Message from the Chair

As I write this column, uncertainties remain about the future of the government budget for the current and future fiscal years. Hopefully, the fiscal issues will soon be resolved (at least in the short term), and those who work for and with the government will have some idea of what future budgets look like.

Your leadership team continues to work on the future of our branch. During the last 6 months, we have welcomed new members to the leadership team, and we welcome others to step up and help as their time permits.

The Naval Safety and Environmental Training Center was planning to hold an annual Navy Safety Conference in San Diego, CA, in March; however, it has been converted to a virtual conference. The Military Branch staffed the ASSE booth at this conference the past 2 years and we were planning to attend again this year, but it looks as though we will not have the opportunity to exhibit now that it will be online.

We hope to see you in Las Vegas, NV, in June for Safety 2013. The Military Branch will partner with the Public Sector Practice Specialty to present a roundtable on the transition process from government/military service to the private sector. We are looking into speakers for our open meeting/networking event that will take place on Tuesday. At Safety 2012, we were privileged to have an excellent speaker from Air Force Space Command who gave a presentation on their procedures for working with NASA to protect the International Space Station from collisions with natural and manmade objects in space. This year, our speaker will probably be someone who works with remotely piloted aircraft safety issues.

While cold weather operations and vehicle issues are appropriate for this time of the year, by the time you read this, it will be time to think about occupational safety and health during hot weather and recreation safety. I know those of you who work for the Department of Defense (DoD) are attuned to occupational safety and health themes for the passing seasons.

The safety and health professionals with whom I work locally are starting to move their private and public sector organizations into the first phase of the implementation for the revised hazard communication standard. While this upgrade project has been spread over multiple years, now is not the time to get “behind the power curve.” If you identify good training resources, please share them with the rest of the group on LinkedIn. Click here for a HazCom webinar provided by the Industrial Hygiene Practice Specialty.

In summary, we want to continue to grow the Military Branch. We need your help to do that. If you can make time in your busy schedule, here are some ways you can help:

- Recruit your peers who work for or with the DoD or are veterans (or otherwise interested in military safety and health) to join the Military Branch.
Volunteer Advisory Committee

Chair
Chris Gates
cgates1@roadrunner.com

Vice Chair
Robert Barnette
robert.barnette@honeywell.com

Secretary
Tom Loughman
thomas.loughman@urs.com

Publication Coordinator
Shawn Lewis
shawn.lewis@tsc.com

Conferences & Seminars
Pam Wilkinson
psheirer@gmail.com

Membership
Joshua Franklin
joshua.franklin@us.af.mil

Web & Social Media
Robert Barnette
robert.barnette@honeywell.com

Body of Knowledge
David Barragan
david@besrm.com

Awards & Honors
George Pearson
gwpearson@comcast.net

- If you are not a member of the Military Branch’s LinkedIn group, join and contribute to it.
- Tell us about planned gatherings of military-related safety professionals. If you know a member of the organizing committee, that information would be useful so that we can ask about having an ASSE exhibit.
- Volunteer to be a member of the Military Branch leadership team. We have primary contacts for most of the emphasis areas, but these change on occasion, and we are always looking for more committee members.
- Write on safety and health and/or SH&E management issues in your current or past working life for this publication. If you have questions, please contact Shawn Lewis, our publication coordinator.
- Contribute material to the Body of Knowledge. Joshua Franklin can help you with the process.

Best Regards,

Christopher M. Gates, ARM

System Safety in the Acquisition Process: What Are the Tasks in MIL-STD 882-E & What Do We Do With Them?

*By Pamela K. Wilkinson*

Contractor system safety programs are established as part of contractual obligations. Previous 882 series Military Standards (MIL-STD) contained specific tasks to be accomplished by the contractor to fulfill the government’s system safety requirements. However, with the move to performance standards, those tasks were removed from MIL-STD-882D. Much of the decisions on how to comply were left to the contractor or for the government to use other requirements, such as data item descriptions (DIDs), within contracting documents.

With the revision to MIL-STD-882E, specific tasks have been reestablished. The major challenge is the proper selection of the specific tasks that can aid in attaining cost-effective information necessary for the program’s needs. This article attempts to provide guidance to system safety practitioners who may not have previously used these tasks within the acquisition process. This article also discusses how to tailor specific tasks to fit the level of effort required for the size and complexity of the product while still maintaining the necessary safety of the system.

**Background**

Within the Department of Defense (DoD) community, system safety is defined as “the application of engineering and management principles, criteria and techniques to achieve acceptable mishap risk, within the constraints of operational effectiveness and suitability, time and cost, throughout all phases of the system lifecycle.”

System safety’s objective is developing systems as free of hazards as realistically possible. “The goal of system safety is the protection of life, systems, equipment and the environment” (Ericson, 2005). Before evaluating what level of risk exists in the system, developing and applying mitigation strategies, and finally accepting the level of risk that remains, one must first seek to understand the system analyzed to identify what specific hazards exist. The best place to begin that understanding of the specific system and identification of inherent hazards is with the engineers and managers building the system. Thus, for those buying the system or product, system safety must begin as an early procurement activity.
Early documents, such as U.S. Air Force Military Specification (MIL-S)-38130, released in 1963, recognized a need for system safety to begin with procurement as an industry activity. When MIL-STD-882 was first introduced in July 1969, it introduced detailed contractor tasks to be included in procurement documentation to ensure early hazard identification, assessment, mitigation and management. Since MIL-STD-882 was also the most comprehensive to-date as far as scope of applicability and effort, it introduced tailoring of specific tasks across various lifecycle phases to adjust for the complexity and size of various program needs (Air Force Systems Command, 2000). Each update to MIL-STD-882 (DoD System Safety, 1993) through the 1990s included the expansion of specific tasks to include both hardware and software assessments, as well as more detail on tailoring tasks for lifecycle phases and program complexity.

As systems became more complex and the need to develop cutting-edge solutions became more and more necessary, DoD began to reform the acquisition process from a prescriptive approach that specified exactly how something was to be built to one that was based on specific performance parameters. This allowed for more innovation from industry on exactly what was built, so long as it performed to specified DoD needs. While the need for system safety was never questioned, it was perceived that the procurement tasks were no longer applicable. MIL-STD-882D (DoD System Safety, 2000) was published as a performance-oriented military standard with the tasks removed. Programs began developing and using specific DIDs to request necessary procurement documentation, such as safety assessment reports or a safety program plan. It quickly became clear that effective system safety often required more. For the last 12 years, there have been various efforts to once again update MIL-STD-882. Finally, on May, 11, 2012, MIL-STD-882E was signed, once again reintroducing a list of tasks, this time as an option rather than a requirement.

Many of the standards and guidance documents referenced in this article were canceled when MIL-STD-882D went into effect. Thus, much of the information on properly tailoring the system safety sections of a request for proposal (RFP) and statement of work (SOW) has been lost to safety professionals in the last 12 years. However, the previous guidance within these canceled standards and handbooks are once again applicable with the introduction of MIL-STD-882E.

Many system safety professionals entered the government and support workforce in the last 12 years, never learning to use the tasks in versions previous to MIL-STD-882D. However, MIL-STD-882E does not adequately explain how to effectively use and tailor the reintroduced tasks. This article attempts to introduce the basics of task usage and tailoring to those professionals.

**Tasks**
The tasks specified in MIL-STD-882E include three parts: the “Purpose,” “Task Description” and “Details to Be Specified.” The Purpose provides the reason the task must be performed. The Task Description includes all of the subtasks that make up the task the contractor must perform. This section should be tailored to include only those subtasks that are necessary depending on the complexity and lifecycle phase of the system. The Details to Be Specified section lists specific information that may be necessary for inclusion in the RFP and SOW.

**Note:** A typical RFP is made up of the contract, which includes a statement of objectives or SOW and associated contract data requirements lists (CDRLs) and draft performance specification (Sections C and J), as well as a preliminary work breakdown structure, evaluation factors (Section M) and instructions to offerors (Section L). The RFP defines the program and is the basis for the contract (DoD, 2006).

The system safety section of the SOW should be tailored to the acquisition
Ergonomics Practice Specialty

The Ergonomics Practice Specialty (EPS) first began in 2007. EPS serves as a premier source of ergonomics information for ASSE members. In addition to publishing its triannual online publication Interface, EPS maintains an extensive listing of ergonomics resources on its website and is raising funds for an Ergonomic Scholarship to be offered by the ASSE Foundation. It also sponsors ergonomics-related sessions at ASSE’s annual Professional Development Conference and finds ways for EPS members to take part in National Ergonomics Month each October.

To join this popular practice specialty, visit www.asse.org/JoinGroups.

Connect with EPS at www.asse.org/ps/ergonomics and on LinkedIn.

Program's specific needs. However, if the task is contractually required, the specific sections of the Details to Be Specified marked with an “(R)” is required and must be included in the RFP or SOW (DoD System Safety, 1993; DoD System Safety, 2012).

It is important to remember that all tasks reintroduced in MIL-STS-882E are optional. If MIL-STD-882E is required in a solicitation or contract but no specific tasks have been specified, then only the general requirements and definitions sections must be complied with. Each desired task must be specified via contracts generally in a SOW and CDRL. All but one of the tasks originally listed in MIL-STD-882C have been kept, although in a number of cases renamed and upgraded. Additionally, four new tasks have been added (DoD System Safety, 2012).

To be most cost-effective, each task will need to be selectively applied and tailored to fit the lifecycle phase and complexity of the program effort. While the safety portion of a contract is a relatively small cost portion of the total procurement effort, one should only ask for the minimum necessary to effectively identify and assess hazards. However, because none of the tasks require other tasks as prerequisites, each desired task must be specifically included in a contract (DoD System Safety, 2012).

According to MIL-STD-882E, the tasks are numbered according to the function of that task as follows.

Task 100 Series—Management

TASK 101 – Hazard Identification and Mitigation Effort Using the System Safety Methodology
TASK 102 – System Safety Program Plan
TASK 103 – Hazard Management Plan
TASK 104 – Support to Government Reviews/Audits
TASK 105 – Integrated Product Team/Working Group Support
TASK 106 – Hazard Tracking System
TASK 107 – Hazard Management Progress Report
TASK 108 – Hazardous Materials Management Plan

Task 200 Series—Design & Integration

TASK 201 – Preliminary Hazard List
TASK 202 – Preliminary Hazard Analysis
TASK 203 – System Requirements Hazard Analysis
TASK 204 – Subsystem Hazard Analysis
TASK 205 – System Hazard Analysis
TASK 206 – Operating and Support Hazard Analysis
TASK 207 – Health Hazard Analysis
TASK 208 – Functional Hazard Analysis
TASK 209 – System-of-Systems Hazard Analysis
TASK 210 – Environmental Hazard Analysis

Task 300 Series—Evaluation

TASK 301 – Safety Assessment Report
TASK 302 – Hazard Management Assessment Report
TASK 303 – Test and Evaluation Participation

Task 400 Series—Verification

TASK 401 – Safety Verification
TASK 402 – Explosives Hazard Classification Data
TASK 403 – Explosive Ordnance Disposal Data
The major challenge for an acquisition program is to make it cost-effective and to schedule appropriate selections of only those system safety tasks that will add value in meeting program safety requirements based on identified program needs and lifecycle phase. A rather simple acquisition program of well-established commercial-off-the-shelf items may only require a SAR and hazard tracking system. Developmental items, complex equipment and weapons systems would require more.

Most tasks represent required documents, such as plans and reports, that assist in determining the safety of the system being procured. However, one task relates to contractor support roles at integrated product team meetings. Given the amount of reports and other documents to choose from, one can quickly see where such submissions represent a major portion of the contractor’s safety effort and can quickly become expensive. Thus, an acquisition program must be careful to 1) choose tasks that are appropriate to the specified lifecycle phase, 2) choose the minimum required tasks for the effort and 3) tailor the chosen tasks to avoid redundant and unnecessary information. However, unless specific data or required documents are included in the contract, an expensive contract modification will likely be necessary before the contractor will provide it, as they rightly will want to be paid for the work involved. Be sure to carefully read each task carefully so as to include only those tasks necessary and only those portions of the applicable tasks to ensure system’s safety.

The following list (Air Force Systems Command, 2000) is to aid in determining which task to use in which lifecycle phase. However, depending on the program, much latitude in this list may be necessary.

<table>
<thead>
<tr>
<th>Task</th>
<th>Title</th>
<th>Phase 0</th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
<th>Phase IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Hazard Identification and Mitigation Effort Using the System Safety Methodology</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>102</td>
<td>System Safety Program Plan</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>Hazard Management Plan</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>104</td>
<td>Support to Government Reviews/Audits</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>105</td>
<td>Integrated Product Team/Working Group Support</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>106</td>
<td>Hazard Tracking System</td>
<td>S</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>107</td>
<td>Hazard Management Progress Report</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>201</td>
<td>Preliminary Hazard List</td>
<td>G</td>
<td>S</td>
<td>S</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>Preliminary Hazard Analysis</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>GC</td>
<td>GC</td>
</tr>
<tr>
<td>203</td>
<td>System Requirements Hazard Analysis</td>
<td>G</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>GC</td>
</tr>
<tr>
<td>204</td>
<td>Subsystem Hazard Analysis</td>
<td>N/A</td>
<td>G</td>
<td>G</td>
<td>GC</td>
<td>GC</td>
</tr>
<tr>
<td>205</td>
<td>System Hazard Analysis</td>
<td>N/A</td>
<td>G</td>
<td>G</td>
<td>GC</td>
<td>GC</td>
</tr>
<tr>
<td>206</td>
<td>Operating and Support Hazard Analysis</td>
<td>S</td>
<td>G</td>
<td>G</td>
<td>GC</td>
<td>GC</td>
</tr>
<tr>
<td>207</td>
<td>Health Hazard Analysis</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>GC</td>
<td>GC</td>
</tr>
<tr>
<td>208</td>
<td>Functional Hazard Analysis</td>
<td>S</td>
<td>G</td>
<td>G</td>
<td>GC</td>
<td>GC</td>
</tr>
<tr>
<td>209</td>
<td>System-of-Systems Hazard Analysis</td>
<td>N/A</td>
<td>G</td>
<td>G</td>
<td>GC</td>
<td>GC</td>
</tr>
<tr>
<td>210</td>
<td>Environmental Hazard Analysis</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>GC</td>
<td>GC</td>
</tr>
<tr>
<td>301</td>
<td>Safety Assessment Report</td>
<td>S</td>
<td>G</td>
<td>G</td>
<td>GC</td>
<td>GC</td>
</tr>
<tr>
<td>302</td>
<td>Hazard Management Assessment Report</td>
<td>S</td>
<td>G</td>
<td>G</td>
<td>GC</td>
<td>GC</td>
</tr>
<tr>
<td>303</td>
<td>Test and Evaluation Participation</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>304</td>
<td>Review of Engineering Change Proposals, Specification Change Notices, Deficiency Reports, Mishap Investigations and Requests for Deviation/Waiver</td>
<td>N/A</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>401</td>
<td>Safety Verification</td>
<td>S</td>
<td>G</td>
<td>G</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>402</td>
<td>Explosives Hazard Classification Data</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>403</td>
<td>Explosive Ordnance Disposal Data</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
</tbody>
</table>
Upcoming Live Webinars

Actively Caring for People
March 6, 11:00 am-12:30 pm (CST)

Best Practices in Industrial Hygiene
March 20, 11:00 am-12:30 pm (CDT)

Nanotechnology: Revolutionizing Occupational Safety & Health
April 10, 11:00 am-12:30 pm (CDT)

Risk Management is More Than Safety
April 24, 11:00 am-12:30 pm (CDT)

On-Demand Offerings

Making Metrics Matter

Safety Issues in the Upstream Oil & Gas Sector

Best Practices in Fire Safety

Program Phase
0 – Pre-Acquisition
I - Concept Exploration
II – PDRR
III - Eng/Manufacturing/Development
IV - Production/Deployment Design
Changes Only
V - Operations/Support

Applicability Codes
S - Selectively Applicable
G - Generally Applicable
GC - General Applicable to Design Changes Only
N/A – Not Applicable

Tailoring
Tailoring is “the process by which the individual requirements (sections, paragraphs or sentences) of the selected specifications and standards are evaluated to determine the extent to which each requirement is most suitable for a specific materiel acquisition and the modification of these requirements, where necessary, to ensure that each tailored document invoked states only the minimum needs of the government” (DoD, 1979).

Too often, whole requirements are cited within the SOW, with no tailoring. This often results in unnecessary extra work for the contractor and thus passed-on additional expense for the program (DoD, 1979). As noted in DoD (1993), “Overstating data requirements contained in data acquisition documents in contracts often leads to increased cost and delay in delivery. This misapplication can be attributed to past emphasis on achieving maximum performance regardless of cost; to the attitude that data acquisition documents, as published, were mandatory and had to be totally applied; and to the lack of emphasis on tailoring or streamlining of those documents to a specific need.”

Tailoring should eliminate those tasks or sections of tasks that would add non-value-related costs to the program. Tailoring is based on the program and program phase, the system’s complexity and/or stability, program urgency and level of risk the program is willing to accept. However, sufficient tasking must remain to provide confidence in the system’s safety for all foreseeable mission scenarios.

When tailoring for specific tasks, one must also be aware that while contractors want to avoid serious hazards that may cause performance slips or liability for accidents, letting safety issues go until a later point, to be dealt with as an engineering change proposal, may allow the contractor more profit (U.S. Navy, 1995).

A program will need to determine exactly which tasks are necessary to obtain the information (analyses, reports, etc.) necessary to ensure that all hazards have thoroughly been identified and that the system’s safety is ensured. Once the necessary tasks have been determined, each task must be thoroughly read, then required portions of each task noted as well as any redundancy in requirements.

Begin planning as early as possible to allow for enough time to do a comprehensive review of the data needs, the acquisition strategy and the tasks themselves well before the scheduled RFP release (DoD 5010.12-M). To effectively choose appropriate tasks and subsequent tailoring of the selected tasks, one must first understand the product or system procured and what analyses will uncover potential hazards and will provide the necessary information to build a safety case. The acquisition strategy, requirements traceability matrix and WBS are just some of the acquisition planning documents that may prove helpful. Read and fully understand the purpose section of each task before attempting to apply any of the tasks (Air Force Systems Command, 2000).
Once the appropriate tasks are selected that apply to the complexity and lifecycle phase of the system, the next thing to consider is the timing of the document delivery needs to be considered. Some tasks, such as Task 102 and 103, should be delivered with the proposal; some tasks may only need to be delivered once during the lifecycle phase or contract period, such as Task 201. Some may be required updates on a regular schedule, such as Task 107. The timing of tasks deliveries is important. If a document, such as Task 301, the Safety Assessment Report, is scheduled too late in the lifecycle phase, engineering changes may be difficult and more costly. Table 1 (Air Force Systems Command, 2000) outlines various tasks that may be appropriate for each lifecycle phase.

Next the specific tasks themselves must be tailored. One must also look carefully at the task descriptions for redundant information requirements and other areas that can be combined or those that can be removed due to unnecessary or inapplicable data requirements.

**SOW, CDRL & DID**

A SOW (Section C of the RFP) outlines all documents, meetings, test events and the like that are important to the acquisition process. For the system safety engineer, it is the only means available to gain the necessary information from the contractor to effectively analyze the system being procured. Remember, a SOW is used to tell a prospective contractor what is to be done, not how it is to be done. According to the Federal Aviation Administration, while the SOW does not go into great detail, the SOW must contain enough detail to tell the contractor exactly what kind of information is required. DoD (1996) states:

“**A well-written SOW enhances the opportunity for all potential offerors to compete equally for government contracts and serves as the standard for determining if the contractor meets the stated performance requirements...The SOW should specify in clear, understandable terms the work to be done in developing or producing the goods to be delivered or services to be performed by a contractor. Preparation of an effective SOW requires both an understanding of the goods or services that are needed to satisfy a particular requirement and an ability to define what is required in specific, performance-based, quantitative terms. A SOW prepared in explicit terms will enable offerors to clearly understand the government’s needs. This facilitates the preparation of responsive proposals and delivery of the required goods or services. A well-written SOW also aids the government in conduct of the source selection and contract administration after award.”**

The relationship between tasks, CDRLs and DIDs is often confusing. It is helpful to remember that:

- **Tasks** describe those specific pieces of information in the required documents contractor is to provide.
- **CDRLs** outline the specific timing for delivery of the documents (e.g. frequency, delivery schedule, etc.).
- **DIDs** describe the required format of those documents.

With the removal of tasks from MIL-STD-882D, some DIDs were revamped so they could also be used to require specific information in contractor documentation. Thus, some DIDs will also need to be tailored to align with its associated task. While both tasks and DIDs can be tailored by removing portions of descriptions and details to be specified, tasks play an important role because you are allowed to include additional verbiage.

As stated, the task description should be tailored to include only those subtasks that are necessary depending on the system’s complexity and lifecycle phase. Like MIL-STD-882C, subtasks can be added, although supporting rational should
Hurricane Sandy Recovery Efforts

ASSE provides key information for post-Hurricane Sandy recovery and rebuilding efforts as well as emergency preparation tips. Information from federal agencies and the Red Cross includes activities commonly performed and provides detailed information about the hazards associated with those activities from OSHA, flooding and weather information, working in and around damaged buildings, industrial hygiene tips and much more. Click here for more information.

ASSE and OSHA seek PPE donations for Hurricane Sandy cleanup and recovery workers. Click here for more information on the PPE needed and contact information for sending donations.

Most of the tasks within MIL-STD-882E require some sort of report or document that will need to be delivered to the government. These are referred to as deliverables. The details for delivery requirements are included in the CDRL, DD Form 1423. The date the document must be delivered, the number of deliveries necessary and the format for delivery are all important and must be stated in the CDRL. The system safety professional should make every effort to ensure that the specific data required will in fact be generated and available prior to the proposed delivery date stated on the CDRL. These delivery requirements are specified in Blocks 10, 11, 12 and 13. Who receives the deliverable is specified in Block 14.

The required format for the deliverable is also important. DIDs define that format. The DID number is specified in Blocks 1, 2 and 3. The specific requirement (e.g., “MIL-STD-882E, Task 102”) is entered in Block 4. See Table 2 for guidance on which DIDs may be used to support specific tasks. Other available DIDs may also apply. Consult your acquisitions team for additional assistance. Per MIL-STD-882E (DoD System Safety, 2012), “The Acquisition Streamlining and Standardization Information System database should be researched at https://assist.dla.mil/quicksearch to ensure that only current and approved DIDs are cited on the DD Form 1423.”
Table 2 gives some examples of possible DIDs that can be used with each task. This list is not exhaustive and other DIDs may also apply. Remember to carefully tailor each DID as necessary to align with the specifically tailored task.

<table>
<thead>
<tr>
<th>Task</th>
<th>Title</th>
<th>DID Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Hazard Identification and Mitigation Effort Using the System Safety Methodology</td>
<td>DI-SAFT-81626B</td>
<td>System Safety Program Plan</td>
</tr>
<tr>
<td>102</td>
<td>System Safety Program Plan</td>
<td>DI-SAFT-81626B</td>
<td>System Safety Program Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DI-SAFT-80105B</td>
<td>System Safety Program Progress Report</td>
</tr>
<tr>
<td>103</td>
<td>Hazard Management Plan</td>
<td>DI-ENV-81840</td>
<td>Programmatic Environmental Safety and Health Evaluation (PESHE) Plan</td>
</tr>
<tr>
<td>104</td>
<td>Support to Government Reviews/Audits</td>
<td>DI-SAFT-80105B</td>
<td>System Safety Program Progress Report (SSPPR)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(If reports are required)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(If reports are required)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DI-SAFT-80102B</td>
<td>Safety Assessment Report (SAR)</td>
</tr>
<tr>
<td>201</td>
<td>Preliminary Hazard List</td>
<td>DI-SAFT-80101B</td>
<td>System Safety Hazard Analysis Report (SSHA)</td>
</tr>
<tr>
<td>202</td>
<td>Preliminary Hazard Analysis</td>
<td>DI-SAFT-80101B</td>
<td>System Safety Hazard Analysis Report (SSHA)</td>
</tr>
<tr>
<td>203</td>
<td>System Requirements Hazard Analysis</td>
<td>DI-SAFT-80101B</td>
<td>System Safety Hazard Analysis Report (SSHA)</td>
</tr>
<tr>
<td>204</td>
<td>Subsystem Hazard Analysis</td>
<td>DI-MISC-80508B</td>
<td>Technical Report, Study/Services</td>
</tr>
<tr>
<td>205</td>
<td>System Hazard Analysis</td>
<td>DI-SAFT-80101B</td>
<td>System Safety Hazard Analysis Report (SSHA)</td>
</tr>
<tr>
<td>207</td>
<td>Health Hazard Analysis</td>
<td>DI-SAFT-80106B</td>
<td>Health Hazard Assessment Report</td>
</tr>
<tr>
<td>208</td>
<td>Functional Hazard Analysis</td>
<td>DI-ILSS-81495</td>
<td>Failure Mode Effects and Criticality Analysis Report</td>
</tr>
<tr>
<td>210</td>
<td>Environmental Hazard Analysis</td>
<td>DI-MISC-80508B</td>
<td>Technical Report, Study/Services Programmatic Environmental Safety and Health Evaluation (PESHE) Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DI-ENVIR-81840</td>
<td></td>
</tr>
<tr>
<td>302</td>
<td>Hazard Management Assessment Report</td>
<td>DI-MISC-80370</td>
<td>Safety Engineering Analysis Report</td>
</tr>
<tr>
<td>303</td>
<td>Test and Evaluation Participation</td>
<td>N/A</td>
<td>No DID unless a report, meeting minutes, analysis, or other document is required</td>
</tr>
<tr>
<td>401</td>
<td>Safety Verification</td>
<td>DI-SAFT-80102B</td>
<td>Safety Assessment Report (SAR)</td>
</tr>
<tr>
<td>402</td>
<td>Explosives Hazard Classification Data</td>
<td>DI-SAFT-81299B</td>
<td>Explosive Hazard Classification Data</td>
</tr>
<tr>
<td>403</td>
<td>Explosive Ordnance Disposal Data</td>
<td>DI-SAFT-80931B</td>
<td>Explosive Ordnance Disposal Data</td>
</tr>
</tbody>
</table>
Given that the tasks can be tailored by adding sections, it may be possible to simply use the tasks in place of the DID as the authority in Block 4 by adding any specific formatting requirements (or “contractor format acceptable”) when tailoring. Consult with the acquisition/contracting people on your team for guidance on this possibility. Any specific format requirements should then be detailed in Block 16 of the CDRL.

**Conclusion**

In the necessary balance between desired safety of the system and a program’s cost, schedule and performance constraints, information is key. MIL-STD-882E is that information roadmap for both the government buyer and contractor seller. The buyer must give careful consideration to the complexity and lifecycle phase of the program, as well as to the information necessary and rigor of analysis required to build a case for the program’s safety. Once the tasks have been appropriately chosen, tailored and included in a SOW, MIL-STD-882E becomes the roadmap of necessary analyses tools and required documentation the seller must complete to ensure their system’s safety. This information, coupled with both the government and contractor working together, can knowledgeably reduce the potential risks of a system to an acceptable level.

It takes practice and a good understanding of the system procured to develop the skill necessary to appropriately tailor the tasks in MIL-STD-882E. This article did not go into a detailed discussion of tailoring each specific task, as all programs’ needs are different. It is the author’s hope, however, that this article gives the reader enough information to begin. As the system safety professional integrates more within the early acquisition process, the effort will become easier.

**References**


Pamela K. Wilkinson, is the technical director of system safety/ESOH at QinetiQ North America. She has more than 20 years’ safety experience and currently serves on ASSE’s Military Branch Advisory Committee.

Checklist Mentality: It’s a Good Thing
By Gary S. Rudman, CSP

We often hear the safety officer discuss at staff meetings a mishap where checklists were not used. Checklists are not only required in the flying and maintenance environment, but actually apply to most of our professional and personal activities.

We are told during all phases of life what to do and how to do it. For example, parents might help their children learn how to clean their room by making a list with tasks, such as, “Place your toys in the basket.” While simple, the basics start to become engrained in children. Upon successful completion of the tasks, parents might reward the child with ice cream or a monetary award, such as an allowance. The simple feedback system may help the child learn. The child may then remember to follow the checklist the next time s/he is asked to complete that task. In this case, the child has a written plan and direction.

As the child grows older and wiser, the parents broaden the guidelines. The child becomes a teenager and may begin to see the world from a different point of view, a world where there is no need for checklists. In reality, the teen continues to depend on checklists. School checklists detail homework assignments, sports practice times and band competitions, all complete with schedules. Internal checklists reside within those: What do I need to take to band competition? How will I make sure I am adequately trained for my half-marathon? What training plan do I need to follow? Some teenagers might seek additional guidance from a parent, coach or teacher. With the guidance, usually provided in a step-by-step format, such as a checklist, the teenager is set on the right path. The teenager then has the tools necessary to accomplish the task at hand. The teenager is relearning through patience, with detailed and complete direction.

Next comes graduation from high school and college and then entry into the real world. Perhaps for some, all that has been learned is quickly discarded. For others, the successful and the eager, nothing is thrown away. They use the path that has been learned.

The use of tools gained from lessons learned is key to a successful future on personal and professional levels. Consider entering pilot training or technical school, buying a car or boat or assembling a barbecue grill. Each requires attention to specific detail. Checklists, simple or complex, are involved in each operation to ensure success.

Checklists incorporate lessons learned. For example, running a car without engine oil will result in catastrophic damage and a high repair bill, while checking the engine oil can prevent the damage and expense. Flying and maintenance training involve considerable complex issues. Have you ever thought how many checklists are involved in getting an airplane off the ground or completing the engine change operation? How much have you learned? What has become engrained over the years? Did your predecessor
adequately mentor you so that his/her lessons learned could be passed down?

Most checklists do not require an extensive period of time to complete. Checklists detail hazards that, if not precisely followed, could result in an injury or death. The majority of the notes, warnings and cautions have been written in blood. Still, there are times when checklists are not used. The end result could be a Class A mishap.

The operator could be found causal for not running the “before landing gear checklist.” How many times have you put the gear up and put the gear down? Once without a checklist is a lapse in reason.

I enjoy time on the lake with the family. All want to get going quickly. There is no time to check the oil to ensure that the engine’s fluids are at appropriate levels. Wrong! I make it a point to do a 5-minute inspection of my engine compartment every time I take the boat out. One day during my “preflight inspection,” I noticed the outdrive gear lube reservoir was low and fluid was collecting in the bilge compartment. Before leaving the dock, I topped off the reservoir and continuously checked the levels during the day. Had I not taken the time, had I not been patient, my beautiful day on the lake would have been ruined and would have resulted in an expensive repair bill. The next day, the boat was serviced, and the hairline crack in a connector was fixed.

So, take the time, usually just a few minutes, to safely complete whatever the task at hand. Be patient; the world can wait a short time. Your family, friends and coworkers look to you to ensure success in your daily accomplishments. Complete the checklists at work and at home.

Gary S. Rudman, CSP, is the deputy director of safety for the 9th Air Force and U.S. Air Forces Central Command, Shaw AFB, South Carolina. He was commissioned through the Air Force Reserve Officer Training Corps in 1988 on the USS Constitution (Charlestown Navy Yard). He has flown a variety of airframes, including the B-52G, EC-130E/H and T-43A. Rudman instituted the "Pilot for a Day Program" at Davis-Monthan AFB, AZ, a community program reaching out to seriously ill children. He served as a presidential advance agent, coordinating logistical arrangements for Air Force One. Rudman retired from Air Force active duty in 2011 as a lieutenant colonel. Rudman holds a B.S. in Aerospace Engineering from Boston University and an M.A. in Organizational Management from University of Phoenix.

System Safety & the Unintended Consequence
By Clifford C. Watson, CSP

The analysis and identification of risks often result in design changes or modification of operational steps. This article identifies the potential of unintended consequences as an overlooked result of these changes. Examples of societal changes, such as prohibition, regulatory changes, including mandating lifeboats on passenger ships, and engineering proposals or design changes to automobiles and spaceflight hardware are used to demonstrate that the system safety engineer (SSE) must be cognizant of the potential for unintended consequences as a result of an analysis.

Conclusions of the report indicate the need for additional foresight and consideration of the potential effects of analysis-driven design, processing changes and/or operational modifications.
Welcome New Members

We want to thank everyone who has remained a loyal member of the Military Branch and welcome the following members who recently joined. We currently have nearly 150 members.

If you have colleagues who might be interested in joining the branch, please direct them to www.asse.org/JoinGroups.

If you know anyone who might be interested in joining ASSE, have them contact customer service.

Stephen Curry
Clint Gale
Philip Kemp, USAF Inspection Agency
Elizabeth Kvammen, Alutiq
Barry Mackall
Joseph Maute
Thia Nilawat
Bineesh P.
Shawn Palmer, U.S. Federal Services
James Pautler
Brendan Pizzala
Jesse Puckett
Beau Voelkel
Katie Whited, URS
Todd Woodbury
Mylee Williams
Branden Wilson
Moses Wilson

Introduction

In today’s complex world, the SSE plays an important role when using hazard analyses, failure modes and effects analyses and other tools that ferret out the issues that may lead to system failures. It is possible to ask for or require changes to design, implementation of operational controls and even hardware modifications that may create an unintended consequence. Traditional analysis tends to be rigid; management often tells us, “If you bring me a problem, bring me a solution.” And so, we sometimes offer fixes that may not be the best solution; in fact, they may lead to serious consequences.

Unintended Consequences in History

You are boarding the **SS Eastland**, a passenger ship built in 1903, while it is docked at a Chicago pier on the Chicago River. The date is July 24, 1915. You, and more than 2,500 other passengers, are embarking on a trip to a company picnic in Indiana. You make your way to the upper deck so you can wave and wish goodbyes to your friends on the dock. Suddenly, the boat begins to list; it rolls to port and 844 people die, either from drowning or from being crushed by furniture in the cabins they occupied. Ironically, the 1915 Seaman’s Act had been passed earlier that year as a result of the loss of the RMS Titanic. The act required the addition of lifeboats to the Eastland, which added to the problem of listing that the ship was known for. Good intentions, exacerbated by poor design and newly imposed regulations, were listed as likely contributors to the loss of life.

It is early August 1919. You are 22 years old and a veteran of the Great War; a war recently ended with the Treaty of Versailles. You are thirsty and go to the ice box. You are looking for a cold bottle of beer, but it is several months after the Eighteenth Amendment to the U.S. Constitution was passed, making the manufacture, transport or export of liquor illegal. So what do you do? You walk down the dusty street of your town and visit the mercantile store. You nod to the owner and walk past the row of dry goods toward the door marked “Men Only” pushing the door open. Then you knock on the righthand wall, and the wall opens to a backroom where you buy a bootleg brew and cool off along with several of your fellow war hero friends. Suddenly, there is a commotion outside and the sheriff, along with several deputies, barges through the door. As the ruckus subsides, the sheriff has arrested all of the veterans and has smashed the keg of beer.

So it went. Good intentions led to formerly legal activities being classified as illegal. Gunfights, deaths, broken families and an underground business that sprung up from the legislation denied the government of taxes while supporting the illegal bootlegging industry.

Fast-forward to the 1970s when environmentalists raised the issue of smog and automobile emissions creating an unhealthy environment.
One way to reduce the harmful emissions is the reformulation of gasoline by the addition of oxygenates. Two possible candidates emerge—ethanol and methyl tertiary-butyl ether (MTBE). Ethanol requires new production facilities and distribution methods that will take a long time to bring online; MTBE can be produced as a side-stream product of the gasoline production. The Clean Air Act Amendments of 1990 require the use of oxygen-enriched fuels in areas, such as Denver, CO, that have high levels of carbon monoxide. And so, the use of MTBE is expanded. Then, in Santa Monica, CA, MTBE is found in drinking water wells; levels much higher than previously measured. This leads to new wells being drilled and storage tanks being abandoned because MTBE has contaminated the tanks, and it is difficult to remove. In 1997, EPA issued a drinking water advisory that defined the limits of MTBE in drinking water to concentrations below 40 parts per billion. Air quality improved in the areas where it had been unsatisfactory, but at the cost of drinking water quality in many municipalities and expensive new equipment, and soon, aquifers in outlying areas became contaminated.

And finally, you are on a vacation, flying from Okinawa, Japan, to Tokyo, Japan. It is a smooth flight, something you have become accustomed to since it is an All Nippon Airways Boeing 737-700, one of the world’s safest airplanes. The date is September 6, 2011. Suddenly, the plane lurches and rolls violently 132° to the left and noses down at a 35° downward angle, descending 6,000 ft. The plane returns to level flight and continues to the Tokyo airport without further incident.

An investigation finds that the captain had taken a toilet break and was returning to the cockpit. This required the first officer to unlock the door (a requirement following the hijacking of U.S. aircraft on 9/11/01). The door lock switch is located just 4 in. away from the rudder trim switch. To operate the switch, it requires a counter-clockwise turn, coincidentally the same motion as unlocking the cabin door. Instead of unlocking the door, the first officer operated the rudder trim switch, pitching the plane into a violent roll and descent.

An overlooked human factors consideration, the placement of the door lock switch, could have created a catastrophic accident taking the lives of an airliner crew and more than 100 passengers. Having a design flaw, similar-motion switches in close proximity may have been overlooked during the human-factors analysis of the controls.

**How the System Safety Engineer Enhances Safety**

Early system safety was first practiced when the first person to create a wheel found that two wheels with an axle between them could be used to transport heavy loads over long distances if pulled by an animal with brute force capability. The SSE noticed that the axle needed to be restrained to keep it from sliding outboard or inboard, thereby preventing the toppling of the load. An astute SSE also noted that the load needed to be secured to the axle to keep it attached to...
the wheels. Another improvement has the tongue attached to the carriage, permitting easy control of the load and beast of burden.

System safety has developed since those early days. Now, the SSE may be involved in aerospace design, warfare design, environmental design and social design. The previous examples provide proof of this fact.

However, as we have seen in the examples, and probably experienced in our own work life, sometimes the fix creates new, unintended consequences that then require further analysis and corrective action. So to limit the number of these consequences, we, as SSEs, must expand our concern regarding the effects of our suggested actions.

The OSHA Cowboy
This now-famous illustration points to the many times that overregulation creates new problems for the user. The early days of OSHA were focused on the acceptance and application of general consensus standards; standards that, for the most part, were created for special industries or noncommercial activities but were now regulatory requirements for many new applications.

The Passenger Airbag Regulation for Vehicles
Seatbelts became required equipment in all new passenger vehicles beginning in 1968. The regulation was based on tests that showed serious injury and death could be prevented by the use of restraint systems. The law required seatbelts to be installed for all occupants. Seatbelt use was left to the occupant until state laws began requiring it. New York became the first state to enact a seatbelt use law in 1984. After years of philosophical, judicial, social and political wrangling, the U.S. government passed federal regulations that required all cars built after 1996 to have airbags. Although automotive safety experts and design engineers disagreed on the effectiveness of airbags, case studies of vehicle accidents that deployed driver’s airbags (the only airbags available in early years of deployment) indicated that lives could be saved. And so, passenger airbags were added as an additional safety improvement.

Airbags, or so it seemed, had become one of the leading contributors to the reduction in auto fatalities. Still, problems were looming:

Case 1. In October 1995 in Utah, a 5-year-old child sitting in the front passenger seat of a 1994-model automobile was killed when the passenger-side airbag deployed during a collision. Preliminary information indicates the child was not restrained by the lap/shoulder belt. The child sustained a skull fracture as a result of the airbag deploying.
result of head contact with the airbag and subsequent head contact with the roof of the vehicle.

**Case 2.** In July 1995 in Pennsylvania, a 20-day-old infant seated in a rear-facing convertible child safety seat in the front passenger seat of a 1995-model automobile was killed when the passenger-side airbag deployed. The infant sustained multiple skull fractures and crushing injuries to the brain as a result of the impact of the airbag compartment cover flap with the back of the child safety seat at the location of the child’s head. At the time of collision, the vehicle was traveling at approximately 23 miles per hour. The vehicle had a label on the right front sun visor warning against using a rear-facing child safety seat in the front passenger seat. The child safety seat also had a warning label that read “When used in a rear-facing mode, do not place in the front seat of a vehicle that has a passenger airbag.”

**Case 3.** In April 1993 in Ohio, a 6-year-old child who was sitting unrestrained in the front passenger seat of a 1993-model automobile was killed when the passenger-side airbag deployed during a collision with a stopped vehicle. The child died from a brain injury caused by blunt-force trauma.

As a result of an investigation of airbag-related fatalities and serious injuries to child passengers, the National Transportation Safety Board (NTSB) released safety recommendations regarding children and airbags. NTSB recommends collaboration between automobile and safety-seat manufacturers, the news media, health and medical organizations and the National Highway Traffic Safety Administration (NHTSA) to inform motorists and parents of the correct procedures for transporting children in vehicles equipped with airbags. NHTSA has enacted several regulatory measures addressing the airbag/child passenger problem, including labeling requirements for vehicles and child safety seats and specifications for airbag cutoff switches.

**Automatic vs. Manually Operated Fire Protection Systems**

The use of probabilities in the determination of the safety of a system has grown and is now a prominent method of evaluating the operability of complex systems.

The early design of the space station provided a central CO2 fire suppression capability. System safety required a single fault-tolerant system, thus, a single valve would be unacceptable. The solution could be two valves in parallel, thus if one failed to operate, the second might be expected to operate and extinguish a fire. However, this system has a flaw; if one of the valves leaks, the second valve can do nothing to stop the flow; the results are an empty fire extinguisher system and possible asphyxiation. The new solution is to install a parallel-series set of valves. In the event of one valve not operating, the parallel leg could be

---

**Figure 6 Passenger Airbag Switch**

**Figure 7 Early Design for ISS CO2**

**Figure 8 “Improved” ISS CO2 Fire Suppression System**
activated; if one leg leaks, the series valve (if it is downstream) can cut off the flow of CO2 and the system is safe.

However, this system also presents a new dilemma. Up-mass is important to launch programs since each pound of material costs thousands of dollars to lift to orbit. And the reliability drops from 0.9975 for the parallel system to 0.9905 for the series/parallel system. The solution? Use portable fire extinguishers. At least that was the reliability engineers’ conclusion.

But what happens if the crew is asleep, and a fire breaks out in the experiment racks? No one is there to extinguish the fire, and the automatic system has been disabled. The installed system was ultimately rejected in favor of a portable fire extinguisher discharge through a port in the rack face; a system with one inline valve and a reliability of 0.95, lower than either of the more complex systems.

How the System Safety Engineer Can Avoid Unintended Consequences

Research Similar Issues
Very few of the designs we are asked to analyze have no history in operation or construction. We, as engineers, learn from previous designs and apply the “knowledge of the known” to the “new” and look for the “unknown unknowns.” How good we become is relative to our ability to look at the “whole,” not only in design, but also in functionality and use. Common databases of lessons learned are available but are underutilized in the investigation of the new designs. Since the laws of physics are rarely found to be flawed, and chemistry is a generally well-known constant, base your conclusions on these nonvariable factors.

Identify & Talk to Stakeholders
Usually, the person (or group/client/agency) who has asked for the system has projected the level of safety with which they expect the system to perform. Asking the “buyer” how they expect the system to perform and the response to adverse conditions have usually been thought out. The safety analyst then identifies what can go wrong, how it can be detected and how it can be mitigated. Often, however, as shown in the leading examples, we fail to “think outside the box” and look to the controls that are recommended to identify issues with the “fix.”

Simulate the Revision
Placing the new system in use without conducting simulations should be regarded as malfeasance in the system’s design and delivery. How the system reacts in the environment of use is desirable for several reasons. The lessons of the passenger airbag illustrate how new hazards can creep into designs if they are not simulated (versus testing with real infants).

Test New Designs
When physical testing can be performed, it validates designs in the environment of use and provides proof of functionality. However, it should also be tested in environments that it could be exposed to; test the system using the controls that have been prescribed; evaluate the design in environments that could be detrimental; and test it for environments that are “outside of the box.”

Conclusions
When performing system safety analyses, the SSE must look beyond the anticipated use and must evaluate the potential uses and pitfalls of the design in nontraditional use, including the controls that have been developed. Limiting the evaluation of hardware design to the intended use may overlook some less-than-obvious responses to the hardware use.
Safe Winter Driving

Winter driving can be hazardous and scary, especially in northern regions that get much snow and ice. Additional preparations can help make a trip safer or can help motorists deal with an emergency. Following are tips to help prevent motor vehicle injuries due to winter storms.

The Three Ps of Safe Winter Driving:

1. **Prepare** for the trip.
2. **Protect** yourself.
3. **Prevent** crashes on the road.

**Prepare**

**Maintain Your Car:** Check battery, tire tread and windshield wipers, keep your windows clear, put no-freeze fluid in the washer reservoir and check your antifreeze.

**Have On Hand:** Flashlight, jumper cables, abrasive material (sand, kitty litter, floor mats), shovel, snow brush and ice scraper, warning devices (like flares) and blankets. For long trips, add food and water, medication and a cell phone.

**Stopped or Stalled?** Stay with your car, do not overexert, put bright markers on antenna or windows and shine the dome light, and, if you run your car, clear the exhaust pipe and run it just enough to stay warm.

**Plan Your Route:** Allow plenty of time (check the weather and leave early if necessary), be familiar with the maps/directions and let others know your route and arrival time.

**Practice Cold Weather Driving**

- During daylight, rehearse maneuver slowly on the ice or snow in an empty lot
- Steer into a skid
- Know what your brakes will do: stomp on antilock brakes, pump nonantilock

References


Clifford C. Watson, CSP, is employed at NASA Marshall Space Flight Center (MSFC) in Huntsville, AL. Watson has more than 37 years’ health and safety experience. He is currently the system safety discipline representative to the Safety and Mission Assurance (S&MA) Assessment Team responsible for technical reviews of integrated hazard reports for NASA’s Space Launch System. Clifford has been recognized as a system safety expert by MSFC S&MA. He holds a B.S. in Safety Management from Indiana University of Pennsylvania. He can be contacted at clifford.c.watson@nasa.gov.

Reprinted with author’s permission.
brakes
- Stopping distances are longer on water-covered ice and ice
- Do not idle for a long time with the windows up or in an enclosed space

Protect Yourself
- Buckle up and use child safety seats properly
- Never place a rear-facing infant seat in front of an airbag
- Children 12 and under are much safer in the back seat

Prevent Crashes
- Drugs and alcohol never mix with driving
- Slow down and increase distances between cars
- Keep your eyes open for pedestrians walking in the road
- Avoid fatigue. Get plenty of rest before the trip, stop at least every 3 hours, and rotate drivers if possible
- If you are planning to drink, designate a sober driver

For more information, visit www.osha.gov.

Joint Safety & Occupational Health Conference

Hosted by the Naval Safety & Environmental Training Center, this conference will provide Army, Army Corps of Engineers, Air Force, Navy, Marine Corps and Coast Guard personnel continuing education units necessary to maintain professional certifications and meet training requirements.

This year’s theme is “Quest for Zero”—establish a culture of risk identification and management to achieve zero preventable fatalities and mishaps.

Conference Deliverables
- The most current and up-to-date safety information from SECDEF, SECNAV and service leaders
- Attain skills, tools and strategies to inculcate safety within your command
- Network with other safety and industrial hygiene professionals
- Participate in professional accrediting courses, workshops, demonstrations and service breakout meetings
- Obtain continuing education units to maintain certifications

As with past conferences, all services, including the Navy Echelon 2 commands, will host breakout sessions for their activities. There will also be a general session featuring opening remarks, a keynote followed by concurrent sessions and training seminars. This year will feature approximately 60 seminars covering a broad range of safety topics.

The conference is planned to take place in March online. Click here for more information.