via video conference, we introduced the motivation and goals of our study. We assured the company representatives that their comments were not for attribution.[5] Any information attributed to a specific company in this report was obtained from publicly available sources such as the company's website; published environment, health, and safety (EHS) reports; or sustainability reports, which contain summary statistics and high-level information on the company's safety goals and performance.

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[3] OSHA's VPP is a recognition process to promote effective worksite-based safety and health. In VPP, management, labor, and OSHA establish cooperative relationships at workplaces that have implemented a comprehensive safety and health management system. There are other recognition programs, like the International Organization for Standardization (ISO) 45001, that are used by many companies.

[4] Within DoD, safety and environment are not combined at the OSD level

[5] A few companies required non-disclosure agreements that detailed the restrictions on sharing information from our conversations.

Some companies also allowed us to share details about our conversations with express written permission.

After the initial meeting, we asked for a 60-minute follow-on discussion to dive deeper into the company's safety culture. The semi-structured discussions were guided by a set of questions in the following topic areas (the number in parenthesis represents the number of questions in each area):

- Safety practices: best ways to create and sustain (11)
- Safety metrics: measuring safety outcomes (7)
- Safety policies: defining how safety fits into the corporate vision (5)
- Safety program resourcing (2)
- VPP membership [6] (5).

These discussion questions were informed by our literature review and finalized in coordination with the sponsor. [7] The full list of questions is in Appendix B: C-suite engagement questions.

Following the discussions, we allowed the companies to review our notes on the engagement and provide any additions, deletions, or corrections to the information we collected.

Compiling our findings

Our next task was to aggregate the key findings from our C-suite engagements. Our goal was to identify common themes, novel approaches, and general strategies to building and sustaining a safety culture that DoD leadership could adopt. The common themes were ideas that we heard from multiple companies representing industry practices, metrics, or polices that are widely used. Novel approaches were mentioned less frequently but were considered to be innovative or creative ways to address the need for a safety culture or practice. Our goal here was to capture information that is forward leaning and has potential to elevate OSD's approach to guiding and overseeing safety practices, collecting and using safety metrics, and/or developing safety policies. Lastly, we captured general safety strategies that underpinned some of the company's safety cultures. The general safety strategies fall into the category of organizational safety philosophies or organizational safety culture assessment models.

Once all C-suite engagements were completed, we used the NVivo software tool to conduct qualitative data analytics. Our primary purpose for using NVivo was to organize our notes,

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[6] Only companies that have VPP sites were asked the VPP questions.

[7] See Appendix C: Bibliography from literature review.

confirm the common themes, and identify new themes. Specifically, we used NVivo's coding process to recognize common themes across our company engagements and make a connection with all the companies that raised them.

After compiling the findings, we developed potential leadership actions for OSD to implement an improved safety framework, strategy, or culture.

Limitations of our approach/scope

No baseline for comparison

At the request of the study sponsor, we did not conduct a comprehensive review of the Services' or DoD's current safety programs, policies, and initiatives. This information would have allowed us to complete a gap analysis of "as-is" safety policies and practices to compare to a desired "to-be" state. Instead, our tasking was to provide an unbiased information gathering from the private sector's safety programs that may validate existing or planned OSD actions in addition to providing novel ideas for establishing or bolstering DoD's safety culture. Thus, we can only point to potential leadership actions that OSD might take, as some of those actions may already be underway or represent programs or policies that OSD has already implemented or plans to implement soon.

Scant information on private sector safety program efficacy

Although we describe the common themes and novel approaches to safety programs/ initiatives that we heard about during our conversations with *Fortune* magazine–ranked companies, we could not collect information or data about their efficacy. For example, we discussed the types of metrics used, but the senior safety executives with whom we discussed metrics did not provide any results of applying those metrics over time. Thus, we were not able to identify any trends in the metrics.

Findings

In this section, we summarize the information we collected during the engagement process and organize the findings according to three sets of safety program features common to most of the companies with whom we engaged: safety practices, safety data and metrics, and safety resourcing and budgeting. In addition, for each finding, we identify an associated potential OSD leadership action and, for all but two findings, we present a particularly compelling example, which we call the *private-sector spotlight*.[8]

Safety practice findings

Finding: Safety messaging starts with leadership but must be repeated at all levels and in multiple settings

Private-sector senior safety executives noted that safety messaging must start with leadership. Moreover, the messaging must be frequent and persistent over time and must use varying communication strategies. For example, our C-suite–level engagements indicated that to establish safety messaging in the culture of an organization, managers must often begin key meetings with a "safety moment."

Some senior safety executives noted that CEOs talk about safety in "All-Hands" meetings and other business-wide communications. Other organizations hold annual safety weeks or stand-downs, where the entire organization dedicates its focus to safety. Private-sector senior safety executives stressed that communicating and messaging safety over and over and from different sources is key. Likewise, they noted that corporate management should vary the content of their safety messages to engage multiple audiences, such as by describing specific safety incidents or near-misses that occurred rather than referring to aggregate safety metrics only.

Potential leadership action: Increase safety engagements during meetings and in overall decision-making

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[8] The companies we selected to spotlight have publicly available information or gave express permission to share their examples.

Private sector spotlight: General Motors'(GM) Safety and Health in Everyday Leadership Discussions (SHIELD) process

GM seeks an enterprise safety culture where each person constantly strives to keep themselves and their team members safe. To create and sustain a mindset where employees consider safety and health in all that they do, corporate management considered what actions they could take in their own decision-making processes to promote this attitude. They implemented a process called Safety and Health in Everyday Leadership Discussions (SHIELD), to be used in meetings where strategic business decisions are made. In lieu of a traditional safety message that is set apart from the rest of the meeting agenda items, senior management ask probing questions about safety in selected agenda items. The goal is to help create awareness and understanding of potential safety impacts of leader decisions not only in areas where there are clear safety implications, but also when the item may appear unrelated to safety culture. According to the company representatives, using the SHIELD process has increased safety engagement during meetings and in overall decision-making.

According to GM senior safety executives, SHIELD is applicable to any leadership meeting agenda. Before a given meeting, the SHIELD message leader reviews the agenda and develops probing health and safety questions for topics of choice. GM senior safety executives provided the following hypothetical example: If there is an agenda item about making up lost production at a factory after an unforeseeable interruption, the SHIELD message leader might collect health and safety data related to employees working overtime. The message leader could lead the discussion with probing questions about how health and safety considerations may impact production makeup plans. SHIELD messages are not scripted but are tailored to be relevant and engaging for each meeting.

Finding: Safety is governed at the highest levels of the company; senior executives make safety a core value

Private-sector senior safety executives ensure that their managers and employees are complying with and meeting safety requirements by holding top-level executives accountable for safety performance. This includes requiring top-level executives to report regularly to the CEO and corporate board of directors on the status of occupational health and safety performance for their respective operating divisions. Per senior safety executives, safety is a fundamental responsibility of every leader within the company.

Further, private-sector senior safety executives tend to define safety formally as a core business value that is fully integrated with all work activities. These organizations do not delegate safety to the status of a priority, a process, or a program—it is a *value*. Core values are constant and remain part of an organization's culture, whereas priorities change. Senior safety executives tend to emphasize in their annual reports and other corporate occupational health

and safety literature that safety and health add value to their businesses, to their respective workplaces, and to the overall quality of their employees' lives.

By defining safety as a core value, these organizations also broadly include safety as a measure of business success that provides them with a competitive advantage. They directly link achieving excellence in safety performance to their corporate bottom lines.

Potential leadership action: Ensure safety is governed at the highest level of the DoD and that managers at all levels make safety a core value

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Private sector spotlight: General Electric's (GE) emphasis on operational ownership

GE has learned that the way to deliver high EHS performance is through *operational ownership*, which means that GE holds its site and service managers accountable for the safety and environmental integrity of the operations they supervise. GE's EHS professionals support and guide its safety and compliance programs, but GE expects its operations managers to take the lead. The operational manager reports to a member of the senior executive team, who reports to the CEO.

GE ensures operational commitment through (1) constant reviews of managers' EHS performance; (2) comprehensive EHS audits conducted by an independent central governance team; (3) in-depth classroom EHS training for new managers; and (4) feedback surveys in which employees anonymously evaluate their managers' EHS commitment.

Finding: Safety meetings/trainings are held in conversational forums

Private-sector senior safety executives noted that another common practice is holding safety meetings or trainings in more interactive and conversational forums rather than in traditional classroom settings. Senior safety executives noted that employee involvement in safety conversations is critical, describing how overconfidence and other biases that can lead to poor judgment are explained and openly discussed. Senior safety executives noted that this helps employees recognize situations where they may be inadvertently putting themselves or others in harm's way.

Potential leadership action: Develop a Department-wide Safety Conversation Series

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In 2022, GE launched the EHS Conversation Series of quarterly videos that promote safety and environmental topics and provide management with materials to support having more engaging and informed safety conversations with their teams.

Finding: Senior management receive safety-specific training

Senior safety executives noted that senior managers should receive rigorous safety-focused training from the beginning and throughout their tenure. This includes thorough orientation programs for new executive management that include briefings on EHS programs and policies and that test management in challenging safety roleplay situations.

Potential leadership action: Ensure that new leaders receive rigorous safety-focused training that is periodically refreshed throughout their tenure

Private sector spotlight: Crowley's "Lead with Safety" initiative

To promote a safer workplace, all Crowley employees are required to undergo both general safety training and safety training tailored to their specific jobs. At the same time, Crowley recognizes that safety goes beyond individual employees. Through its "Lead with Safety" initiative, Crowley's management are trained to do more than merely follow guidelines—they encourage best practices via engaged onsite leadership visits as well as simulation, job shadowing, and leadership training for new hires.

Finding: A successful safety culture empowers employees and incentivizes/rewards reporting safety incidents and hazards

Senior safety executives emphasized the importance of employee empowerment and involvement and noted that incentivizing employees to report concerns and incidents sends a clear message that safety is important. Employees are encouraged to stop work in light of safety concerns and are rewarded for doing so. Many senior safety executives also reward employees for innovative safety ideas.

Potential leadership action: Create an incentive program for safety reporting and reward employees for innovative safety ideas

Private sector spotlight: CF Industries' Wilson Safety Award

Each year, CF Industries, a global leader in hydrogen and nitrogen products, hosts a competition to recognize safety improvements and innovation. Each site across the company nominates an innovative safety initiative to compete for the company's Wilson Safety Award. Finalists are selected by a cross-functional committee of employees and the winner is determined by the senior leadership team. CF Industries selects the winner based on "impact on safety performance and culture, transferability to other sites, ability to be sustained and improved upon, and demonstration of our Core Values."[9]

Private sector spotlight: Georgia Pacific's "Play of the Year"

One way that Georgia Pacific recognizes individual employees is with the "Play of the Year," a concept that started with a sports-themed "Play of the Day." This program recognizes employees for innovative ideas to improve safety practices and is a clear sign that the company's leadership values safety and wants employees to be engaged in safety processes and practices.

One effective use of this program is related to modified tools. Before this program was introduced, modified tools were seen as "bad" because they were nonstandard. Now, modified tools are viewed as a sign that workers do not have what they need to do their job as safely as possible. In one case, an employee modified a tool that management came to recognize as making the job better and safer for the employee. So, they formalized the modified tool, named it after the employee, and made it available to others. This was a source of pride for the employee and a success for the company.

Finding: Senior safety executives should be no more than two levels below the top executive

Many of the senior safety executives with whom we spoke noted that the heads of safety/EHS in their organizations report directly to the CEO. Others noted that the VP of EHS reports to the COO, who reports to the CEO. These leaders noted that this chain of command sends a clear message to the organization that safety is highly valued.

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[9] CF Industries, "The Wilson Award for Excellence in Safety," 2023, https://sustainability.cfindustries.com/our-workplace-and-communities/workplace-health--safety/wilsonaward.

Private sector spotlight: Walt Disney's safety chain of command

Walt Disney's safety efforts are led by its chief safety officer (CSO), who reports directly to the chairman of Walt Disney Parks and Resorts. The CSO provides global oversight for the entire attraction safety program—including ride system design, manufacturing, operations, guest communications, and quality assurance.

Working closely with the CSO to keep its attractions safe is Disney's Global Safety Team, which includes experts from a broad range of disciplines (including engineering, maintenance, operations, facilities, park safety and theme park design) who convene regularly to share best practices across many of Disney's attractions and theme parks.

Finding: Regular internal safety audits and evaluations as well as external audits by organizations such as OSHA are required

Private-sector senior safety executives discussed the importance of performing both internal and external safety audits. They described multitiered audit programs with internal and external audits and assessment teams, noting that these audits are critical to catching near misses before they become incidents.

Private sector spotlight: GE's risk-based approach to safety monitoring

GE implements a broad, risk-based approach to monitoring and evaluating compliance with EHS regulations and GE standards. GE operations are expected to be conducted per routine self-assessments of compliance status and the effectiveness of EHS program implementation. Independent teams—using either external or internal resources—conduct audits of operations on a routine, scheduled basis. GE's audit program includes fixed facilities and locations where GE service personnel maintain equipment at customer sites, as well as projects where GE and its partners execute construction work for customers. Audits are conducted at a frequency that reflects the inherent risk and performance of the operation. The audit includes evaluating and comparing the performance and hazards of an operation with similar

operations. Audits may include jurisdiction-specific compliance requirements, adherence to GE program expectations, and risk mitigation approaches through scenario-based audit tools.

Any noncompliance findings identified in self-assessments, independent audits, or by other methods are entered into GE's online EHS management system and tracked to closure.

Finding: Safety regulators and overseers must have effective methods to assess safety culture

Many of the private-sector companies have overseers or regulators for their specific industries. These regulatory bodies—for example, the Federal Aviation Administration (FAA), the Environmental Protection Agency, and the OSHA—often have a key role in not only setting safety standards, but also monitoring compliance. Although it is a straightforward procedure for regulatory agencies to measure compliance with safety standards like the presence of emergency plans and occupational noise reduction equipment, it is much more difficult to evaluate the *safety culture* of an organization. To properly perform this oversight function, the overseers and regulators require the right set of methods and tools to assess the safety culture. Without these methods and tools, poor safety culture may be left unchecked, leading to negative impacts on individual organizations and in some cases entire industries.

One principal way to prevent the potential cascading effect of poor safety culture is to define clearly the proper methods and tools to perform safety culture evaluation. This follows the classic management observation from Peter Drucker: "What gets measured, gets done." Without an effective evaluation plan for safety culture, it is impossible for overseers to properly monitor, measure, and standardize safety culture.

Researchers often disagree about how safety culture is defined and measured. Thus, there is no one standard safety evaluation method or tool. There are also an array of data gathering techniques, from interviews and surveys to observations and error reports that may contribute to the culture evaluation. Each has its strengths and weaknesses, but an effective safety culture evaluation plan must have construct validity and discriminant validity. That is, for the former, the evaluation must actually measure what is intended to be measured. For the latter, the evaluation must have the power to differentiate between different levels of safety.[10]

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[10] L. Mkrtchyan and C. Turcanu, *Safety Culture Assessment Tools in Nuclear and Non-Nuclear Domains: Review of Safety Culture Assessment Tools*, Belgian Nuclear Research Centre, Open Report SCK•CEN-BLG1085. 2012.

Private sector spotlight: FAA Oversight Failure of Southwest Airlines

In 2015, the FAA issued a regulation requiring all air carriers to develop and implement a safety management system (SMS).[11] As seen in Figure 1, the FAA requires that each SMS have four functional components: safety policy, safety risk management, safety assurance, and safety promotion (which includes safety culture).[12]

Figure 1.   FAA's four SMS components
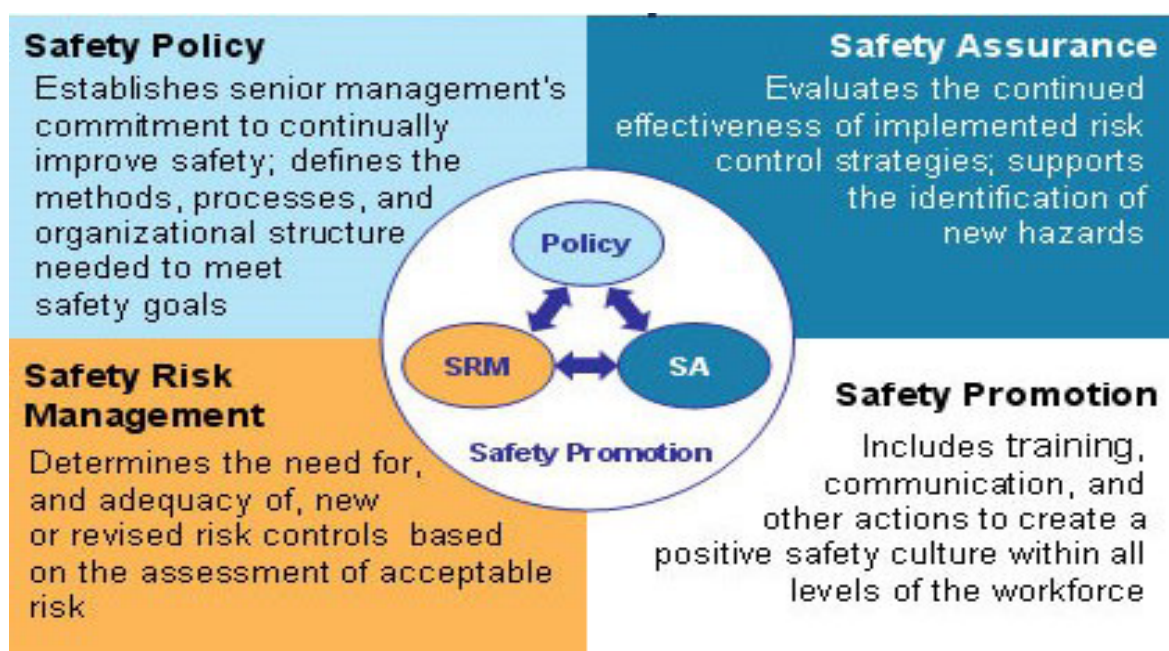
Source: FAA.

The FAA defines safety culture as "the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands."

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[11] US Department of Transportation/Federal Aviation Administration, "Safety Management Systems for Domestic, Flag, and Supplemental Operations Certificate Holders," 14 CFR, Parts 5 and 119 (Docket No. FAA–2009–0671; Amendment Nos. 5–1 and 119–17), *Federal Register* 80, no. 5 (Jan. 8, 2015).

[12] Insights from this section are not directly from conversations with the FAA. Instead, we were directed to this line of discovery through conversations with United Airlines and CNA SMEs.

Despite the FAA's SMS regulation, in 2018 the US Department of Transportation's Office of the Inspector General (DOT OIG) received a hotline complaint about the FAA's oversight of Southwest Airlines. Later that year, Southwest Flight 1380 suffered an engine failure that led to the first US passenger fatality in nine years. DOT OIG launched an investigation into the FAA's oversight of Southwest Airlines and concluded that the FAA inspectors "do not evaluate air carrier risk assessments or safety culture as part of their oversight of Southwest Airlines' SMS."[13] The DOT OIG report recommended 11 actions for the FAA to better oversee Southwest Airlines' SMS. Included in those recommendations was direct guidance to "develop and implement inspector guidance on how to evaluate air carrier safety culture and how it should be factored into oversight decisions." This action underpins how important it is to have an effective framework for safety culture evaluation.

Finding: OSHA's VPP is important for establishing and sustaining a strong safety culture

Senior safety executives whose organizations are members of OSHA's Voluntary Protection Program (VPP) noted that the program encourages a strong safety culture and involves everyone, from frontline employees to management. VPP recognizes employers and workers in private companies and federal agencies who have implemented effective safety and health management systems and maintain injury and illness rates below national Bureau of Labor Statistics averages for their respective industries.

In VPP, management, labor, and OSHA work cooperatively and proactively to prevent fatalities, injuries, and illnesses through a system focused on hazard prevention and control, worksite analysis, training, management commitment, and worker involvement. To participate, employers must submit an application to OSHA and undergo a rigorous onsite evaluation by a team of safety and health professionals. Union support is required for applicants represented by a bargaining unit. VPP participants are re-evaluated every three to five years to remain in the program. VPP participants are exempt from OSHA programmed inspections while they maintain their VPP status.

Some senior safety executives noted, however, that while VPP builds a strong foundation for safety, a safety-focused leader is necessary to take safety culture to the next level.

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[13] US Department of Transportation/Office of Inspector General, *FAA Has Not Effectively Overseen Southwest Airlines' Systems for Managing Safety Risks,* FAA Report No. AV2020019, 2020, https://www.oversight.gov/report/dot/faa-has-not-effectively-overseen-southwest-airlines-systems-managing-safety-risks.

Private sector spotlight: NuStar's VPP Star program

NuStar Energy had its first VPP Star site certified in 1996. Since then, NuStar leadership have been committed to the principles of the VPP program and have made tangible changes in their approach to safety. NuStar found very little long-term resistance to the VPP implementation because employees take ownership of the program and recognize that it is beneficial to them. However, the key to adoption and sustainment is first having manager-leader commitment. The NuStar executive with whom we spoke remarked, "I've been in oil and gas since 1984 and VPP is the best safety program there is."

Safety metrics and data analysis

Finding: Track leading indicators

Senior safety executives noted the importance of tracking both leading and lagging indicators. The latter measure the occurrence and frequency of events that occurred in the past, such as the number or rate of injuries, illnesses, and fatalities. While lagging indicators can alert managers to a failure in an area of their safety and health program or to the existence of a hazard, leading indicators allow managers to take preventive action to address that failure or hazard before it turns into an incident. Leading indicators are proactive, preventive, and predictive measures that provide information about the effective performance of safety and health activities. [14] They measure events leading up to injuries, illnesses, and other incidents and reveal potential problems in safety and health programs. Senior safety executives noted that a strong safety program uses leading indicators to drive change and lagging indicators to measure effectiveness.

One good leading indicator might be the amount of time it takes to respond to a safety hazard report.[3] A decrease in the response time may demonstrate an increased awareness of the importance of workplace safety and managers' commitment to it. Conversely, an increase in response time could signal a lack of management concern, which could mean that hazards are likely to remain uncontrolled and that incidents are more likely to occur. Furthermore,

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[14] Occupational Safety and Health Administration, *Using Leading Indicators to Improve Safety and Health Outcomes,* June 2019, OSHA 3970, https://www.osha.gov/sites/default/files/publications/OSHA_Leading_Indicators_Guidance-07-03-2019.pdf.

workers may decide to discontinue reporting hazards if they feel that management is not being responsive to their concerns.

The senior safety executives we engaged with track the following leading indicators:

- Near-miss reports
- Completion of safety training
- Safety investigations and audit results
- Safety culture improvement action plans
- Ergonomic assessments
- Execution and efficacy of correction action plans
- Hazardous fluid leaks and containment breaches
- Safety system failure events
- Emergency response plan events.

Potential leadership action: Track leading indicators such as completion of assigned training, work stoppages, near-misses, and ergonomic assessments as well as results of quarterly internal audits to identify hazards and establish remediation plans

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Private sector spotlight: Crowley's data- and expert-driven protocols

Crowley recognizes that a goal of eliminating incidents may have the unintended result of discouraging transparency. Hence, Crowley focuses instead on building a solid proactive foundation of safety measured against key performance indicators (KPIs) that target reducing incidents as much as possible and responding effectively when incidents do occur. In 2021, the company initiated a major transition from using lagging indicators to 100 percent leading safety indicators for assessing performance, although injuries and incidents are still monitored. Crowley's safety performance scorecard and various dashboards are accessible for any employee across the company. The company's weighted Safety Performance Index Score is calculated using these key KPIs:

- Lead with safety goals recorded and completed[15]

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[15] Crowley leadership (at the director level and above) in each business unit and corporate division are responsible for conducting quarterly dedicated safety conversations with frontline employees to identify hazards

- Address corrective and preventative actions on time

- Make quarterly progress toward specific safety culture maturity goals[16]

- Complete assigned training on time.

This new digitized system enables Crowley to be more proactive in its safety approach and encourages transparency among all Crowley employees. By tracking these KPIs and continuously evaluating the culture of safety, Crowley strives to prevent incidents rather than respond after the fact.

Finding: Senior safety executives receive safety updates/metrics regularly

Senior safety executives of the companies included in our engagements indicated that the leadership in their respective organizations, including boards of directors, receive regular safety briefings as well as notifications of major incidents through incident messaging systems. The reporting frequency ranges from weekly to monthly and the briefings include safety metrics such as EHS reports and data for the reporting period as well as data trends and year-to-date performance.

We were unable to confirm the details of the metrics presented to senior leadership for *all* companies with whom we held discussions. However, we did receive specific details on metrics reported for several companies. For example, one company indicated that their balanced scorecard is shared monthly with senior leadership and includes both lagging indicators, such as mishap and injury rates, as well as leading indicators of health and safety culture, such as on-time completion of improvement actions, employee engagement activities, and leader engagement activities. Another company also noted that all leading and lagging indicators are shared with senior leadership monthly. Examples of shared leading indicators include ergonomic and process assessments, while examples of lagging indicators include types and number of injuries and incidents (spills, fires, motor vehicle accidents, property damage etc.)

In addition, most companies indicated that their data systems (and in some cases, health and safety dashboards) are accessible to everyone in the organization, so the leadership always has complete access to all safety data and metrics.

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proactively, discuss successes, and identify action items that the employees and leaders can work on together to enhance the safety culture at the site. Crowley holds leaders accountable by ensuring that these visits are completed within the quarter.

[16] Safety culture improvement action plans are monitored and reviewed quarterly for progress and completion. The action plans are developed every two years (or as needed for organizational changes) through a proctored safety cultural assessment with an external leading organizational safety psychologist.

Private sector highlight: GE Aerospace's regular safety briefings and reports

Every Monday, the GE Aerospace senior team receives a safety briefing for the previous week. The briefing includes the number of mishaps and the characteristics of those mishaps. If there's a serious event, the senior team is instantly notified through a crisis management system, and there is a series of root-cause and triage analyses. In addition to the weekly report, every operating leader receives a monthly report, and all employees receive a quarterly report that includes top safety trends.

Finding: Technology plays a critical role in reporting

Senior safety executives noted that technology helps to simplify both incident reporting and program audits. Two examples of useful technology are electronic checklists for critical processes and QR codes for data collection.

Private sector highlight: Cintas' use of QR codes

Cintas strives to simplify safety reporting through technology and to make reporting incidents or hazards a "want-to-do" rather than a "have-to-do." For example, Cintas implemented the use of QR codes across the organization. Employees can log observations or inspections of a facility via QR codes, as well as access safety materials or take safety training using QR codes enabled by mobile devices.

Finding: EHS data is collected and reported but not often used for predictive analysis

All the *Fortune* magazine–ranked companies with which we engaged had safety management information systems to track and record data. In many cases, the systems provided capabilities to facilitate reporting and produce metrics in dashboard formats. Yet they were not using their

safety data to do predictive analytics.[17] That is, they are not using their data to predict when a safety incident is likely to occur.

We should note, however, that although the companies we spoke to don't appear to explicitly use predictive analytics in their safety programs, all the companies we spoke to use the data they collect to examine safety trends and measure progress toward goals. They noted that safety performance can be measured in several ways, usually through a combination of lagging and leading indicators. Companies noted that the data and metrics collected should be tied to specific safety goals and track progress toward those goals, and that as safety goals change, the metrics collected need to change as well. In addition, some companies noted that the data they collect provides meaningful information to develop risk mitigation plans that address issues like hazards, for example, with the most repetitive exposure and type of injuries.

Potential leadership action: Incorporate advanced data analytics to forecast safety trends

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Private sector highlight: American Airlines data science team

One notable exception to this finding is American Airlines, which has a data science team using company data to measure risk in the system and predict when it could lead to a safety incident. Formed in 2021, the American Airlines data science team aggregates layers of data from across the organization to figure out how to measure safety culture over time and the accumulation and acceleration of risk in operations. The company's safety leadership noted that "we have heard for years that the next accident is in the safety data; we just don't know where." American Airlines is pressing to be an industry leader in this area and revolutionize the way the aviation industry thinks about using its data to measure risks.

Safety resourcing and budgeting

Finding: Private sector entities have access to financial resources necessary to address safety issues; thus, they do not discretely budget for safety

Fortune magazine–ranked companies typically do not explicitly budget for safety programs. Although they do devote financial resources toward safety initiatives and continuous

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[17] Several companies indicated that they have parts of the organization performing predictive data analytics, but it is not a core part of how safety data are presently used.

improvement, we were not able to ascertain exact dollar amounts. The general answer given was that company leadership can access the financial resources to address any safety issue with very few restrictions. However, this does not imply that there is a "blank check" for establishing safety programs. Instead, leadership determines what is a reasonable improvement for the amount invested. This is in sharp contrast to the US government, where dollars are explicitly budgeted and spending is tightly controlled.

Summary of safety findings

Table 1 summarizes the findings and potential leadership actions. In most cases, there are roles for both OSD and the individual Services to implement the potential action.

Table 1.   Summary of safety findings

Finding	Potential leadership action
Safety messaging starts with leadership but must be repeated at all levels and in multiple settings	Increase safety engagements during meetings and in overall decision-making
Safety is governed at the highest levels of the company; senior executives, making safety a core value	Ensure that safety is governed at the highest level of DoD and that managers at all levels make safety a core value
Safety meetings/trainings are held in conversational forums	Develop a Department-wide Safety Conversation Series
Senior management receives safety-specific training	Ensure that new leaders receive rigorous safety-focused training that is periodically refreshed throughout their tenure
A successful safety culture empowers employees and incentivizes/rewards reporting safety incidents and hazards	Create an incentive program for safety reporting and reward employees for innovative safety ideas
Senior safety executive should be no more than two levels below the top executive	Ensure that safety designees report to the most senior official at every organizational level
Regular internal safety audits and evaluations as well as external audits by organizations such as OSHA are required	Require robust audit programs throughout DoD and ensure noncompliance findings are tracked to closure
Safety regulators and overseers must have effective methods to assess safety culture	Develop a formal safety culture assessment framework to deploy across DoD
OSHA's VPP is important for establishing and sustaining a strong safety culture	Implement a recognition program like VPP across DoD as part of a comprehensive SMS

Finding	Potential leadership action
Track leading indicators	Track leading indicators such as completion of assigned training, work stoppages, near-misses, and ergonomic assessments as well as results of quarterly internal audits to identify hazards and establish remediation plans
Senior safety executives receive safety updates/metrics regularly	Ensure that senior leaders receive regular safety updates
Technology plays a critical role in reporting	Require electronic data collection and reporting
EHS data is collected and reported but not often used for predictive analysis	Incorporate advanced data analytics to forecast safety trends
Private sector entities have access to financial resources necessary to address safety issues; thus, they do not discretely budget for safety	No specific action can be identified as DoD resourcing differs significantly from private-sector practices.

Source: CNA.

Safety operating philosophies

In addition to the common features of safety programs, we also note two organizational philosophies that several private sector organizations use to underpin their safety management systems. These philosophies provide guidance on how to establish a strong safety culture. OSD should consider these philosophies when making decisions about what level a potential leadership action is most appropriate to implement within DoD.

Organizational safety psychology

Some private sector organizations use a general approach guided by *organizational safety psychology* (or simply *psychological safety*), which is defined as an environment that encourages, recognizes, and rewards individuals for their contributions and ideas by making individuals feel safe when taking interpersonal risks.[18] Essentially, psychological safety is about creating an organizational culture that doesn't punish people for speaking up or making mistakes. When organizations institute a culture of psychological safety, it makes it easier for individuals to participate candidly in occupational safety. For example, workers may be more likely to report a safety hazard if they do not fear retribution.

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[18] Gartner, "Psychological Safety," Gartner Glossary, https://www.gartner.com/en/human-resources/glossary/psychological-safety, accessed July 3, 2023.

Edmondson and Lei break out psychology safety into three levels: individual, organizational, and group.[19] Individuals may have different experiences with psychological safety depending on how they are oriented at each of these levels.

1. Individual level

Individuals in an organization have different levels of social anxiety and threat sensitivity that make them more or less likely to feel psychologically safe at the workplace. The personal characteristics of the individual contribute to what makes them feel psychologically safe and makes it clear that a "one-size-fits-all" mentality will not work. Thus, the willingness to speak up about safety hazards varies with individuals who work in the same corporation.

2. Group level

Within an organization, individuals who work closely together within a team develop shared perceptions of psychological safety. They take cues from the local environment in which they operate most frequently to determine if it is safe to openly share ideas. For example, if several soldiers report that the commanding officer calls them a derogatory name if they report feeling uncomfortable training in unsafe conditions, then the common conclusion is reporting unsafe conditions is viewed negatively.

3. Organizational level

At the organizational level, high-level leadership is key to setting the tone for supportiveness, openness, and tolerance for error. When leadership does not set the correct culture, employees feel anxiety and are less likely to be innovative. This can have a direct negative impact on organizational safety where employees are unwilling to share their ideas on improvements that will make the workplace safer for everyone.

This breakout of psychology safety reflects how important it is for the OSD to consider how safety culture is impacted at DoD's various levels.

Human organizational performance

Several of the senior safety executives with whom we engaged described using *human and organizational performance* (HOP) philosophies to drive their company's safety programs. HOP is essentially about understanding the context and conditions of work. Importantly, HOP is not a program, but rather an operating philosophy that provides a framework for building more resilient organizations.

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[19] Amy C. Edmondson and Zhike Lei, "Psychological Safety: The History, Renaissance, and Future of an Interpersonal Construct," *Annual Review of Organizational Psychology and Organizational Behavior* 1 (2014): 23–43, https://doi.org/10.1146/annurev-orgpsych-031413-091305.

There are five principles within HOP that shape and influence the way organizations think, act, view success, and respond to failure. These principles work together to change the way organizations think about work and how to improve it.[20]

1. People make mistakes

This principle simply acknowledges that error is normal. People can forget things and are sometimes inattentive. Rather than focusing on or trying to stop errors to achieve a "zero-errors" workplace, HOP notes the need to accept that people will make mistakes and to build systems that allow for employees to make errors in in a safe way. HOP notes that an organization can be just one error away from a serious incident or accident but that this is a system problem, not a human problem.

2. Blame fixes nothing

This principle addresses the human tendency to want simple explanations and someone to blame when things go wrong, including when safety incidents occur. While that is a normal, human response, it is not very helpful. HOP recognizes that those involved in accidents and incidents have an important role to play in the process of restoring and learning to create better outcomes for others. By taking blame away, organizations enable better learning.

3. Context drives behavior

In HOP, organizations strive to discover organizational influences and why people make the decisions they do. HOP emphasizes that employees don't go to work with the intention of hurting themselves or other people. If an organization blames the person or fires them for making an error, leadership doesn't learn what it was that made the employee do what they did, thus leaving the same conditions in place for someone else to make the same mistake or error in the future.

4. Learning is vital

Traditional safety approaches have not sufficiently allowed for learning. If companies don't learn about the conditions in which work is happening, they can't change the conditions, and more time is spent fixing the wrong things. HOP notes the need to learn when things go wrong, but to also learn from typical work routines and everyday actions.

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[20] Todd E. Conklin, *The Five Principles of Human Performance: A Contemporary Update of the Building Blocks of Human Performance for the New View of Safety* (Santa Fe, NM: PreAccident Media, 2019).

5. Response matters

In HOP, the word "response" is used deliberately rather than "react." If leaders in an organization manage their response to failure rather than succumbing to knee-jerk reactions that involves blame or judgment, organizations will be more effective.

These five principles of HOP align with the definition of safety culture and could be used to shape how OSD builds its safety culture.

Conclusion

The DoD has an opportunity to learn from the safety policy and practices used in the private sector to create and sustain a strong safety culture. We present several potential leadership actions to move DoD toward an enduring safety culture. Because the scope of this study did not include describing current DoD safety policies and practices, we cannot say which of these potential leadership actions are already underway. Moreover, there are some fundamental differences between the private sector and the DoD, such as a profit motive, key differences in oversight/regulatory agencies, and the ability to secure funding for safety initiatives. These differences will require DoD to adapt some of the potential leadership actions in order to implement them effectively.

Our efforts are not the first time that DoD has attempted to learn about safety practices from the private sector. In a 2004 study for the Naval Safety Center (Streicher and Dolfini-Reed, 2004), CNA identified best practices and made recommendations for ways the Navy could make safety a core value. Many of their findings and recommendations mirror those provided as potential leadership actions in this study. Thus, showing that establishing and maintaining a good safety culture is a difficult task, but there are companies in the private sector that are achieving it. So, it is important that DoD continues to enhance safety programs and advance actions that further institutionalize an enduring safety culture.

Appendix A: List of participating companies

Table 2.   List of participating companies by industry sector

Company	Primary industry sector
AET Tankers	Maritime Transportation
American Airlines	Automotive & Airlines
Bayer	Healthcare/ Pharmaceuticals
Carnival Cruise Lines	Maritime Transportation
CF Industries Holdings	Energy & Gas
Cintas	Commercial Goods Manufacturing
Crowley	Shipping & Logistics
Disney Cruise Lines (a part of the Walt Disney Company)	Maritime Transportation
Flint Hills Resources (a part of Koch Industries)	Energy & Gas
General Electric – Aerospace	Aerospace, Aeronautics, & Aviation
General Motors	Automotive & Airlines
Georgia Pacific	Commercial Goods Manufacturing
Honeywell International	Aerospace, Aeronautics, & Aviation
Lockheed Martin	Aerospace, Aeronautics, & Aviation
Northrop Grumman	Aerospace, Aeronautics, & Aviation
NuStar	Energy & Gas
Phillips 66	Energy & Gas
Pratt & Whitney (a division of Raytheon Technologies)	Aerospace, Aeronautics, & Aviation

Company	Primary industry sector
Royal Caribbean	Maritime Transportation
Sherwin-Williams	Chemical
United Airlines[a]	Automotive & Airlines

Source: CNA.

[a] Due to scheduling conflicts, we were not able to have a full engagement with United Airlines, but we did have a significant initial meeting that led us to investigate other sources of information on the relationship between the FAA and commercial airlines.

Appendix B: C-suite engagement questions

Safety practices: Best ways to create and sustain questions

1. Has your organization or sites within your organization achieved recognition as part of a safety recognition program?

2. What best practices does your organization use to create a culture of safety?

3. What best practices does your organization use to sustain a culture of safety?

4. Who is responsible for safety at your organization? Please describe the line of authority for safety from the business units up to the senior team, CEO, and board. Who revises your line of authority if necessary?

5. How are hazards and safety-related events reported (e.g., by employees, supervisors, or both)?

6. Does your organization have a program to reward staff for improving safety, such as spot awards for excellent work practices or awards for making suggestions that successfully improve safety? If so, please describe the program(s). Do you think they make a difference? If not, what programs have been or could be more effective for improving safety? Have any longer-term programs been successful in rewarding sustained performance or improvements with respect to safety?

7. Does your site or organization take any steps to reward staff for improving safety that are not called out in any SMS recognition program?

8. During major organizational changes (e.g., reorganizations or changes in leadership), are those in new positions of leadership sufficiently informed about safety programs and practices? Is this knowledge transfer done in time (i.e., before the knowledgeable person leaves)? How is safety culture maintained during the transition?

9. How do you incorporate safety messaging?

10. Do you include "at-home" safety messaging (equivalent to off-duty messaging) in your safety program?

11. Does your organization have external collaborations or partnerships with peers/suppliers/academia to improve and assess your safety performance?

Safety metrics: Measuring safety outcomes

1. What types of metrics does your organization use to track and evaluate safety activities and performance? What types of input measures are tracked? Outcome metrics?

2. Do you have a data system for maintaining safety data? If so, do you analyze the data, and what do you do with the analysis?

3. Do you have a case management system to track safety-related events?

4. Do you track how long it takes to remediate hazards?

5. Do you collect data and metrics specifically tied to safety goals? Can you tell whether your safety practices and culture are improving by examining the data and metrics you collect over time?

6. How widely and easily available are these measures or metrics? Can workgroups and business units access them, or is visibility limited to the senior team?

7. Does the senior team spend time reviewing safety metrics as a team? How often and when? Are these meetings attended by the senior team members themselves or by subordinates?

Safety policies: Defining safety philosophy

1. Is there a vision, mission statement, or policy that addresses safety? Is it clearly visible and understood? Where is that vision, statement, or policy located? What goals does it specify?

2. Is there a separate policy on safety culture? Specifically, how does management communicate these policies to the staff? How effective is this communication?

3. Other than policies, how are safety priorities at this organization communicated?

4. How do you balance achieving production goals and safety? Can you give an example?

5. Have you done research into safety-related technologies or applications to make your operations or equipment safer?

Safety program resourcing

1. How do you budget for your safety program?

2. Do you have the ability to increase the safety program budget if needed? If so, how?

VPP membership

1. How long have you been VPP Star certified?

2. Has your organization experienced any challenges or barriers to meeting your safety responsibilities/ maintaining your Star certification? If so, please describe them.

3. Have you ever lost your Star certification? If so, how did you regain it?

4. Do you feel that VPP is what makes the difference in instilling a strong safety culture? If yes, why? If no, why doesn't it?

5. What are your thoughts on other SMS recognition programs?

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Abbreviations

CEO	chief executive officer
CNA	Center for Naval Analyses
COO	chief operating officer
CSO	chief safety officer
DoD	Department of Defense
DOT OIG	Department of Transportation Office of Inspector General
EHS	environment, health, and safety
FAA	Federal Aviation Administration
HOP	human and organizational performance
ISO	International Organization for Standardization
KPI	key performance indicator
OSD	Office of the Secretary of Defense
OSHA	Occupational Safety and Health Administration
SMS	safety management system
SOH	safety and occupational health
VP	vice president
VPP	Voluntary Protection Program

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