ABSTRACT

A TECHNICAL COMMUNICATION INTERNSHIP AT
THE NATIONAL INSTITUTE FOR OCCUPATIONAL
SAFETY AND HEALTH (NIOSH)

by André Ramon Allen

This report describes my internship as a technical writer/editor at the National Institute for Occupational Safety and Health (NIOSH) in Cincinnati, Ohio. NIOSH is the primary federal agency responsible for researching and making recommendations for workplace safety and health. As a technical writer, I wrote and designed a brochure about skin exposures to hazardous chemicals in the workplace. As a technical editor, I contributed final edits to the NIOSH Chartbook and completed several other editing projects for scientists in the Document Development Branch.

In this report, I discuss how I performed my writing and editing tasks in accordance with the NIOSH document development process. I also describe the challenges I encountered as I analyzed and wrote for audiences with whom I had no direct contact. Finally, I reflect on how my internship experience at NIOSH affected my development as a technical and environmental communicator.
A Technical Communication Internship at
The National Institute for Occupational
Safety and Health (NIOSH)

An Internship Report

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Department of English
by
André Ramon Allen
Miami University
Oxford, OH
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Advisor: __________________________
Dr. Paul Anderson

Reader: __________________________
Dr. W. Michele Simmons

Reader: __________________________
Dr. Adolph Greenberg
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Chapter 1: An Introduction to NIOSH

To fulfill one of the requirements for the degree of Master of Technical and Scientific Communication, I interned as a technical writer/editor at the National Institute for Occupational Safety and Health (NIOSH) in Cincinnati, Ohio. At NIOSH, I worked in the Document Development Branch (DDB). This branch synthesizes scientific data to develop NIOSH policy and to create and evaluate communication products to reduce worker disease and injury. My most important project consisted of writing and designing a brochure about dermal exposures in the workplace. However, I also started another large editing project and helped DDB scientists and editors with other projects as needed. The internship lasted 16 weeks, from February 2 to May 21, 2004. The rest of this chapter describes NIOSH and how my work complemented its organizational goals.

Sponsoring Organization

NIOSH is the federal agency that conducts research and makes recommendations for the prevention of work-related injury and illness. NIOSH and the Occupational Safety and Health Administration (OSHA) were created by the Occupational Safety and Health Act of 1970.

Although NIOSH is often confused with OSHA, they are separate agencies with different functions. NIOSH is a Centers for Disease Control and Prevention (CDC) research agency in the U.S. Department of Health and Human Services, whereas OSHA is a regulatory agency in the U.S. Department of Labor.

Headquartered in Washington, D.C., NIOSH has research laboratories and offices in seven cities throughout the United States, though its two largest centers are both in Cincinnati. The organization represents a wide range of disciplines including epidemiology, medicine, industrial hygiene, toxicology, safety, psychology, engineering, chemistry, and statistics.

The following are the strategic goals of NIOSH:

- To conduct research to reduce work-related illnesses and injuries
- To promote safe and healthful workplaces through interventions, recommendations and capacity building
- To enhance global workplace safety and health through international collaborations

NIOSH employees often collaborate with partners in the occupational safety and health community, industry, labor, and the general public to continue improving workplace safety and health. Most DDB employees work with employees in other branches and divisions of NIOSH, as well as related organizations such as the Environmental Protection Agency (EPA) and OSHA to accomplish organizational goals.

Like other federal agencies, the culture at NIOSH is a bureaucracy. The most prominent examples of this bureaucratic culture were the strict processes that DDB employees followed to publish documents and change policies. In addition, the turn-around time for decisions, approval, and feedback on projects was slow.
Education and Information Division (EID)
As an intern, I worked primarily with the DDB Editorial Team in the Education and Information Division (EID). The functions of EID are to develop and transfer information and provide recommendations to prevent occupational injuries and diseases. EID employees execute these functions through targeted information dissemination, training, and the development of risk assessments.

There are four branches within EID: DDB, the Information Resources Branch (IRB), the Risk Evaluation Branch (REB), and the Training and Educational Systems Branch (TESB). Figure 1 shows my place in EID as a member of the Editorial Team.

Document Development Branch (DDB)
The goal of DDB is to produce quality communication products to reduce worker disease and injury. Specifically, DDB focuses on the following objectives:

- Providing occupational safety and health recommendations and strategies to prevent work-related injury and disease worldwide

- Formulating these recommendations and strategies by evaluating scientific data and disseminating this information via the NIOSH Web site; policy, technical, and educational documents; and other communication products

- Evaluating interventions and other safety and health communications by collaborating with partners in the occupational safety and health community, industry, labor, and the public to continue improving workplace safety and health

The functions of the DDB Editorial Team are to edit, write, and publish technical and educational documents and other communication products.
Figure 1. NIOSH Education and Information Division (EID) Organizational Chart.
Role as a Writer/Editor
To express my interest in an internship, I sent the deputy director of EID a cover letter, resume, and a set of instructions I created for *Introduction to Technical and Scientific Communication*.. On the basis of these materials, the reputation of the Master of Technical and Scientific Communication (MTSC) program, and an informal interview, the human resources department hired me as an intern.

I fit into the DDB structure as a writer/editor with an academic background in technical communication and environmental science. The deputy director of EID, my internship supervisor, and my writing mentor already knew how I could contribute to DDB because several MTSCs had performed their internships at NIOSH and were still employees or fellows.

For my major project, I was asked to create information materials to communicate new information regarding the proposed change in the NIOSH skin notation policy. Skin notations are key notes that appear in the *Exposure Limits* column of *The Pocket Guide to Chemical Hazards* (*The Pocket Guide*).

Creating the skin notations brochure and proofreading the NIOSH *Chartbook*, the main projects for which I was hired, were both important to NIOSH goals in different ways. My work on the skin notations brochure was vital to NIOSH goals because it was intended to help protect workers against hazardous chemical exposures in the workplace. NIOSH was in the process of updating its skin notation policy, so it was necessary for workers and industrial hygienists to understand the changes and why they were being made.

My work on a minor project, editing the *Chartbook*, contributed to NIOSH goals by providing information to researchers and the occupational safety and health community. It also helped the Editorial Team meet its primary goal of assuring document quality and excellence in writing. Likewise, my work on other editing projects for DDB employees helped them to achieve excellence in their communications.

Interaction with Internship Supervisor and Writing Mentor
My internship supervisor, Heinz Ahlers, was the acting branch chief of DDB. He and my writing mentor, Anne Hamilton, were instrumental in organizing the logistics of the internship and arranging for me to work on the skin notations brochure. I spoke with Heinz regularly, but I primarily worked with the subject matter expert (SME), Chen-Peng Chen, and my writing mentor to create the brochure.

Anne Hamilton was the senior technical writer/editor of the Editorial Team. She had 40 years of experience as a technical writer/editor, having worked for NIOSH and other federal agencies for a total of 23 years and consulted for 17 years before coming to NIOSH. Anne’s office was next to my work area, and we communicated regularly about NIOSH affairs and my projects.

In the following chapters, I describe my internship projects (Chapter 2), give a detailed account of my work on the skin notations brochure (Chapter 3), and (1) compare the NIOSH model to the MTSC problem-solving model and (2) reflect on what I learned from my experience at NIOSH (Chapter 4).
Chapter 2: Internship Projects

This chapter describes my major and minor internship projects. These projects included the following:

**Major Projects**
- Creating the skin notations brochure
- Editing an occupational safety and health program and system effectiveness report

**Minor Projects**
- Creating a large poster to present scientific information from a white paper
- Contributing final edits to the NIOSH Chartbook
- Editing and animating a PowerPoint slideshow

In addition to the aforementioned projects, I engaged in other miscellaneous activities such as creating flyers, proofreading materials as assigned, attending branch meetings, and reviewing software tutorials. Figure 2 shows how much of my total internship time I spent on each of these projects.

I used parts of the MTSC problem-solving model\(^1\) to perform all of these activities except proofreading the Chartbook and editing the PowerPoint slideshow. The problem-solving model includes the following activities:

- Defining the problem
- Designing the solution
- Testing the solution
- Implementing the solution
- Evaluating the solution

The first two activities, defining the problem and designing the solution, were most applicable to my projects. I did not have enough time to complete either of my major projects during the 16 weeks of the internship. Therefore, I did not test, implement, or evaluate those communications. I did, however, complete all of my minor projects.

**Editing the Program and System Effectiveness Report**

Editing the *Program and System Effectiveness* report was a major project that I started in the middle of Week 5. The project involved simplifying 29 pages of a study report on occupational safety and health (OSH) program and system effectiveness. The study report was written for scientists in complex language, and an occupational chemist in DDB asked me if I could turn it into a document that union stewards, health and safety professionals, industrial hygienists, and the general public could understand.

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My objective was to communicate the information from the report to the audiences using language on the 8th grade reading level. The project involved the following activities:

- Meeting with the occupational chemist to discuss the purpose of the project and his expectations
- Reading background materials on OSH programs and systems to familiarize myself with the subject matter
- Creating a document specification to verify project expectations with the occupational chemist
- Attending an exposition and listening to sessions on occupational programs and systems to further improve my understanding of the subject matter
- Editing the first 29 pages of a study report, which contained the primary information to be communicated
- Consultation with the occupational chemist to answer my questions
- Sending brief status reports to the occupational chemist (See Appendix 1 for a sample report)

I spent 32% of my total internship time on this project. In contrast to the skin notations brochure, the goals and expectations for this project were far less defined when the occupational chemist presented this project to me. The act of creating a document specification for this project, which I learned how to do in *Technical and Scientific Writing*, was highly effective in helping to define the problem and design the solution. Appendix 2 shows the document specification that I created for this project.

I made significant progress correcting sentence structure errors as well as adding overviews and headings to the report, but I did not complete the project during my internship. Overall, a considerable amount of simplifying was still required for the technical information in the report to be usable by the audiences.

**Proofreading the NIOSH Chartbook**

Proofreading the NIOSH *Chartbook* was an activity that I performed almost every week of the internship until Week 10. The *Chartbook* is an annual publication of surveillance statistics and figures on occupational injuries, illnesses, and fatalities. The *Chartbook* graphically presents this information by categories such as age, sex, ethnicity, number of years employed, and geographic location.

The *Chartbook* was in its final stages when I proofread it, so the sentence structures were usually correct. However, the document still contained occasional errors because the document development team leaders were still making editorial decisions as well as verifying and updating information and statistics that were presented in figures. For example, the most common errors that I found were words that were accidentally repeated twice in a row or words that were misplaced in a sentence. The common denominator for these mistakes was that they were usually errors that a spell checker is not capable of noting.
My proofreading tasks included the following:

- Checking sections, headings, and figures for grammatical errors
- Reading the content aloud to catch errors
- Verifying that section overviews referred to the correct figures within the chapter
- Ensuring that numbers in tables corresponded to numbers in the text

I did not use any aspects of the problem-solving model to perform this activity because such decision-making was not required on my part. I spent 11% of my internship time proofreading the Chartbook. This activity was one of the most tedious of all that I performed, but it improved my ability to carefully examine final documents.

Creating a Poster Based on a White Paper

Creating a scientific poster involved taking information from a 3-page white paper on control banding and creating a 36” x 54” poster using Microsoft PowerPoint. The author of the white paper, a DDB health scientist, was preparing to present this information to other scientists at a conference. I began this project at the beginning of Week 2 and completed it at the end of Week 4.

The white paper discussed Control Banding in Work Environments that may be Immediately Dangerous to Life and Health. Control banding is an innovative and simplified approach to protecting worker health that organizations can conduct on their own by assessing and managing occupational risks related to hazardous substances.

Although NIOSH had a poster template that specified font sizes, font types, and column format, I still had much work to do to design the poster contents. My task was to decide how to present the information concisely on a poster and to create effective graphics to illustrate major concepts. The steps I took to create the poster included the following:

- Determining what information from the white paper was imperative for the poster
- Dividing the white paper contents into major sections
- Deciding what order to present the information on the poster
- Using the NIOSH template as a framework on which to base design decisions
- Creating a flow chart to illustrate major steps in the control banding process
- Choosing appropriate colors for aesthetic and emphasis purposes, as well as to be consistent with other NIOSH posters to be presented at the conference
- Discussing my work with the health scientist to determine whether it met his expectations
- Seeking editorial review of the final draft from my writing mentor, a member of the Editorial Team, and a graphic design specialist

I spent 9% of my internship time on this project, and I completed it at the end of Week 4. Appendix 3 shows a miniature version of the final poster. The project was successful because the health scientist was impressed with the final poster and told me that it was effective at the conference.
Editing and Animating a PowerPoint Presentation

This smaller project involved editing and animating selected PowerPoint slides for an important presentation by the same health scientist for whom I created the poster. I developed this project from the end of Week 8 until the middle of Week 10.

My task was to edit the text of about 50 slides and animate certain slides for emphasis and because of time constraints. I also decided to add appropriate graphics to make the presentation more interesting. Overall, this project involved the following tasks:

- Animating specified slides
- Obtaining graphics from the Internet to make the slide show more interesting
- Deleting unnecessary information to make the slides more concise
- Working with the health scientist to assure the slides worked in synergy with his thought process

Editing and animating the presentation were simple tasks. I spent 5% of my internship time working on this project. I was glad to be able to prepare this project because the scientist used the slideshow to present information as part of the final review process for a branch leadership position.

Creating the Skin Notations Brochure

Creating the skin notations brochure was one of my two large internship projects, as well as my most important priority. In this section, I briefly describe the tasks involved in creating the brochure, but I will describe the project in depth in Chapters 3 and 4.

The purpose of creating the brochure was to inform industrial hygienists, workers, and anyone else exposed to hazardous chemicals about the proposed NIOSH policy update on skin notations. The brochure needed to explain to workers why NIOSH was changing its policy and why the new skin notations would be better. The project involved the following activities:

- Reading background materials about skin exposures and the skin notation policy
- Reviewing NIOSH brochures for content and design ideas
- Meeting with the SME to ask questions about the subject matter and seek feedback on the technical accuracy of drafts
- Creating the brochure copy using Microsoft Word
- Consulting my writing mentor for editorial review
- Creating the brochure design using Adobe InDesign 2.0.

As indicated in Figure 2, I spent 36% of my time on the brochure, but I did not complete it within the period of the internship. I drafted approximately thirty iterations as I wrote three formal drafts, and created most of the layout and design features.
Figure 2. Time Spent on Internship Projects
Summary of Internship Projects

The projects that I worked on throughout this internship varied in their applicability to my future endeavors as a technical and environmental communicator. The projects that were most beneficial to my future aspirations in environmental communication were drafting the skin notations brochure and creating the poster on control banding.

Creating the skin notations brochure required me to simplify information that explained NIOSH policy on skin exposures to hazardous chemicals. Similarly, editing and organizing the scientific information to develop the Control Banding poster was an activity that I am sure will help me to present my own work in the future.

As I worked on the various projects, the only one for which I consciously used the problem-solving model was the program and system effectiveness project. For that project, my informal document specification was fundamental to reaching a clear understanding between the occupational chemist and me about what the project involved and how the deliverable should look.

The most difficult endeavors were my larger projects, the skin notations brochure and the Program and System Effectiveness report. In both cases, I had no interaction with the audiences and limited knowledge of the subject matter. The smaller tasks of proofreading the Chartbook, creating the poster, and preparing the PowerPoint presentation were less difficult. Of these three minor activities, I learned the most while creating the poster. As I created the poster, I improved my teamwork skills as I collaborated with the scientist and also my ability to use the graphic design software.

The next chapter describes in detail my process for creating the skin notations brochure. I developed the brochure for 13 of the 16 weeks of the internship.
Chapter 3: The Skin Notations Brochure

In this chapter, I describe in detail how I created the skin notations brochure. As mentioned in Chapter 2, I created three formal drafts and designed the layout for the brochure.

Project Background

The purpose of the brochure was to communicate the proposed changes to the NIOSH skin notation policy and describe the potential impact on the workplace. Skin notations, listed in the Exposure Limits column of the NIOSH Pocket Guide to Chemical Hazards (The Pocket Guide), inform readers about the possible effects of hazardous chemicals on exposed skin. The Pocket Guide is one of the most widely disseminated and heavily used NIOSH publications. For example, The Pocket Guide is a key tool for people involved in emergency response to chemical accidents or terrorist attacks. See Appendix 4 for a sample page from the 2004 Pocket Guide that shows how the old skin notations appeared.

NIOSH decided to change its skin notations because many readers found them confusing. Readers were confused because the old skin notations in The Pocket Guide only provided readers with information about whether significant amounts of chemicals were likely to be absorbed through skin. The old skin notations did not cover all the types of effects of hazardous chemicals on skin because the scientific data upon which the new notations were based was not yet available.

The benefits of the new notations were that first, they provided much more useful information about the possible effects of hazardous chemicals on exposed skin in the workplace and second, the new notations were based on the most recent scientific information about skin exposures to hazardous chemicals.

The skin notations brochure was categorized as a numbered policy document because it was intended for widespread dissemination to the public. Documents that are not numbered are those that are created for small non-public audiences, such as scientists at NIOSH or within CDC. The skin notations brochure was intended to explain policy issues to a wider audience. NIOSH was also in the process of updating several other policies such as those dealing with protective clothing for workers and chemical exposure values.

In comparison with the ongoing development of other communication products in EID, the estimated one-year time frame to create and disseminate the skin notations brochure was relatively short. The SME and my writing mentor explained that longer documents and documents for which content was still being developed naturally took longer to create and disseminate. The timeline for completion of the skin notations brochure corresponded with the placement of the new skin notations in an upcoming edition of The Pocket Guide.

First Thoughts

When I initially learned what my tentative duties for the internship would be, I was concerned about completing the brochure too quickly and not having enough to do. The position description provided by my internship supervisor specified the following:
The intern will develop a 5–7 page information brochure on dermal exposures and applying the newly modified NIOSH skin notation with a primary audience of small businesses and workers. NIOH has recently modified the skin notation policy and information materials for workers and employers are needed to communicate the extent of the changes and the impact on workplace controls and personal protective equipment. Intern will work closely with NIOSH Dermal Exposure Research Program scientists to develop appropriate language and graphics and presentation to communicate the message to the audience. Senior editors and graphic communication specialists will be available for consultation as needed. Both a hard copy and web version will be produced. (E-mail, December 2003)

On the basis of the description, I was excited to have the opportunity to work with a scientist and write a policy-related document. However, I wondered, “How long could it possibly take to condense the scientific information and write a five-to-seven-page brochure?” This project seemed like an endeavor I could easily complete before the internship ended.

I had previously co-designed a 30-page MTSC program brochure for prospective students in Information Design and completely designed a 13-page brochure about Congressman Michael Oxley for my graduate assistantship in the Office of External Relations at the Miami University School of Business. I completed each of these brochures in approximately one month using Adobe PageMaker. Based on my success with these projects, I felt confident about my desktop publishing skills.

It seemed that understanding the subject matter might be the only potential obstacle in creating the skin notation brochure. However, I felt confident that I could overcome this obstacle by carefully reading background documents and asking the SME the right questions.

**Document Development Teams**

Every document at NIOSH is created and managed by a document development team. The document development team for the skin notations brochure included my internship supervisor, my writing mentor, the SME, and me. My internship supervisor was the project officer—the person in charge.

Prior to my arrival, the other members of the team decided that the medium for this document would be a 5 - 7 page brochure to be distributed to approximately 6,000 to 10,000 people. However, the dimensions were not set and I was given artistic license to design the brochure in any way that would effectively communicate the skin notation policy information.

**Preparing to Draft the Brochure**

To prepare for work on the brochure, I met with the SME, Dr. Chen-Peng Chen, an environmental toxicologist in DDB. Dr. Chen’s areas of expertise were environmental and occupational skin exposures to toxic substances. His work at NIOSH included developing mathematical algorithms for evaluating health risks from skin absorption of toxic substances and translating findings from scientific research into policy recommendations for exposure control.

The SME and I met for an hour on each of the first few days of the internship. I listened to him discuss the fundamentals of the subject matter and asked questions about unclear information.
The SME also provided a number of background documents that described problems associated with hazardous chemical exposures and the need for an update to the skin notation policy. Appendix 5 presents the complete outline of preliminary specifications for the brochure prepared by the document development team.

After listening to the SME and asking questions during the first few days, I still did not have a clear understanding of the subject matter or how I would write the brochure content. There seemed to be many levels to the content for the brochure and also many document reviewers with different objectives who had to be satisfied with the final product.

My writing mentor was the only other person with whom I spoke about the skin notations. Like the SME, she provided simple explanations for the purposes of the brochure and how the finished product might look in comparison to other NIOSH communication products. However, in the preliminary stages of the project, I talked almost solely to the SME because he was the person most able to help me understand the complete spectrum of the project.

For example, three of the most important dimensions of the project were the background scientific research on hazardous chemical exposures, the roles played by partner organizations, and the expectations of the various document reviewers at NIOSH and within industry.

**Reading Background Documents**

After the SME and I discussed the background information, I began reading journal articles and policy documents and taking my own notes. I noted information that seemed useful and appropriate for the brochure as well as information that I did not understand such as terms and the nature of different interagency collaborations. For this brochure, NIOSH had interagency collaborations with OSHA and the American Conference of Governmental Industrial Hygienists (ACGIH).

After I obtained information from these background documents, my writing mentor offered advice about the writing style and grammar that were appropriate for government writing.

**Analyzing Audiences**

Although identifying the intended audiences is a part of the NIOSH document development process, the process does not encourage direct contact with audiences. Writers are not prohibited from interacting with their audience(s), but interaction requires a great deal of time and money that is often unavailable. The step that most resembles audience analysis by writers is discussion among the document development team throughout the writing process. In Chapter 4, I will discuss the audience analysis challenge in depth.

The brochure was intended for the following audiences:

- Industrial hygienists
- Employers and management of chemical manufacturers and processors
- Workers receiving training and education on potential exposures to hazardous substances in the workplace
On learning about these intended audiences, I was concerned about how to write for them with my limited knowledge of their needs and expectations. Despite this concern, I believed that the background materials could provide insight into these audiences. Also, I still needed to clarify my understanding of the subject matter. Although I understood the SME’s explanations during our meetings, I knew that there would be much work involved in mastering the subject matter.

To address my concern about the audiences, I asked the SME and my writing mentor basic questions such as where the audiences would use the brochure and what they already knew. In response, my writing mentor and the SME noted examples of situations in which workers and industrial hygienists might read the brochure. However, I still did not fully understand what these audiences needed, already knew, or expected. I had read numerous NIOSH documents before I began the internship, but the skin notations brochure would be a shorter document than many of the documents I had read.

**Defining Brochure Objectives**

The SME and my writing mentor informed me during the first few weeks of the internship that it was unlikely that the brochure would be ready for internal review by the end of the 16 weeks. I would also be working on several other projects as I designed the brochure. With these factors in mind, my objectives for the skin notations brochure were the following:

1. To create a draft that was technically accurate
2. To increase the readability of the technically accurate draft by incorporating simple language to make the document usable by audiences on an 8th grade reading level
3. To condense the simply written and technically accurate version to meet the brochure length guidelines
4. To create a simple and attractive design for the brochure

The first three objectives were intended to reflect the basic thought process that I think any writer might have chosen. However, my fourth objective, to create a simple design, was almost imperative because I did not want to distract the audiences from understanding the core messages of the brochure.

**Writing the First Draft**

I began writing the first draft at the beginning of Week 2. To decide what information to include, I used the structure of the outline provided by the SME (Appendix 5). I also tried to picture the different audiences reading and using the finished brochure. However, trying to picture my audiences proved futile because I did not know any factory workers, and the DDB industrial hygienists were the first I had ever met. I did plan to ask DDB industrial hygienists to be internal reviewers, but that would not occur until after the document was already written.

As I wrote the first draft, I met with the SME about twice a week for half-hour meetings to seek clarification on appropriate content for the brochure. The SME was usually available and always provided clear and complete answers. Still, I had trouble understanding the subtle differences between the major types of health effects caused by hazardous chemicals. I e-mailed my first draft to the SME at the beginning of Week 4 primarily to request feedback on technical accuracy but also to obtain general feedback.
Feedback on the First Draft
The SME returned my draft with his comments later in Week 4 (Appendix 6). He commented that my thorough draft offered a clear indication of what information I had and had not mastered. He also said that the basic structure was fine. My only disappointment was that I had not mastered the subject matter quite as well as I thought.

The SME’s comments addressed several aspects of my first draft. The most important aspects were issues with terms and background information that I used to explain the inadequacies of the current and previous notations. One example of inappropriate information was a comparison of NIOSH and ACGIH skin notations. In comparing these skin notations, it could upset members of both organizations by unnecessarily exposing their previous setbacks to the public.

After I addressed the SME’s changes, I sought feedback from my writing mentor on readability and style. She indicated that the draft was too technical and did not convey the basic purpose of the brochure to her, let alone to workers and industrial hygienists who needed to understand it.

One of the major problems with the draft was that the introduction did not immediately state what the skin notations were and why NIOSH was updating them. The other major issue was my inclusion of unnecessary background information in several areas of the draft such as the estimated annual cost of treating contact dermatitis. An example of a language revision was the replacement of the word “mechanisms” to describe skin notations with something simpler like “tools.”

Accomplishments While Creating the First Draft
During the process of writing the first draft, I started to master the subtleties of the subject matter. However, I was still learning how to phrase the information appropriately for technical accuracy and how to organize it to directly state the point and sustain the audience’s attention.

Writing the Second Draft
As I began writing the second draft at the beginning of Week 6, I kept many of the headings and information from the first draft. The only sections I deleted were those discussing the historical development of skin notations and the scientific tests that generated the information used to assign skin notations. Both sections were inappropriate because they would raise too many questions that the brochure would not have enough space to answer.

As I worked on the second draft, I imported a copy of the brochure draft from Microsoft Word into Adobe InDesign 2.0 to determine whether it fit within the 5-7 page document length guideline. Adobe InDesign 2.0 is a desktop publishing software program that is essentially a more sophisticated version of Adobe PageMaker. I had used PageMaker extensively as a part of my course work for Information Design and for projects at my graduate assistantship. The tentative dimensions I chose for the brochure were 5” x 8” because I could easily adjust these dimensions to fit within The Pocket Guide, if necessary.

Working with InDesign helped me make information design decisions by showing how difficult it would be to introduce complex definitions using insert boxes. Insert boxes are boxes usually placed to the side of text which define terms introduced in the text without interrupting the flow.
After I placed all the text, the brochure covered roughly 12 pages without graphics—far too much space.

Another problem was that with so many insert boxes containing definitions for key terms, it was difficult to focus on the core messages that the brochure needed to communicate. As I started to revise this version of the second draft, I focused so intensely on simplifying and clarifying the language that my progress was impeded.

**Experiencing Burnout**

Reading the second draft aloud assisted me in converting the brochure information from technical language into simpler language. However, I started to feel burned out from concentrating so hard to clarify the subtle differences between the types of health effects from skin exposures. Fortunately, I had other projects and activities such as the *Chartbook* and the *Control Banding* poster to divert my attention from the skin notations brochure.

**Continuing with the Second Draft**

I submitted copies of the second draft to the SME and my writing mentor for feedback at the end of Week 5. Appendix 7 presents the second draft with the SME’s feedback. The SME commented that the draft was much better than the first draft. However, he suggested that I improve the clarity of technical terms in several areas. My writing mentor indicated that the draft contained too much technical information and was generally difficult to read.

My writing mentor identified two problems. The draft contained too many headings and the language describing the effects of hazardous chemicals was above the 8th grade reading level. Two unnecessary headings were “Challenges to Current Skin Notations” and “Applications of Improved Skin Notations.” Both of these were beyond the basic scope of the brochure.

She suggested that I condense each section to 25 words or less to capture what I really wanted to communicate to my audiences. She also gave me a book on readability to help me simplify my writing.

I took my writing mentor’s advice and wrote a condensed version that I showed her a week later. She complimented me on my progress, but said it still was not communicating the basic messages that we really wanted the brochure to convey.

When we discussed the condensed draft, my writing mentor explained that it still read like a report rather than a brochure that our audiences could casually flip through and understand. One issue was that I still needed to add transitions between sentences to make the content flow. Her second suggestion was that although my introduction was improving, it still did not convey the purpose of the brochure as concisely as necessary. The last major area we discussed was the need to use simpler language to describe “combined effects,” which result when hazardous chemicals have two or more types of effects (such as local and systemic). Describing combined effects was difficult because the SME was still determining what the notation for combined effects should be.

At this point, we decided to wait until the *Chartbook* was complete before resuming work on the brochure. In the meantime, I focused on editing the *Program and System Effectiveness* report.
Accomplishments While Creating the Second Draft
My biggest improvement in creating the second draft was in placing the text in InDesign so that I could start to see the brochure from the perspective of the audiences. Although both the text and the design needed much more work, I was very comfortable using InDesign to make the brochure audience-friendly.

Revisiting the Brochure
When the SME, my writing mentor, and I revisited the brochure three weeks later, at the end of Week 11, we devised five questions that the brochure should answer and used these questions as the main headings. These questions/headers included the following:

- What are skin notations?
- Why are they used?
- Why is NIOSH changing them?
- Why are the new notations better?
- What will the new notations look like?

Although I found this meeting helpful, I was slightly frustrated with myself because after 10 weeks of working on this project I still had not figured out how to write the brochure information appropriately.

I also did not know how to gauge my progress on the brochure. When I asked the SME and my writing mentor how they felt about my work, they both reassured me that my progress was satisfactory and that writing for these audiences was a difficult task. After I heard this from both of them, I felt a bit more relieved. Both of them had been frank in the feedback they had given me to that point.

Preparing to Write the Third Draft
Before I began writing the third draft, I reread my writing mentor’s comments and revisited the last draft of copy. Also, after I met with my writing mentor and the SME, they informed me that there was a slight change in the intended audiences. The project officer and SME had informed my writing mentor that it would be read primarily by industrial hygienists—not workers. This adjustment meant that I could assume that the audience knew more about the concept and use of skin notations.

The shift in focus to industrial hygienists did not change my approach to writing the third draft. I still wanted to simplify my writing so that the information would be usable by workers.

Writing the Third Draft
I began writing the third draft shortly after the meeting with the SME and my writing mentor (end of Week 11). My objectives for the third draft were to write in a simpler style throughout the draft and to prepare the draft for internal review. My writing mentor mentioned that I also needed to concentrate more on improving the organization of information than before. She explained how organization was just as important as content because we did not want to confuse our audiences.
As mentioned earlier in this chapter, the introduction was one section of the brochure I continually revised. The only other section that needed slight reorganization was the section that presented the four major types of effects covered by the new notations.

I decided to start the third draft by answering the questions developed by the document development team. As I created this draft, I also sought feedback on the brochure layout from a graphic design specialist in DDB and my writing mentor. However, I did not seek feedback on the third draft from other members of the Editorial Team because I wanted to improve the text and design a bit more before doing so.

I worked on the third draft for about 2 weeks before I sent a copy to the SME for feedback on technical accuracy. In the meantime, I continued designing the layout for the brochure using Adobe InDesign. At the end of Week 14, I gave my writing mentor a copy of the draft with the SME’s comments. My writing mentor’s feedback on this draft was positive with regard my progress, but included rewording of several parts to offer examples of the type of simplicity that she knew I still needed to achieve with my writing.

For example, the introduction of my third draft said the following:

NIOSH has new information about the effects of hazardous chemicals on exposed skin. This new information is important to all workers and employers whose skin is exposed to hazardous chemicals in the workplace. Skin exposures may lead to serious illnesses, injuries, skin diseases, and also economic loss. For example, dermatitis accounts for 10% to 15% of all occupational illnesses. The estimated annual cost of dermatitis-related problems is $1 billion.

My writing mentor suggested that I reword my introduction as follows:

Workers may suffer mild to serious health effects when their skin is exposed to hazardous chemicals at work. These effects may be localized (affecting one area of the body) or systemic (affecting the entire body). Localized effects may include dermatitis, skin corrosion, and sensitization. The effects of skin exposures to hazardous chemicals at work cost employers and workers about $1 billion each year. These exposures may result in serious disabilities for workers and even death.

The immediate difference I noticed was that my writing mentor’s version used simple language that I previously would have considered too colloquial for this brochure. In particular, I never would have used the phrase “mild to serious health effects” because I did not think “mild” expressed enough precision. So it was at this point that I really understood how my writing mentor wanted me to write.

**Continuing with the Third Draft**

As I continued to work on the third draft, I paid close attention to the areas that my writing mentor had revised using her simpler, business-like writing style. I also strived to achieve more balance between technical accuracy and simple language. To ensure that I had not lost sight of the big picture for the brochure, I revisited the outline that the SME provided during Week 1, my notes on previous drafts, and background materials.
During this time, I started to work on the draft exclusively in InDesign, as opposed to revising the copy in Microsoft Word. Not only did I want to see the brochure from the perspective of my audiences, I also wanted to add more graphics to illustrate important concepts from the text.

Two areas for which I especially wanted to use graphic illustration were (1) how skin notations appeared in the *Pocket Guide* and (2) the difference between two of the major types of health effects of skin exposure to hazardous chemicals.

To help me understand who the workers in my audience were and what types of reading comprehension skills they had, I viewed a teleconference on health literacy during Week 16. The teleconference featured videotaped segments of workers and health care patients answering questions about written directions that I would have considered to be below the 8th grade reading level. I was surprised by the difficulty that these workers experienced understanding the information.

The teleconference taught me that even if workers could read documents, it did not mean that they understood or could use them. After the teleconference, I found it easier to think about my work from the perspective of the audiences.

I showed my most recent draft to my writing mentor at the end of Week 16 (see Appendix 8), and she said that the draft was much better. However, the areas I needed to improve were the table presenting the new system of skin notations and a couple of sentences in the introduction. The introduction needed to hook the audience and give them an immediate reason to continue reading. Overall, I made a substantial amount of progress on the brochure during the internship because at the end of the 16 weeks required for the MTSC program, the brochure was almost ready for internal review.

**Accomplishments While Creating the Third Draft**

By writing the entire brochure content in a simple and business-like style, I had finally written what my writing mentor believed to be a usable audience-appropriate brochure. Furthermore, I had created a simple attractive design for the brochure that the SME and my writing mentor agreed would be effective. Finally, the health literacy teleconference really opened my eyes to the difficulties that many of the workers in my audience might experience in using my brochure.

**Summary of the Brochure Creation Process**

After 16 weeks of work on the brochure, I simplified complex information about skin exposures into two single-spaced Microsoft Word pages and created an attractive layout for the information using Adobe InDesign.

The most significant challenges I faced while creating the brochure were understanding the complexities of the subject matter, my audiences, and what language and background information was appropriate for NIOSH documents.

As I worked on the brochure, I was also spending time on the *Chartbook* and other DDB projects. The *Chartbook* was a priority that required a tremendous effort from the entire Editorial Team.
Writing the brochure copy and designing the layout provided valuable experience (1) writing complex technical information in simple language, (2) deciding how to phrase information in an appropriate way that would not offend partner organizations, and (3) using sophisticated desktop publishing software.
Chapter 4: Reflections on the Internship

In this chapter I compare the NIOSH numbered policy document development process with the guidelines of the MTSC problem-solving model and reflect on what I learned during the internship. In particular, my lack of interaction with my audiences had a significant impact on my writing and design of the brochure layout.

Comparing the Problem-Solving Model and NIOSH Model

The problem-solving model is one of the tools that MTSC students are taught to use to create communications. Figure 3 presents the major steps of the problem-solving model and the activities involved in each major step. In contrast to the problem-solving model, NIOSH has several processes for creating different kinds of communication products. Figure 4 identifies all the stages and steps involved in creating NIOSH numbered policy documents such as the skin notations brochure. Figure 5 presents a point-by-point comparison of the NIOSH and problem-solving models.

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Figure 3. The MTSC Problem-Solving Model

The two most obvious ways in which the NIOSH model is different from the problem-solving model are that the NIOSH model does not encourage direct contact with the audience(s) for audience analysis and lacks usability testing. Although I did not complete the brochure during the 16 weeks of the internship, the following sections compare the planning and drafting processes of the two models from the frame of reference of the problem-solving model.

---

| Stage I Planning | Step 1: Prepare the topic concept plan (TCP)  
Step 2: Send TCP to Div/Lab directory for review and approval  
Step 3: Present TCP to NIOSH director and lead team  
Step 4: Revise TCP  
Step 5: Enter data into NIOSH Communication Products Tracking system |
|-----------------|------------------------------------------------------------------------------------------------|
| Stage II Preparation | Step 6: Establish the document development team  
Step 7: Prepare the document and dissemination plan  
Step 8: Prepare cover design |
| Stage III Review and Clearance | Step 9: Conduct internal review and policy review, if needed  
Step 10: Copy edit and proofread the revised draft document  
Step 11: Send document to Div/Lab director to review and approve for external review  
Step 12: Obtain clearance for external review from NIOSH Office of the Director (OD)  
Step 13: Send document for external review  
Step 14: Conduct editorial review  
Step 15: Send document to desktop publisher  
Step 16: Obtain Div/Lab review and approval of final document  
Step 17: Obtain final approval and clearance to produce or publish from NIOSH OD  
Step 18: Make changes as required |
| Stage IV Final Production | Step 19: Prepare final document  
Step 20: Prepare document for printing  
Step 21: Prepare document for NIOSH Web site |
| Stage V Dissemination | Step 22: Obtain clearance from NIOSH OD for document dissemination  
Step 23: Disseminate |
| Stage VI Evaluation (if desired) | Step 24: Conduct summative evaluation |

**Figure 4.** The NIOSH Numbered Policy Document Development Process.
<table>
<thead>
<tr>
<th>Problem-Solving Model</th>
<th>NIOSH Model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Defining the Problem</strong></td>
<td><strong>NIOSH Model</strong></td>
</tr>
<tr>
<td>▪ Specify the purpose of the communication (organizational function, reader’s use, writer’s intention, etc.)</td>
<td>▪ Prepare and send 1-page topic concept plan (TCP) to the division director, NIOSH director, and lead team for review and approval (Steps 1-3)</td>
</tr>
<tr>
<td>▪ Analyze the context (constraints, conventions, etc.) and audience(s)</td>
<td>▪ Revise the TCP, if necessary (Step 4)</td>
</tr>
<tr>
<td>* The problem-solving model encourages direct interaction with the audiences during audience analysis</td>
<td>▪ Enter data into NIOSH Communication Products Tracking System (Step 5)</td>
</tr>
<tr>
<td></td>
<td>* Using the NIOSH model, writers and other project collaborators examine the audiences after the TCP has been approved</td>
</tr>
<tr>
<td><strong>Designing the Solution</strong></td>
<td></td>
</tr>
<tr>
<td>▪ Start to decide on medium, form, style, production, distribution, etc.</td>
<td>▪ Establish the document development team (Step 6)</td>
</tr>
<tr>
<td>▪ Gather information through interviews (including members of the target audience), print or online sources, etc.</td>
<td>▪ Gather necessary information and prepare the document (Step 7)</td>
</tr>
<tr>
<td>▪ Create drafts, design the layout, etc.</td>
<td>* includes identifying and discussing the target audience(s), but usually not direct interaction with them</td>
</tr>
<tr>
<td>* The problem-solving model promotes usability testing throughout the solution design process</td>
<td>▪ Prepare the cover design (Step 8)</td>
</tr>
<tr>
<td><strong>Testing the Solution</strong></td>
<td></td>
</tr>
<tr>
<td>▪ Design the test/review procedures</td>
<td>▪ Distribute the document to the necessary people for the internal and external review processes (Steps 9-13)</td>
</tr>
<tr>
<td>▪ Present the pilot version to the target audience or the reviewers</td>
<td>▪ Conduct editorial review based on feedback from the reviews (Step 14)</td>
</tr>
<tr>
<td>▪ Gather and analyze the responses</td>
<td>▪ Send document to desktop publisher (Step 15)</td>
</tr>
<tr>
<td><strong>Implementing the Solution</strong></td>
<td></td>
</tr>
<tr>
<td>▪ Revise the solution based on the test or review results</td>
<td>▪ Obtain approval and clearance from the necessary people (division director, OD, etc) to produce and publish the document (Steps 16-17)</td>
</tr>
<tr>
<td>▪ Produce, package, and deliver the product</td>
<td>▪ Make changes to the document as required (Step 18)</td>
</tr>
<tr>
<td><strong>Evaluating the Solution</strong></td>
<td></td>
</tr>
<tr>
<td>▪ Design and use an evaluation method</td>
<td>▪ Evaluation is optional (Step 24)</td>
</tr>
<tr>
<td>▪ Analyze the results</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5.** A Comparison of the Problem-Solving and NIOSH Model.
Defining the Problem

In this first step of the problem-solving model, writers specify the purpose, context, and audience(s) for a communication product. Based on this information, writers form objectives. As described in Chapter 3, the purpose and context for the brochure had already been established prior to my arrival. The SME had already submitted the topic concept plan, a 1-page summary of the project purpose, and was ready to begin working with document development team and me. The following sub-section compares the audience analysis methods of the NIOSH and problem-solving models.

Analyzing Audiences

Using the problem-solving model, audience analysis is intended to identify (1) who and where the audiences are and (2) how the technical communicator can best reach them. Audience identification is the analogous step in the Preparation Stage of the NIOSH model. The key difference is that audience identification does not necessitate or encourage direct interaction with a writer’s intended audience.

There are no specific criteria or rules for audience identification, but it generally involves (1) determining who the audiences are and what they are like and (2) choosing an appropriate reading level for the target audiences—usually the 8th grade level.

Writers in EID must receive authorization from the project officer and have prior field experience to conduct surveys or focus groups to obtain input from their audiences. If writers do not have field experience, they must arrange for surveys to be conducted through the Division of Surveillance Health and Field Studies (DSHEFS), NIOSH or focus group meetings to be conducted through the Training and Educational Systems Branch (TESB) in EID, NIOSH. TESB typically arranges six or seven focus groups to collect a sufficient amount of information from the audiences.

Most often, NIOSH writers do not have the time and money to arrange for surveys and focus groups to be conducted. Obtaining information through surveys or focus groups usually takes at least 6 months. Considering the length of time required for the internal and external document review processes, many writers cannot sacrifice 6 months to consult their audiences. In addition, field work such as this is expensive. Sometimes partner organizations in industry contribute money for the testing of communication products with target audiences, but this is not usually the case. Therefore, if project officers decide that surveys and focus groups are necessary, they must make the costly expenditure from their own limited project funds.

Taking into account the aforementioned time and money concerns, NIOSH writers usually determine the best way reach target audiences by doing the following:

- Considering the feedback from reader interest cards that are inserted in documents
- Reading background documents
- Using their own expertise
- Seeking the expertise of other document development team members
The critical difference between the problem definition processes of the two models is that the NIOSH model encourages an indirect approach to audience analysis while the problem-solving model promotes direct writer-audience interaction. The next section compares the processes that the two models use to design communication products.

**Designing the Solution**

In designing the solution, the problem-solving model suggests the following activities:

- Make preliminary decisions about medium, form, style, production, and distribution for the communication
- Gather information
- Draft a solution
- Design finished products

The objective of this step is to create a pilot version of the communication that can be tested. The analogous steps in the NIOSH model are document preparation and cover design preparation (Steps 7 and 8).

For the most part, the processes that the NIOSH and problem-solving model use to design solutions are the same. The problem-solving model, however, encourages usability testing, when appropriate. As I learned in *Introduction to Technical and Scientific Communication*, usability testing can be defined as evaluating the degree to which users like and are able to use a product. If I had been permitted to consult my audiences at each milestone, perhaps I would have proceeded more productively.

Adapting to the NIOSH model of writing forced me to rethink my communication strategy. The next section describes what I learned about applying the problem-solving model to my internship duties.

**Applying the Problem-Solving Model**

The most important lesson I learned about the problem-solving model was that it is not a rigid process. Rather, the model is a guide that is often altered and rearranged in the manner appropriate for the particular project and work environment.

I had other projects to complete throughout the time I worked on the brochure, and the other members of the document development team were working on large ongoing projects as well. Therefore, the other team members and I did not follow a consistent linear process during the 16 weeks. However, my knowledge of the problem-solving model helped me identify and resolve possible gaps in the NIOSH process as I created the drafts. As discussed in Chapter 3, the most significant gaps centered on audience analysis. Recognizing gaps in the NIOSH audience analysis process revealed important issues that I discussed with other members of the document development team to determine potential effects on the usability of the brochure.
Just as I learned to adapt the problem-solving model to the demands of my internship projects, I also learned to adjust my writing to a style suitable for NIOSH publications. The next section summarizes the lessons I learned about government writing.

Learning about Government Writing

On the basis of my recollection, my internship journal, and feedback from the SME and my writing mentor, the following were the main writing challenges I overcame as I created the brochure.

1. Avoiding “buzz” words inappropriate for CDC documents

NIOSH writers avoid using many buzz words in documents to be distributed in the workplace. These words are inappropriate because they may unintentionally induce panic or provoke emotional responses. The following are three examples of buzz words and appropriate replacements:

- Warn (use the word “inform”)
- Harm (use the phrase “have adverse effects”)
- Health threat (use the phrase “health effect”)

In each of these cases, the buzz word is “loaded,” which means that it tends to produce an unintended emotional response.

2. Explaining technical terms in a simple way

As I composed the brochure, I translated difficult technical terms into simple language. Examples include:

- systemic effects of chemicals versus local effects of chemicals
- local effects of chemicals versus sensitization effects of chemicals
- skin absorption versus skin contact

I had to find ways to provide simple definitions and explanations for these concepts without interrupting the tone of the draft. The complexity of these concepts was such that I generally found it difficult to thoroughly explain them in one paragraph. However, the more that I learned about the subject matter, the easier it became to describe the concepts using simple language.

3. Deciding what information was appropriate in light of organizational missions

Just because scientific research is useful and valid does mean that NIOSH can include or defend it in a policy recommendation. This is true because NIOSH is a semi-regulatory agency, and there are practical realities that scientists must consider when creating policy recommendations. For example, it might be more protective to recommend an extremely low airborne concentration as the exposure limit for a hazardous chemical. However, NIOSH currently has no methods for detecting such a low concentration in air.
4. Using precise language
NIOSH writers must be sensitive to all the meanings and connotations of the subject matter they are writing about so that they convey the appropriate messages to the target audiences. As I wrote the brochure, I encountered two challenges related to language precision.

The first challenge was familiarizing myself with the nuances of scientific language describing skin exposures to ensure that I simplified the language without changing its meaning. For example, when my writing mentor and I considered changing the name of the category “surface effects” to the more recognizable name “local effects,” we discussed the connotations of the name “local effects” with the SME to make sure that it conveyed the same meaning.

The second challenge was deciding the level of force that statements needed to convey. For example, as I worked on the first two drafts of the brochure, I was not sure whether to state that the skin notations “will be,” “should be,” or “are intended to” protect workers. My writing mentor and the SME helped me overcome this challenge by teaching me how to use policy-oriented language appropriately in NIOSH communication products.

In light of what I learned about government writing, a final piece of advice that I would offer to technical communicators considering employment at NIOSH is to venture beyond the scope of what they are required to know about their branch and division to do their job. It is equally important to achieve an understanding of the role that NIOSH and related organizations play in the occupational safety and health community. NIOSH represents so many disciplines that it is often difficult to understand the alignment of all the work of the different branches, divisions, and partnerships. But the more technical communicators understand about the different components of the organization, the more likely they will be able to appropriately write and frame the information in their communication products.

Closing Thoughts
My internship experience at NIOSH provided an excellent opportunity for me to begin my career in environmental communication. The successes and failures I experienced in my struggle to develop appropriate language for the skin notations brochure improved my ability to understand and translate the complex language of scientific documents. I am sure that I will be expected to simplify similar scientific documents in my future work as an environmental communicator.

As an individual who entered the MTSC program without a major or minor degree in a scientific area, I think that my supplemental course work in environmental science provided a solid foundation for my work at NIOSH. I did not need to recall any specific information that I learned in my environmental science courses, but my environmental science knowledge helped me to understand the big picture of what toxicology is and why it is important. I learned about toxicology, the study of toxic substances and their impact, in *Environmental Biology*, *Principles and Applications of Environmental Science*, and *Environmental Law*.

The core courses of the MTSC program also prepared me to work in a professional environment through incorporating professional skills such as writing memos and document specifications into the curriculum. I also learned the value of educating people about the breadth of technical communication and all of the ways that I could contribute to NIOSH beyond writing and editing.
documents. Likewise, I developed professional skills during the internship. The most useful skill I learned was preparing personal interim deadlines to ensure that projects stayed on schedule.

I also appreciated the fact that my internship supervisor and writing mentor did not micromanage me. As a member of the DDB Editorial Team, I felt like a colleague rather than an intern. This independence included knowing that my successes were most often my own, and that the Editorial Team and other DDB scientists depended on and trusted me to create an important policy-related brochure. I appreciate the internship experience NIOSH afforded me, and I look forward to using the writing, editing, and desktop publishing skills I learned in my future work.
Appendix 1

**Status Report: “Program Effectiveness” Primer**

To: John Palassis  
Cc: Paul Schulte  
From: André Allen  
Week of 4/26

This status report briefly describes the progress I have made on the primer this week and what my next steps are.

**This Week**
The following are the main things I have done with the Redinger report (beginning part):

- Continued with basic edits—For the past two weeks I have been working on editing and simplifying parts of the document that stood out immediately (i.e. grammatical errors, long paragraphs, terminology and topics that are overly technical, and information that should go in appendices)
- Began writing overviews to forecast what each section will discuss
- Began more in-depth edits: There are lots of sentences that are too loaded with information and need to be broken down to facilitate comprehensibility.
- Began adding tables, basic charts wherever possible to break up the text and illustrate concepts. I am definitely going to create a timeline for the section “Development of Management Systems for OHS” to eliminate much of that cumbersome text
- Inserting comments/questions into the document: I have inserted lots of comments for questions/suggestions I have. I plan to meet with you early next week to get clarification on some of the issues.

**Next Steps**
I still have lots of work to do on this document. I think some of the existing graphics can be simplified and improved to make them more meaningful to the audiences. In addition, I need to check with you after I complete all the tasks I have been working on thus far and determine what information, if any, can be omitted.

My specific plan for next week is to have all the section overviews, summarizing paragraphs (at the end of major sections), and basic sentence structure-type edits completed. In addition, I plan to meet with you or send you a draft of a section with my comments for you to answer when you have time.

If you have any questions or comments, just e-mail me or give me a call at x-8354.

Thanks,  
Andre
Appendix 2

Document Specification: Comprehensive Program and Management System (CP/MS) Effectiveness Project

To: John Palassis et al.
From: André Allen

The purpose of this document specification is for me to (1) communicate my understanding of the expectations for the Comprehensive Program and Management System (CP/MS) effectiveness project and (2) suggest basic parameters for the project deliverable, a booklet.

- **Situation:** John Palassis and Paul Schulte have books, presentations, and a pilot study report that explain new ways of measuring CP/MS effectiveness. The information in these sources was written for scientists and is presented in a complex way. The program and system effectiveness information would be useful to occupational professionals if it were presented in a simpler way.

- **Purpose:** The booklet is intended to be a primer to help organizations understand the benefits of new measures for the “success” of OS&H programs. Organizations will need to know about CP/MS effectiveness when ANSI Z10 requirements are implemented in the near future.

- **Audiences:** Union stewards, health and safety professionals, industrial hygienists

- **Medium:** Booklet (number of pages and dimensions to be determined).

**Core Contents of the Booklet**
The following are the major topics that the booklet needs to cover, although not necessarily in this order:

- Introduction
- OHS programs vs. management systems
- Intro to ANSI Z10 requirements
- Important indicators of CP/MS effectiveness
- Example cases to illustrate the benefits of the new measures of CP/MS effectiveness
- Drawings, charts, etc., as relevant.
- References

**Relationship to Other Documents**
This document will complement NIOSH publication No. 2001-119, *Guide to Evaluating the Effectiveness of Strategies for Preventing Work Injuries: How to show whether a safety intervention really work* and NIOSH publication No. 2004-135, *Does it Really Work? How to evaluate safety and health changes in the workplace.*
As I interpret the purpose of the CP/MS Effectiveness Project, the booklet that I create will be different from the other related NIOSH publications because (1), it will focus on the ways to measure the success of OHS programs and systems, and (2), it will be presented in a way that is easier for audiences with little or no technical knowledge to understand.

**Software**
I plan to create this document using MS Word because it will allow everyone involved in the project to manipulate it.

**Timeline**
For the next week or so (Mar 22-Mar 30ish), I will have at least 3 hours/day to work on this project. However around March 30th or possibly the following week, I must resume work on the skin notations brochure. Therefore the time I have available to work on this project after the week of March 29 may vary.

I plan to touch base with John Palassis at least once every week after March 29 to discuss the status of this project.

**Potential Challenges**
At this pre-writing stage, the parts of the booklet writing/ information design process that will probably be the most challenging are:

- Presenting analytical information about CP/MS effectiveness to audiences in a non-intimidating way (i.e. quantitative and statistical significance measures)
- Introducing program effectiveness information without making the past efforts by NIOSH and other related organizations look unfavorable
- Understanding exactly what information and graphics would be most useful to the intended audiences—I have limited knowledge of their backgrounds and needs

**Resource Personnel**
The following are all the people who will be involved in this project.

Andre Allen – writer/editor
John Palassis – project officer/ scientist/ information source/ reviewer
Paul Schulte – scientist/ information source/ reviewer
Anne Hamilton – editorial reviewer
Heinz Ahlers – project coordinator/reviewer
Vanessa Becks – graphic design consultant
Susan Afanuh – editorial reviewer

**Written Sources of Information for the Booklet**
1. Printouts of PowerPoint slideshows: Program vs. System Effectiveness, ANSI Z10 requirements
2. *Guide to Evaluating the Effectiveness of Strategies for Preventing Work Injuries: How to show whether a safety intervention really works*
6. *14 Elements of a Successful Safety and Health Program.*

**Next Steps**

John, after you read this doc spec, I plan to meet with you to determine whether we are both on the same page in regard to expectations for this project. I will continue reading and taking notes from the background materials so that I can have a better idea what information I want to put in the first draft.
Applying Control Banding Principles to Environments that may be Immediately Dangerous to Life and Health

Alan J. Weinrich
National Institute for Occupational Safety and Health
Education and Information Division, Cincinnati, Ohio, USA

Immediately Dangerous to Life and Health (IDLH) Environments

IDLH environments contain atmospheric concentrations of any toxic, corrosive, orphysetic substance that:
- Could lead to a 3 minute or less post exposure to an IDLH environment.
- Would last longer than a 3 minute exposure to an IDLH environment.
- Would interfere with a worker's ability to escape from the dangerous atmosphere.
- Would cause immediate or delayed injury to a worker.

Transient hazards are not considered important in IDLH environments if they may impair the worker's ability to escape.

Control Banding

Control banding is a science-based, innovative, and simplified approach to protecting worker health that does the following:
- Identifies hazardous substances and their risks.
- Provides a systematic approach to control banding.
- Identifies specific potential exposure agents.
- Identifies specific potential exposure agents.
- Provides a systematic approach to control banding.

Early Uses of Control Banding in Potentially IDLH Environments

Certain high hazard situations represent special cases where non-traditional applications of control banding principles seem likely to be of value, especially to protect the development of an IDLH environment.

Proposed Control Banding Procedures for Potential Chemical Releases

Anticipate conditions that may cause IDLH environment
- Confined spaces
- Fires and explosions
- Uncontrolled chemical releases (example for ECP)

Identify specific potential exposure agents
- Anticipate or measure exposure levels if possible

Determine hazard bands
- 1. Hazards (P) 2. Exposure (E) 3. Health (H)
- For uncontrolled chemical releases assess the worst case scenario

Apply a hierarchy of exposure control practices (ECP)
- Engineering
- Substitution or use of less hazardous material
- Minimize quantities
- Closed or encased processes
- Other controls
- Administrative
- Emergency Action Plan
- Worker education
- Personal Protection
- SCBA's required for IDLH entry
- Non-exposure hazards determination
- Level of bodily protection

Applying Control Banding as Part of a Toolbox

To apply the frequency of ECPs newly as part of a toolbox, without expert advice, research first must verify that the practices will effectively control exposure under a wide variety of circumstances.

The toolbox should include validated mathematical and physical models, non-linear models, and recommendations for using national or local exposure standards and guidelines.

Control banding principles are likely to be the most effective in reducing the likelihood that an IDLH environment will be created.

Applying control banding principles should be reflected in oper manual processes, training, and sustained actions.

Supplementing national control banding procedures with expert occupational hygiene advice may greatly enhance the options for occupational hygiene improvement.

At a minimum, occupational hygienists responsible for applying control banding strategies should be trained and seek input from occupational hygiene, health and safety, and health professionals, including the use of reference data, such as the NIOSH IDLH values, and the use of professional judgment in the identification of potentially hazardous agents.

Recommendations

Anticipate and prepare in advance for potential exposures to NPCs and IDLH environments.

Always prepare for exposure to any potential high hazard environment, and take appropriate steps to protect workers when they are exposed to such environments.

The NIOSH IDLH values or other reliable, acute exposure guidance should be applied to control banding, when available.

When the chemical is selected, the most rigorous hazard band is assumed and the most protective control banding practices should be applied.

Acknowledgements

The authors are the following NIOSH staff for their valuable contributions:
Mark D. Hoester, Thomas J. Lentz, and Mark W. Allen, who reviewed the user's perspective, and Andrew J. Allen, who completed the editorial review.
# Appendix 4

## Pocket Guide to Chemical Hazards

A sample page from The Pocket Guide (the old skin notations are circled)

| Chemical name, structure/formula, CAS and NIOSH numbers, and DOT ID and guide numbers | Synonyms, trade names, and conversion factors | Exposure limits (TLV unless noted otherwise) | INHALATION | PHYSICAL DESCRIPTION | CHEMICAL AND PHYSICAL PROPERTIES | INCOMPATIBILITIES AND NOSERETRIES | MEASUREMENT METHODS
|---|---|---|---|---|---|---|---
| Dimethylfornamidone | Dimethylformamide, N,N-dimethylformamide | NIOSH/OSHA 10 ppm | 50 mg/m³ | Colorless to pale-yellow liquid with a faint, anise-like odor. | MW: 71.16; MP: 50°C; Vp: 14°C; Sp: 0.748 g/cm³ | Carbon tetrachloride, other halogenated compounds in contact with non-flammable materials | See page 91 for Table 1
| Dimethylformamide | NIOSH/OSHA 10 ppm | 50 mg/m³ | Colorless to pale-yellow liquid with a faint, anise-like odor. | MW: 71.16; MP: 50°C; Vp: 14°C; Sp: 0.748 g/cm³ | Carbon tetrachloride, other halogenated compounds in contact with non-flammable materials | See page 91 for Table 1
| Dimethylphosphate | NIOSH/OSHA 5 mg/m³ | 2000 mg/m³ | Colorless, oily liquid with a pungent, aromatic odor. | MW: 394.2; MP: 54°C; Vp: 15°C; Sp: 0.989 g/cm³ | Phosphate esters, organophosphorus compounds, and organophosphorus compounds in contact with non-flammable materials | See page 91 for Table 1

*Note: All chemicals listed are extremely toxic and should be handled with care.*
Appendix 5

PROPOSED OUTLINES FOR NIOSH BROCHURE:
Skin Notations — Alerting Dangers from Occupational Skin Exposures

February 2, 2004

PURPOSES

- Provide an overview on skin notations (SNs), its current status, and challenges
- Introduce the NIOSH strategy for improving SN assignment and the standardized approach to be adopted to audiences of limited technical backgrounds
- Present uses of the improved SNs in protecting workers from chemical exposures

AUDIENCES

- Industrial hygienists and safety officers, occupational health practitioners, and other specialists involved in health hazard identification and evaluation
- Employers and management of chemical manufacturers and processors
- Workers receiving training and education on potential exposures to hazardous substances at the workplace

ELEMENTS

- Introduction
  - Occupational skin exposures: Worker injuries and economic loss
  - Identification of skin exposure hazards and dissemination of information

- SNs as an Alerting System
  - Definition, purposes and historical development of NIOSH SNs
  - Review on current status and application

- Challenges to Current SNs
  - Insufficient coverage of adverse health effects due to skin exposure
  - Inconsistency in assignment
    - Limitations by availability of scientifically sound supporting data
    - Lack of standardized approach and criteria in assignment process

- Potential Health Effects from Skin Exposure
  - Systemic toxicity and interruption of biological functions resulting from short- and long-term skin absorption of chemical substances
  - Localized irritation/corrosion on skin and dermatitic reactions
• Sensitization of skin and airways and allergic contact dermatitis
• Compromise of skin integrity as a barrier to chemical penetration

☐ A New Strategy for Improvement of SN assignment
  • Expansion of SNs and inclusion of parallel indicator categories
  • Development of clear, standardized criteria based on scientific principles for use in the evaluation of skin exposure hazards and SN assignment

☐ Information Available to Support SN Development
  • Field and clinical reports on cases of human exposures
  • Laboratory research: Whole animal studies and function-specific testing
  • Predictive quantitative structure-activity relationships

☐ Application of Improved SNs
  • For identification of industrial chemicals as skin exposure hazards
  • For consideration of strategies for chemical exposure controls
  • For training and education on health hazards present at the workplace

REFERENCES

Notes: We may consider using diagrams (e.g., tables, charts and boxes) and pictures to illustrate the types of adverse health effects resulting from skin exposures and scientific criteria to be used in SN assignment, as well as to elaborate key or relevant NIOSH products (e.g., HHEs and NIOSHTIC-2/RTECS databases).
Appendix 6

First draft
Skin Notations brochure

Introduction

Skin exposures to chemical substances in the workplace put workers at risk of experiencing undesirable health effects and developing occupational skin diseases. Workers’ skin may be exposed to chemicals through direct contact with contaminated surfaces, deposition of aerosols, immersion, or splashes.

Occupational skin exposures are also a concern because they may lead to worker injuries and economic loss. Contact dermatitis, for example, is one of the most common causes of occupational illness, accounting for 10 to 15 percent of all occupational illnesses at an estimated annual cost of $1 billion.

NIOSH is committed to providing the most current scientific information about skin exposures through its skin notations. This document presents the following information about skin notations:

- An overview on skin notations (SNs), its current status, and challenges
- An introduction of NIOSH’s strategy for improving skin notation assignment
- Recommended uses of the improved skin notations in protecting workers from chemical exposures

Skin Notations as an Alerting System

What are Skin Notations?

Skin notations are a mechanism used by occupational safety and health communities worldwide to alert workers and occupational professionals of potential hazards resulting from skin exposure to hazardous substances.

Purposes

The following are the purposes of NIOSH’s skin notations:

- To alert workers the chemical hazards present at the workplace
- To inform employers and workers about the adverse health effects that can result from dermal absorption of chemical substances
- To provide the most recent scientific information about skin exposures
- To reduce the occurrence of occupational skin diseases

Historical Development

NIOSH first adopted skin notations in 1989 as part of the Recommended Exposure Limits (RELs) and gave skin notations a “skin” designation in the NIOSH Pocket Guide.
to Chemical Hazards. “Skin” notations are indicators of compounds for which there is a significant risk of systemic toxicity from skin exposure.

In 2003 the American Conference of Governmental Industrial Hygienists (ACGIH) added a special notation for sensitizing chemicals. The ACGIH notation indicates sensitization of skin and/or the respiratory system. However, the ACGIH criteria used to assign the sensitizing notation is not described in any written publication.

Current Status of Skin Notations

NIOSH has identified and listed 143 chemical substances with a skin notation. The NIOSH Pocket Guide to Chemical Hazards is the primary resource for information about skin notations. The following are limitations of NIOSH’s current “skin” notations in the NIOSH Pocket Guide to Chemical Hazards:

- Notations are established based exclusively on the potential of a dermally absorbed chemical substance to contribute to systemic toxicity
- The provision of a single “skin” notation for systemic toxicity results in the notation’s use for other serious local dermal effects, such as corrosion and sensitization

Challenges to Current Skin Notations

NIOSH’s current skin notations provide a warning for possible absorption of chemical substances through skin that may potentially result in toxic effects. However, the current notations do not warn employers and workers about non-systemic effects. The improved skin notations are assigned systematically and provide information about non-systemic (local) effects of dermal absorption in addition to the information about systemic effects that is already being used.

Identifying Chemicals as Skin Absorption Hazards

The primary challenge to providing effective skin notations is the process used to identify chemicals as skin absorption hazards. There are two key problems in the process of identifying chemicals as skin absorption hazards:

1. Insufficient explanation(s) of undesirable health effects due to skin exposure
2. Inconsistent assignment of skin notations

Insufficient Explanations of Undesirable Health Effects

Insufficient explanations of undesirable health effects are one part of the challenge of identifying chemicals as skin absorption hazards. The explanations are insufficient in the following ways:

- Skin notations serve only as general qualitative indicators, providing little guidance beyond the possible presence of a skin absorption hazard
- Scientific information used in the initial assignment of current skin notations may have become outdated

Comment: The descriptions can be merged with “what are skin notations.”

Comment: As we already discussed, a direct comparison of NIOSH vs. ACGIH skin notations may not be appropriate. I think it will not be appropriate to make such a comparison. However, some are developing new notations to indicate allergic reactions due to skin exposure. If that’s the case, I would recommend that you find a way to merge all the information into a single table or list.

Comment: You need to explain what is “systemic” effect.

Comment: Try using “absorption” only in the context of systemic toxicity. Because “absorption” gives rise to the impression that you are talking about “skin penetration.” However, skin penetration and etc. does not require a complete skin penetration by the chemicals.

Comment: “Explanation” may not be the preferred word here. It seems that the new notations are going to describe the health effects, which is not the case.

Comment: The improved notations are still qualitative indicators of the problem of current notations. The improved notations include:

1. Insufficient coverage of local health effects.
2. Inconsistent criteria used in the assignment.
Skin notations need to be evaluated for their usefulness in predicting and describing the biological responses and health effects caused by mixtures of substances.

Inconsistent Assignment of Skin Notations

Inconsistent assignment of skin notations is the second part of the challenge of identifying chemicals as skin absorption hazards. Skin notations are inconsistently assigned mainly because of different criteria and emphases between the U.S. and European countries. A unified international standard needs to be set to resolve this problem. One way we can begin to improve consistency is for information on skin exposure characterization, health hazard identification, and risk assessment and management to be consolidated into a comprehensive source.

A final note on the introduction: it’s a good start and the structure is fine, but I think you need to work on putting similar information in the same place. For instance, I found discussions on the challenges to and limitations on the current skin notations at several difference places, which makes it difficult to the readers to quickly identify key messages. I am sure Anne will give you more editorial feedbacks.

Potential Health Effects from Skin Exposure

The chemical substances awarded with skin notations are those identified to pose a health threat to workers following skin exposures at the workplace. Workers exposed to chemical substances listed with skin notations may experience one or more of the following health effects:

- Systemic toxicity as a result of short- and long-term skin absorption
- Localized irritation/corrosion on skin and dermal reactions
- Sensitization of skin and Airways and allergic contact dermatitis

Note: You need to make clear that this is NOT an exclusive list – these three health effects are the most frequently observed health effects from skin exposure. There are other situations such as the compromise of skin structure that leads to a greater absorption of chemical substances, which may or may not be process visible to naked eyes.

A New Strategy for Improvement of Skin Notation Assignment

NIOSH proposes a new system of skin notations that reflect the current scientific knowledge on workplace skin exposures and effects. The system includes the following categories:

- SK-SYS: Hazard of systemic toxicity due to dermal absorption
Chemical substances with the SK-SYS notation have the potential to cause damage to specific organs or biological functions. Damage to biological functions could consist of effects such as weakening of the immune system from chemical exposure.

- **SK-DIR**: Hazard of direct effect(s) on the skin including irritation, corrosion, or compromising the integrity of the dermal barrier.

  Workers who use chemical substances with the SK-DIR notation should primarily be aware of the difference between the effects of irradiation and corrosion. The effects of skin irritation are often reversible (note: not always the case; so I added "often"), but the effects of corrosion are irreversible.

  One aspect of direct effect(s) and skin sensitization from chemical exposure is a compromise of skin integrity as a barrier to chemical penetration. (Note: I think what you want to say is: it is a concern when the dermal barrier is compromised because the structure and components of skin layers may be damaged at levels invisible to naked eyes. This is a problem because, while you can't see it and feel anything wrong, such damage may increase the skin absorption of the hazardous chemicals)

  Note: this category only provides information about the effects of single exposures to chemicals. The SK-SEN category was created to provide information about repeated/multiple exposures.

- **SK-SEN**: Hazard of allergic dermatitis (ACD) in exposed workers or sensitization of mucous membranes/airways due to dermal exposure.

  Chemical substances with the SK-SEN notation can cause dermatitis after repeated exposures, depending on the exposure limit of the particular chemical. (Note: you need to explain why this is a problem, i.e., because sensitization will lower the tolerance of a worker to dermatitic reactions caused by the chemical).

  A combined assignment is available to signify the presence of multiple skin hazards—by stringing the hazard categories together behind the SK notation. (Ex. SK-SYS-DIR)

  As new data, test methods, and understanding of toxicological mechanisms involved in dermal injuries become available, additional categories may be added to the skin notation. (Note: You are committing NIOSH to additional works again. I think in the policy document we were saying we want to consider new CRITERIA in the future, if you want you can say that this strategy and the structure of skin notations can be improved as new data, test methods and etc., become available. It seems to me this paragraph is a concluding mark and will be better presented near the end of the document.)
Bases of Skin Notation Assignment

The most important process in assignment of skin notations is the evaluation of potential health effects that may occur to workers if their skin was exposed to hazardous chemicals. The success of this process relies on the existence of scientific findings of good quality, and lack of data demonstrating health effects from skin exposures has contributed to many of the shortcomings introduced earlier. The improvement of skin notations is now possible because the scientific breakthrough in the past decades has made available information crucial to the evaluation, and this information includes: (1) the reports of clinical and field investigations on cases of workers’ exposures; (2) results of laboratory animal tests following scientifically validated protocols; and (3) data from alternative methods recommended such as bioassays that do not require animal sacrifice and predictive algorithms using mathematical models to relate the structures of chemical substances to toxic effects (structure-activity relationships). The presence of the scientific protocols by which these data were developed also allows NIOSH to develop standardized criteria that can be used to achieve systematic and consistent evaluation of the adverse impacts from chemical substances to workers’ health for the assignment of skin notations. These criteria include:

SK-SYS
Systemic toxicity resulting from skin exposures is generally tested using measures of chemical substances in animals. Observations of laboratory studies are reported as quantitative (numerical) data that are used in the assignment of skin notations.

SK-DIR
Direct effects of chemical substances on skin are reported as qualitative (non-numerical) descriptions summarized from the clinical observations of patients or experimental examinations of animals.

SK-SEN
Reports on the skin sensitization resulting from skin exposure to chemical substances are generally less available than those for the systemic and direct effects. Various laboratory tests are used to identify the potential for primary irritation (in vivo, in vitro, guinea pig sensitization, and lymph node tests).

I think we need to talk about what to include here if you want to talk about the criteria at all. It is a good idea to introduce them because they are the key to the improved skin notations. However, we have to be consistent. If you want to mention specific methods, you have to do that for all three categories. My recommendation is: Revise and modify the other sections and think about any other inclusions (e.g., table and insert box) first, then determine how much coverage you may spare on this discussion. I can then help you write up the appropriate content knowing your space limitation.
Application of improved Skin Notations

The improved skin notations may be applied:

- For identification of industrial chemicals as skin exposure hazards
- For consideration of strategies for chemical exposure controls
- For training and education on health hazards present at the workplace

**Several comments to the overall presentation of information:**

1. The general structure of the brochure is fine. The use of subheadings in some sections is also a good idea as it helps the readers identify the key messages that you want to deliver. However, if you use subheadings to organize and group information of similar nature, to the extent possible you need to make sure that the same information does not repeatedly and sporadically appear in other sections or under different subheadings. This effort will help you save the limited space you have to present other essential information. I also recommend that you start incorporating some editorial features in the subheadings, e.g., font type/size and use of color, in your next draft so your reviewers can have a taste about what it may look like in the final draft.

2. A document with only plain text appeals less to its readers. I urge you to think about using some additional formats of presentation in the brochure. For example, the definition of "systemic toxicity" "irritation" and etc. can be presented as an insert box accompanying their first appearance in the text. If you use an insert box in this case, the terminology for adverse health effects can be explained without interrupting your statements in the main text. You should also consider summarizing your introduction of different assignment criteria in a table; it is clear and easy to compare, and will keep you free from repeating similar information in the same section. There are other formats you may consider to use to make the brochure a more vivid reading, such as drawings or charts. Of course you don’t need to have each of them given the size limitation for the brochure. Nevertheless it will make your later work easier if you consider these options early in the process.
Appendix 7

Skin Notations—Alerting Workers and Employers to Hazardous Skin Exposures

* note: SK-DIR is replaced by SK-SURF

Introduction
Exposing a worker’s skin to hazardous chemicals at work can cause mild to serious health effects. These include surface effects (such as contact dermatitis including skin irritation and corrosion) and systemic effects (adverse effects that affect the body in general rather than in a local manner) and allergic contact dermatitis (skin sensitization). These conditions cost about $1 billion each year. They can result in serious disabilities for workers and even death.

What are skin notations?
Skin notations are indicators of chemical skin exposure hazards. Currently the NIOSH Pocket Guide to Chemical Hazards uses the word “skin” to identify these chemicals.

Why are skin notations used?
Currently skin notations are used to warn workers about the possibility of systemic effects resulting from skin exposure to hazardous chemicals.

Why are skin notations being changed?
Skin notations are being changed to expand their coverage beyond the systemic effects of these chemicals when they are absorbed through skin and enter the bloodstream. The new skin notations provide coverage of surface effects and sensitization to supplement the current coverage of systemic effects. See the table below for descriptions of surface and sensitization effects.

What did skin notations used to be like?
Skin notations used to warn workers about the systemic effects caused by skin absorption of chemicals. (perhaps I should omit this short section—it seems redundant)

Comment: I agree. It can be easily covered by the changes I made earlier.

Comment: Since you changed the "localized" effects to "surface" effects, you need to separately mention sensitization, which is a "localized" effect beyond a "surface" effect according to your definition(s).
What will the new skin notations be like?
The new skin notations will still be listed in the NIOSH Pocket Guide to Chemical Hazards. However, the new skin notations will use the prefix “SK-” followed by a descriptive word (SYS, SURF, SEN) to indicate the type of effect. The word “skin” will no longer be used to identify skin notations in the NIOSH Pocket Guide to Chemical Hazards.

Why are the new skin notations better?
The new skin notations are better than the current notations because they warn workers about specific health effects that may result from skin exposures at the workplace rather than giving a general warning only on systemic effects. In addition, the new notations will be assigned based on scientific criteria that reflect the state-of-the-art knowledge in skin diseases and injuries and provide better protection of workers.

What will the new skin notations be?
The table below presents NIOSH’s new system of skin notations.

<table>
<thead>
<tr>
<th>Skin Notation</th>
<th>Type of Health Threat</th>
<th>Result of Health Threat</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK-SYS</td>
<td>Systemic</td>
<td>Chemical may cause systemic effects if absorbed through skin.</td>
</tr>
<tr>
<td>SK-SURF</td>
<td>Surface effect(s)</td>
<td>Chemical may cause effects on the surface layers of exposed skin; the effects may include irritation, corrosion, and compromise of skin integrity</td>
</tr>
<tr>
<td>SK-SEN</td>
<td>Sensitization</td>
<td>Chemical may cause allergic contact dermatitis (ACD), sensitization of exposed skin, or airway sensitization from skin exposure</td>
</tr>
</tbody>
</table>

Combined Notation Assignment
The new skin notations also include a combined assignment. The combined assignment warns workers about chemicals that may have two or more types of effects from skin exposure.

The notation for multiple hazards is a string of notations after the “SK-” prefix. For example, a SK-SYS-SURF notation means that a chemical may cause both systemic effects and effects on the surface of skin.

Recommended Uses of Skin Notations
We are still deciding whether to include this section and what its contents should be.
Why are skin notations used?

Many readers expected the Pocket Guide to identify (1) acute effects (e.g., rashes) and (2) long-term effects, both in addition to (3) skin-related dermatitis in addition to (4) chronic systemic effects.

Why were skin notations changed?

Skin notations were previously used in the Pocket Guide to inform workers about potential effects. However, skin notations were NOT previously used to inform workers about the possibility of cumulative effects. The Pocket Guide's primary aim is to inform workers about the potential for hazardous chemicals that could cause...
Conclusion

Niosh hazards skin reactions in 7.2.1. what if your reactions are not in this list or your condition is not covered.

exposures to hazardous chemicals. The current skin reactions are better than the old ones because they (1) represent the most recent scientific information about skin exposure or chemical hazards, and (2) provide detailed specific information about skin reactions.

For more information about skin exposure or chemical hazards, visit the NIOSH website at www.cdc.gov/niosh.