

INTRODUCTION

This set of Process Safety Audit Protocols and Checklists helps Process Safety Management (PSM) professionals meet two important goals: auditing against a standard, and checking for potential safety problems.

The protocols and checklists have been divided into four volumes, as explained below.

VOLUME I: AUDITS

Most process facilities in the United States must meet the requirements of two regulations:

1. The *Process Safety Management* standard (29 CFR 1910.119) from the Occupational Safety & Health Administration (OSHA).
2. The *Risk Management Program* from the Environmental Protection Agency (EPA), Title 40 Part 68.

Companies that own or operate process facilities in other nations may also elect to follow the requirements of the United States regulations so as to provide consistency within their operations. Moreover, the regulations are quite general in their scope. Therefore their use makes sense regardless of where a plant is actually located.

The technical requirements of the OSHA standard and the EPA rule are very similar. They were intentionally organized so as to minimize duplication of effort. However, where differences exist, those differences are identified in the Protocols. The differences are mostly to do with covered chemicals and reporting requirements.

The audit protocols in Volume I match the organization of the OSHA and EPA standards. For example, the protocol (c)(2) *Consultation* specifically addresses paragraph (c)(2) of 29 CFR 1910.119. The corresponding EPA paragraphs, which start with the number § 68, are also identified within each protocol.

Once the protocols are completed, a facility should have a clear sense as to whether it meets federal regulations or not.

VOLUMES II – IV: CHECKLISTS

The Checklists in Volumes II — IV provide a non-regulatory framework for managers, operators and engineers to identify potential safety and operating problems. The checklists are based on extensive engineering, operating and technical experience. The checklists can be used in Audits, Process Hazards Analyses, Incident Investigations, Management of Change and Prestartup Safety Reviews.

The checklists are organized according to the OSHA process safety standard, as shown below. The checklists are then organized into three volumes. (Three volumes were needed because the amount of material is large. However the volumes should be regarded as elements of an integrated system).

Volume II — Management Systems

- 1.0 Employee Participation
- 2.0 Process Safety Information
- 4.0 Operating Procedures
- 5.0 Training
- 9.0 Hot Work
- 10.0 Management of Change
- 12.0 Emergency Response & Planning
- 13.0 Compliance Audits
- 14.0 Trade Secrets

Volume III — Risk Analysis

- 3.0 Process Hazards Analysis
- 7.0 Prestartup Safety Review
- 11.0 Incident Investigation

Volume IV — Equipment

- 6.0 Contractors
- 8.0 Mechanical Integrity

The Checklist questions do not have right or wrong answers. Each question is intended to trigger a train of thought and discussion — the final conclusion of such discussions will depend on the circumstances and conditions at each facility, or on each design team. Also, not all the checklist questions will apply to all facilities. If a facility does not use reciprocating compressors, say, then the checklists to do with that type of equipment are not pertinent.

The Audit Protocols of Volume I and the Checklists complement one another. It is recommended that, before using the checklists in a particular area that the audit protocol be completed first.

DESIGN OF THE PROTOCOLS AND CHECKLISTS

The protocols and checklists have a consistent design, although details between them differ slightly. An example of an audit protocol is shown on the next page.

(d)	Process Safety Information		
	Overview		
Rev. Number	1	Revision Date	August 12, 2002
References	paragraph (d) of www.osha-slc.gov/OshStd_data/1910_0119.html para. 68.48 and 65 of http://yosemite.epa.gov/oswer/ceppoweb.nsf/content/RMPS.htm?OpenDocument Process Safety Management. www.suttonbooks.net/books/book_prsm.html		
Company		Location	
Reviewer		Date	
SME		Documents	
Observations		Reports	

Number	Question	√	Notes
(d).1	Was written Process Safety Information compiled before conducting any Process Hazard Analyses (PHA)?		
(d).2	Does the Process Safety Information include information pertaining to the hazards of highly hazardous chemicals used in the process?		
(d).3	Does the Process Safety Information include information pertaining to the hazards of highly hazardous chemicals produced in the process?		
(d).4	Does the Process Safety Information include information pertaining to the technology of the process?		
(d).5	Does the Process Safety Information include information pertaining to the equipment in the process?		

1. The top line shows the major process safety category — in this case Process Safety Information.
2. The second line contains the revision number of that particular protocol (*not* the overall volume). It also shows the date that that revision was released. As the checklists are updated, different checklists in the same Volume will have different revision numbers and release dates. Information on the latest updates can be obtained from www.suttonbooks.net/books/chck-updates.html.
3. The third line lists references that could provide assistance. In this case, the OSHA and EPA regulations are listed, along with the book *Process Safety Management*.
4. The fourth line provides information on the company or facility being reviewed, and where it is located.
5. The next line provides space for the name of the auditor, and the date on which the audit was carried out.
6. The sixth and seventh line provide space for the information sources consulted. Ideally, the auditor will have information in all four boxes. At least one cross-reference should always be provided. For example, a written document should be compared with what an expert says.
 - a. *SME* is the subject matter expert(s) who were interviewed. These typically are operators, supervisors, superintendents and engineers.
 - b. *Documents* refers to the written program information such as the process safety procedures for that facility.
 - c. *Observations* are made by the auditor as he or she carries out the audit. For example, the auditor may note that a subject matter expert seemed unsure of a particular item of information.
 - d. *Reports* are documents that show how a requirement was met. For example, a Process Hazards Analysis report shows how the PHA requirements were met.
7. The next set of lines has four columns. The first two columns provide the question numbers and the questions themselves. In this case, there are five questions. Each has a unique number corresponding to the category under review. Generally, the questions are open ended.
8. The third and fourth columns associated with the questions provide space for a check mark and for notes. The check column — identified with the √ mark — can be completed as follows:

- 'Y' means Yes
- 'N' means No
- 'N/A' means not applicable
- 'P' means partial

The space in the notes column provides a link or cross-reference to the auditor's detailed notes.

The protocols and checklists are never more than two pages long.

EXAMPLE

The table below shows how the above audit protocol could be completed in an actual audit.