

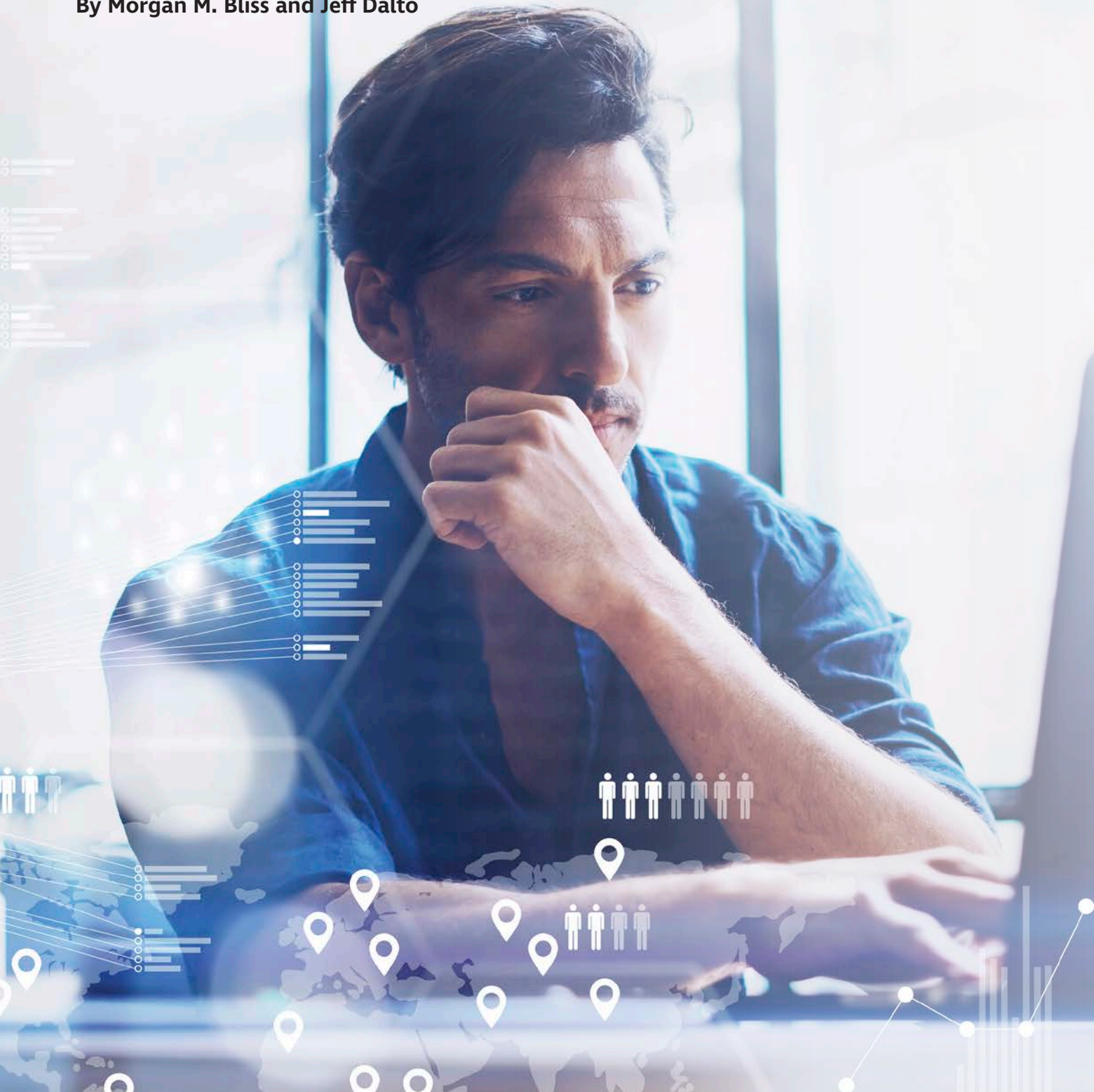
PROFESSIONAL ISSUES

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TECHNICAL COMM

Key Elements for the Safet

By Morgan M. Bliss and Jeff Dalto



COMMUNICATION

OSHA Practitioner

WRITTEN COMMUNICATION IS A FUNDAMENTAL SKILL required of all OSH practitioners. As described in “The Occupational Health and Safety Professional Capability Framework,” an OSH practitioner must prepare professional reports or documentation for a variety of audiences (INSHPO, 2017). These documents should be written and effectively communicated using applicable standards.

The form of written communication most frequently used in OSH is technical or scientific writing. Society for Technical Communication (STC, 2019) defines technical communication as any method of communication that has at least one of the following characteristics: 1) covers a specialized or technical topic; 2) uses technology such as websites or social media; or 3) gives instructions to accomplish a task. In short, the purpose of technical or scientific writing is to communicate information to an audience.

When performing technical writing for OSH communication, an OSH practitioner should consider or include several key elements. Proper consideration and inclusion of these elements will make the technical communication more effective; however, failing to consider or include these elements will decrease the chances that the document will satisfy its intended purpose. Detailed in the following sections, these key elements include project preparation and purpose, structure, audience, graphics and visuals, use of technology, review process and communication of knowledge.

Project Preparation & Purpose

The first four items needed to prepare to write a technical document are identifying: 1) the client that requested the document; 2) the type of document requested; 3) the goal and scope of the document; and 4) the turnaround time for the document.

The client is the person, organizational unit or entity that requested the document. The client is not necessarily the same as the audience. Correctly identifying the client will help an OSH practitioner avoid confusing the client with the audience or writing a document under the assumption that the client is the audience. Making this mistake may cause an OSH practitioner to use language, tone or jargon that is not intended for the true audience. It may also cause an OSH practitioner to write a document based on a mistaken understanding of the audience’s prior knowledge. This may lead to additional mistakes, such as providing sensitive or private information to an audience that should not receive it.

KEY TAKEAWAYS

- OSH practitioners frequently use technical communication to convey information to a wide range of audiences.
- Documents and reports should be written and effectively communicated using applicable standards.
- This article details seven key elements that will make technical writing for OSH communication more effective: project preparation and purpose, structure, audience, graphics and visuals, use of technology, review process, and communication of knowledge.

The next consideration is the type of document the client expects. Throughout this article, the term *document* is used, but this can refer to a proposal, procedure, report, training module or any other form of communication. The goal or scope refers to the size, depth and complexity the client expects; this can range from a one-page procedure, a multipage report, a web-based training module or an entire contractor safety handbook. It is important to verify the client’s expected turnaround time or due date, and whether there are additional delivery deadlines and milestones before the document is completed, such as submitting a draft for review.

Rosenberg (2005) recommends the use of document specifications for any document greater than 25 pages in length. Document specifications should be developed collaboratively and include an overview of the project, description of what a reader should know after reviewing the document, length, an anticipated outline, a list of document reviewers and a schedule for completing the document.

Correctly identifying the client will help an OSH practitioner discuss and agree upon the appropriate document type, scope and goals, and turnaround time, all of which will increase the chances that an OSH practitioner will produce exactly what the client is expecting.

Structure

The structure of a document depends on its type. An OSH practitioner may write many types of documents during his/her career, and each will have its own expected structure. Table 1 (p. 32) describes several of the most common types of documents and provides examples of each based on the following scenario: An old flammable liquid storage cabinet is discovered with unlabeled chemicals.

Correctly structuring a document begins by selecting the appropriate document type. Paying attention to the guidelines outlined in Table 1 (p. 32) and selecting the appropriate document type for each communication need will help an OSH practitioner provide information in the best possible format. Failing to do this may lead to confusion and may frustrate the audience, both of which will reduce the document’s effectiveness.

Many document types written by OSH practitioners can be lengthy and complex. For this reason, it is important to consider how the reader will navigate the document. When developing a document template without using established formatting standards, it can be difficult to know which sections should have a heading or subheading. The practice of mind-mapping or concept-mapping may be useful to identify common themes in a document. Alley (2019) has compiled writing guidelines for engineering and science professionals, including e-mail, technical reports and laboratory reports, and provides free downloadable templates.

Depending on the document, a table of contents, glossary, appendices and index may be required to help the reader more easily find information within the document. The ANSI/National Information Standards Organization (NISO) Z39.18-2005 standard

TABLE 1

TYPES OF WRITTEN COMMUNICATION USED BY OSH PRACTITIONERS

Listed here are several of the most common types of documents and examples of each based on the following scenario: An old flammable liquid storage cabinet is discovered with unlabeled chemicals.

Document type	Description
Activity report	A status or progress report, update or log of completed activities, usually sent informally, that contains the project information, tasks, challenges and solutions. Example: During an audit, an old flammable liquid storage cabinet is discovered to have unlabeled chemicals inside.
Proposal	A response to a requested scope of work that explains the project scope, methods to be used, anticipated budget and qualifications of the person or company. Example: A bid from a consultant to assess the unlabeled chemicals for waste classification.
Technical/analytical report	A report that describes the findings of a project. It usually includes an abstract or executive summary, introduction, methodology, results, discussion, recommendations and conclusion. It may include tables and graphs. Example: A report from the consultant identifying the hazardous chemical characteristics of the unlabeled chemicals.
Case study	A detailed analysis of one incident or situation that highlights a problem and shows how it was solved. It usually includes an introduction, literature review, methodology, discussion and conclusion. Example: A review of a similar incident in which unlabeled chemicals were found and properly classified.
Specifications	A detailed description of a project or process that explains the requirements for completion of the project. Example: Drawings and instructions for a custom-built flammable liquid storage cabinet to replace the old one.
Guide or handbook	An instructional or informational document. Example: The U.S. EPA's Hazardous Waste Generator Regulations reference document.
Standard/safe operating procedure	A document that provides step-by-step instructions for completing a task. Example: The procedure for conducting waste determination for unlabeled chemicals.
Program	A combination of policies, procedures, guidelines and other documents. Example: Hazardous chemical management may involve the hazard communication program, chemical hygiene plan, environmental management guidelines and related plans.
Manual	A document that contains the requirements for operating a system. Example: The documents comprising the safety and health management system should include a section on hazardous chemical management.
Training supplemental material	Documentation provided to supplement training, such as handouts, guides, how-to instructions, guided notes and hands-on exercises. Example: An employee guide to hazardous chemical identification developed as part of a training module.

for scientific and technical reports provides an explanation of the front matter, body matter and back matter components, summarized in Table 2. OSH practitioners should review this consensus standard for definitions and descriptions of each section.

Following these guidelines to properly structure technical writing will make it easier for the audience to skim, navigate, read, understand and remember information in the document. It will also help the audience return to the document and refer to specific sections. Failing to structure the document in an organized way may lead to a decrease in the audience's engagement and faith in the document.

Purdue University's (2019) online writing lab has a checklist for engineering reports that notes two important issues with document structure: 1) headings must be organized in a clear hierarchy; and 2) the document should move from general to specific information.

Audience

Once the purpose and structure of the document have been determined, it is necessary to examine the audience. Who will be reading this document as the end user? Is the document for the public, all employees of an entity, supervisors, executives or safety peers? Knowing the type of audience will change how

information is conveyed. What is the client's goal for the audience after reviewing the document? What are the audience's expectations for the document?

When conducting an analysis of the proposed audience of a document, one should consider the general education level, experience with the topic and whether English is their first language. Sinyai, MacArthur and Roccotagliata (2018) identified that many OSH documents used for training and educating workers are written beyond the sixth to eighth grade reading level recommended by health communication researchers.

OSH practitioners should acknowledge and recognize how the document might be used in the future. An informal activity report for a project may have been written in an e-mail and distributed to a team of colleagues as part of normal workplace communication. However, the same informal activity report could be used in legal proceedings. This is true of formal technical reports, manuals, handbooks and various other technical communication types. Try to understand the potential legal implications of a document before releasing it to the client and its intended audience.

Properly identifying the audience helps an OSH practitioner select the correct language and tone for the document. With an improved understanding of the audience's preexisting

TABLE 2

COMPONENTS OF A TECHNICAL OR SCIENTIFIC DOCUMENT

Document component	Sections included
Front matter	Cover page, title, report documentation, abstract, contents, list of tables and figures, acknowledgments
Body matter	Executive summary, introduction, methods, procedures, results, discussion, conclusions, recommendations, references
Back matter	Attachments, appendices, list of abbreviations/acronyms, glossary, index

Note. Adapted from *Scientific and Technical Reports—Preparation, Presentation and Preservation [ANSI/NISO Z39.18-2005 (R2010)]*, by ANSI/National Information Standards Organization (NISO), 2010.

knowledge and cultural expectations and norms, the safety practitioner will have a better sense of what must be explained and at what level. This makes it easier to communicate reliably, persuasively and authoritatively. Failing to properly identify the audience can lead to use of inappropriate or confusing jargon, thus reducing the document's effectiveness.

Graphics & Visuals

In discussing technical writing, it is easy to focus exclusively on written words and neglect forms of visual communication such as photos, diagrams, tables and graphs. However, these forms of visual communication have great explanatory power. When including photos, tables and other images in your document, make sure the visuals are relevant and directly relate to a specific point. Visuals used in a document should include a caption that explains what the image is, further explains its relevance or provides additional information to the audience to help them make sense of the image and its meaning within the context of the document.

Many types of images can be used in documents. Photos are an effective way to show physical objects in the real world such as work areas, machines, equipment, tools and hazards. With modern photo-editing software applications, elements such as pointers, circles and highlights can be added to the photo to draw the audience's attention to specific items in the photo.

Photograph logs and videos are often used in activity, inspection and analytical reports. According to U.S. EPA's (2017) guidance document for taking, logging and preserving digital images and videos, the intent of digital images and videos is to portray a "fair and accurate representation" of an observation. As a best practice, a photograph log should include the following information: 1) identity of the photographer or videographer; 2) date and time; 3) location (name, address, specific location such as building or room number); 4) relevant details or description of the digital image or video; and 5) identifying number of the digital image or video. If the digital image or video was modified, this should also be noted in the photograph log.

Tables are an efficient way to display data in a manner that makes it easier to see the big picture. Be sure to provide proper headers for table rows and columns. Graphs help to communicate relationships within data or between data sets. Graphs can be easily created in software applications and, when created properly, they make it easier for the reader to view and understand the story within the data, such as a trend or a relationship between the data sets. Different graph types include line graphs, bar graphs, scatter diagrams, histograms and box plots. Each is suited to specific purposes.

Including visual elements such as tables, charts, graphs and photos in technical communication can help make the document more engaging, information-rich and persuasive or explanatory, all of which are primary goals of technical com-

munication. Failing to use these important tools in a document will reduce audience engagement, comprehension and retention, as well as transfer and application of the information.

Use of Technology

When creating an OSH document, think about how the document, parts of the document or information within the document can be shared or repackaged to share on social media. Multiple documents in different formats may be developed to communicate the same information on different social media platforms. For example, a photo for Instagram, a video for Facebook, a PowerPoint slide deck for SlideShare and a PDF file for a company's internal SharePoint server.

Consider which devices the audience will use to view documents and training. Much of the audience will be using mobile devices such as tablets or smartphones to view the document. Since these devices have smaller screens than a desktop computer, this restriction may impact the way a document is designed.

Another concern involves making it easier or more difficult to share the information in an OSH document. In some cases, the document is intended to be public and posted on social media sites. One way to increase visibility of a document is to research and use hashtags that people already use to tag documents with similar content. People who are searching social media sites with those hashtags are likely to find the document if similar hashtags are used. An OSH practitioner can also use search engine optimization techniques. By using keyword planning tools such as Google's Keyword Planner, search volume and competition for specific search strings can be used to identify specific phrases in documents, especially in the title and section headers.

Documents must also comply with the revised Americans with Disabilities Act (ADA) and Section 508 rules. Universal design concerns apply to written documents, PDF files, presentations, websites, spreadsheets, video or audio, or other social media items. The accessibility requirements are too numerous to detail in this introductory article but are presented well at the U.S. General Services Administration (2019) Section 508 website, which includes checklists and explanations about universal design. Three important document formatting accessibility tips are: 1) save the document with a descriptive file name; 2) ensure that the document can be navigated by only using the keyboard with the up/down and right/left arrow keys; and 3) always add descriptive text to pictures, tables, shapes and other images (GSA, 2019).

OSH practitioners who are less familiar with the expanding role of social media in business may find the idea of sharing technical information via crowdsourced pathways such as Instagram, Twitter, Reddit, YouTube and other social platforms to be confusing. Hashtags such as #Safety, #SafetyTraining and #SafetyLearning are already in regular use on these platforms. These hashtags make it possible to search for all content shared by users (e.g., recent published best practices, case studies, news, journal articles) on the various platforms. As an example, if an organization completed a complex or interesting hazardous chemical identification activity with potentially wide-ranging impacts and wanted to share its best practices with similar organizations, the company could consider publishing the case study on social media and tagging it with relevant hashtags such as #Sustainability, #IndustrialHygiene, #HazardousChemical, #HazCom, #BestPractice or #ChemicalDisposal.

The OSH practitioner can reach the widest possible audience by considering in advance the different technological methods of publication for a document. This will also help the document

to reach the audience in the manner that is most appropriate for the media platform where they choose to consume information and content. Such advance planning also helps avoid inadvertent release of private or sensitive information. Importantly, it allows the document to be delivered in a manner that is accessible to all. Not considering these issues when the document is created may reduce the exposure of the document, reduce the effectiveness of the document, could lead to legal problems and may unfairly exclude certain members of the audience.

Review Process

The review process for OSH documents can be simple, such as having a colleague review an e-mail before sending it out, or complex, with multiple layers of reviewers before a document is finalized. A reviewer can be a colleague or peer, a supervisor or manager, a technical communications specialist or a subject matter expert (SME). There are also many ways to conduct the review process, which may vary greatly depending on the industry and corporate structure involved. If the document content is new or if those writing the report are not SMEs in the subject matter of the OSH document, technical experts should be consulted to ensure information saliency and relevancy.

In its manual about industrial hygiene and safety auditing, American Industrial Hygiene Association recommends that a draft of an OSH document should first be circulated among the team responsible for creating the document (Hollenbeck, 2007). Once the team's input and corrections have been incorporated, the document can be sent for senior or peer review before it is sent to the client. A schedule for the review should be established so that the document can be finalized in a timely fashion.

Generally, during the process of senior review, the author or creator provides a draft document to a senior or peer reviewer. This draft document may be developed using a report or document template for consistency and layout. When using a report or document template, review the document before it is finalized and delete irrelevant or unnecessary information. The senior reviewer should read the document and make recommended edits for grammar, referenced standards, assumptions, technical approach, data analysis, consistency, findings, recommendations and conclusions. The author or creator then incorporates the recommended edits and may send the final draft to the senior reviewer for quality assurance and control before the document is finalized.

Performing a careful review process will help the OSH professional identify and fix or remove errors that will decrease the document's effectiveness. Failing to do so may create negative impressions about the safety professional or the technical topic in the future.

Communication of Knowledge

The entire purpose of technical writing in OSH is to communicate knowledge to an audience. Two important aspects of technical writing are 1) to ensure that the information within a document is accurate and credible; and 2) to present the information in a way that makes it easy for readers to understand. It can be challenging to identify the most crucial information to provide in a technical or scientific document.

Part of communicating knowledge is preservation of that knowledge, either through a physical copy or a digital copy. According to the ANSI/NISO Z39.18-2005 standard, links used in a document should be persistent so that the document is not lost when files are reorganized or moved. Links should be verified before publication of the document. Digital documents should be developed to be shared across all types of platforms and applications, as well as between organizations (ANSI/NISO, 2010).

Properly preserving a document and following industry standard protocols for linking will make it easier for the audience to access and fully appreciate the document. This also helps improve the effectiveness and reliability of the document.

Conclusion

Technical writing provides the ability to communicate technical, scientific and detailed information in a manner that increases the audience's understanding. Being a capable technical writer is a competency expected of OSH practitioners. Both the client and author or creator must have a shared understanding of the client's needs, purpose of the project, audience and document type. Writing clearly, including visual elements for additional explanatory power and ensuring that the document is properly reviewed are the next set of considerations. There are potential issues related to publication technologies, storage and additional uses of the document beyond its original intended use, which may include possible legal ramifications from creating the document. OSH practitioners and their audience will benefit from becoming familiar with the expectations of technical writing and practicing the craft. **PSJ**

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Morgan M. Bliss, CSP, CIH, is an assistant professor in the safety and health management program at Central Washington University. She has more than 12 years' experience as an industrial hygiene, occupational safety, environmental management and emergency management consultant. Bliss is a professional member of ASSP's Puget Sound Chapter and serves as Administrator for the Society's Training and Communications Practice Specialty and Professional Development Chair for the Industrial Hygiene Practice Specialty.

Jeff Dalto is a senior learning and development specialist for Convergence Training/RedVector, a Vector Solutions brand. Dalto is an OSHA-authorized 10- and 30-hour general industry trainer; holds a General Industry Safety Specialist certificate from University of Washington; and is a member of the subcommittee creating the ANSI/ASSP Z490.2 standard for online EHS training. He is a member of ASSP's Columbia-Willamette Chapter, and a member of the Society's Training and Communications Practice Specialty.