

Document ID: HAD-192
Revision ID: 1
Effective Date: 03/31/03

Hazard Assessment Document

Hazard Assessment Document for the Power Burst Facility Miscellaneous Structures



Form 412.14
07/24/2001
Rev. 03

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES		Identifier: HAD-192
		Revision: 1
		Page: 1 of 14
PBF	Hazard Assessment Document	For Additional Info: http://EDMS
		Effective Date: 03/31/03

Change Number: 99486

CONTENTS

ACRONYMS.....	2
1. INTRODUCTION.....	3
2. FACILITY DESCRIPTION.....	3
3. MATERIAL INVENTORY.....	7
3.1 Radiological Materials Inventory.....	7
3.2 Hazardous Materials Inventory.....	7
3.3 Other Hazards.....	7
4. HAZARD ASSESSMENT.....	12
4.1 Radiological Materials.....	12
4.2 Hazardous Materials.....	12
4.3 Other Hazards.....	13
5. CONCLUSIONS—CLASSIFICATION DESIGNATION.....	14
6. REFERENCES.....	14

FIGURES

1. PBF reactor area.....	5
2. PBF control area.....	6

TABLES

1. Building being analyzed.....	4
2. Chemical Inventory for PER-606, -616, -617, -619, -621, -624, -627, -629, -634, -720, -722, -724, -734, -735, -779, and TT.....	8
3. Other hazards for PER-606, -616, -617, -619, -621, -624, -627, -629, -634, -720, -722, -724, -734, -735, -779, and TT.....	11
4. Criteria for hazards not requiring additional safety analysis.....	13

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES	Identifier: HAD-192 Revision: 1 Page: 2 of 14
---	---

ACRONYMS

CFR	Code of Federal Regulations
DOE-ID	Department of Energy Idaho Operations Office
FHL	facility hazards list
HAD	hazard assessment document
INEEL	Idaho National Engineering and Environmental Laboratory
MCP	management control procedure
NRASA	not requiring additional safety analysis
OSHA	Occupational Safety and Health Administration
PBF	Power Burst Facility
PRD	program requirements document
RQ	reportable quantity
TT	Tool Trailer
UST	underground storage tank

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES	Identifier: HAD-192 Revision: 1 Page: 3 of 14
---	---

1. INTRODUCTION

This hazard assessment document (HAD) presents the results of an analysis of potential hazards associated with operations of Power Burst Facility (PBF) Building/Structure Nos. PER-606, PER-616, PER-617, PER-619, PER-621, PER-624, PER-627, PER-629, PER-634, PER-720, PER-722, PER-724, PER-734, PER-735, PER-779, and the Tool Trailer (TT) near PER-625. The objective of this analysis is to determine the facility hazard classification for these buildings and structures. The classification is conducted in accordance with established criteria documented in Management Control Procedure (MCP)-2451, "Safety Analysis for Other than Nuclear Facilities."¹ The facility hazards are listed and screened relative to those not requiring additional safety analysis (NRASA). The resulting hazards are considered in the hazard classification where there are credible process-related, natural phenomena, or fire hazards that can potentially affect the public, workers, and the environment.

It is U.S. Department of Energy Idaho Operations Office (DOE-ID) policy that safety documentation be prepared for any activity with potential hazards of a type that are not routinely accepted by the public and that the level of documentation be commensurate with the activity's complexity and level of hazard. One of the first steps to determine the level of safety documentation is facility hazard classification. The Idaho National Engineering and Environmental Laboratory (INEEL) criteria for determining and assigning hazard classification and determining whether an activity can be considered as NRASA are provided in MCP-2451 and in Appendix A of MCP-2451. The hazard classification criteria are based on hazard classification defined in DOE-ID Order 420.C, "Safety Analysis and Review and Approval Process,"² and DOE-ID Order 420.D, "Requirements and Guidance for Safety Analysis."³

2. FACILITY DESCRIPTION

Table 1 lists the buildings and name designations, while Figures 1 and 2 show their relative locations in the PBF Reactor and Control Areas. This classification analysis does not apply to any facilities or structures not listed in this document. The hazardous materials, radiological materials, and physical hazards in these buildings are considered in the analysis.

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES	Identifier:	HAD-192
	Revision:	1
	Page:	4 of 14

Table 1. Building being analyzed.

Building	Description
PER-606	Instrument Bunker
PER-616	Storage Building
PER-617	Storage Building
PER-619	Control Building
PER-621	Emergency Generator Building
PER-624	Auxiliary Building
PER-627	Gas Storage Area
PER-629	Stack Gas Monitor Building
PER-634	Firewater Pumphouse
PER-720	Cooling Tower
PER-722	Fuel Oil Storage Tank (Underground)
PER-724	Septic Tanks
PER-734	Fire and Domestic Water Storage Tank
PER-735	Seepage Pit
PER-779	Heating Oil Tank (underground storage tank [UST])
TT near PER-625	Tool Trailer

**HAZARD ASSESSMENT DOCUMENT
FOR THE POWER BURST FACILITY
MISCELLANEOUS STRUCTURES**

Identifier: HAD-192
Revision: 1
Page: 6 of 14

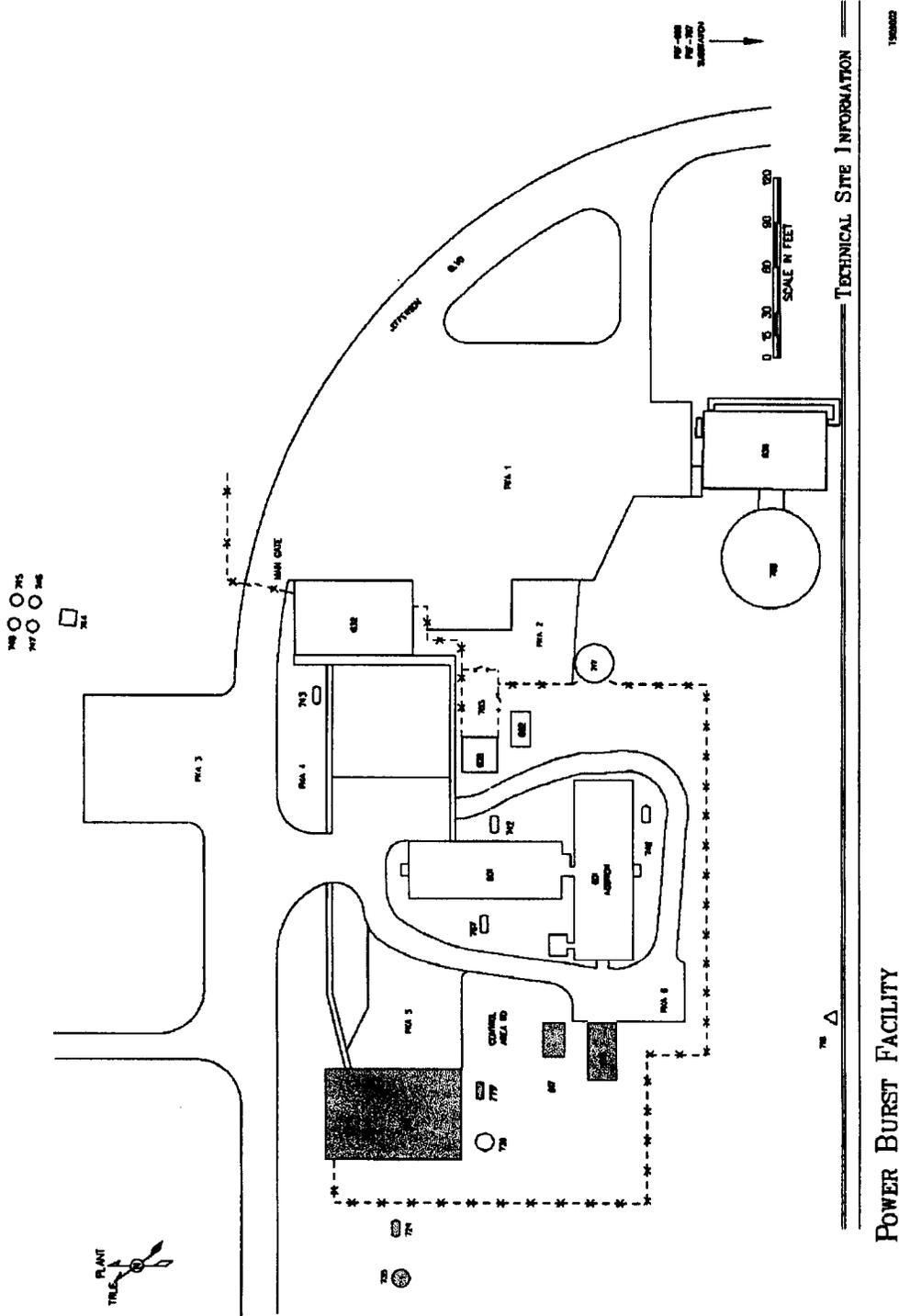


Figure 2. PBF control area.

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES	Identifier: HAD-192 Revision: 1 Page: 7 of 14
---	---

3. MATERIAL INVENTORY

3.1 Radiological Materials Inventory

There is no radiological inventory for the buildings and structures in Table 1.

3.2 Hazardous Materials Inventory

The hazardous chemical material inventories of the buildings and structures in Table 1 are listed in Table 2. For most of these buildings and structures, the listed inventory is a “snapshot in time” for the date when the survey was performed, but the inventories are representative and sufficient to show that Reportable Quantity (RQ) limits from Title 40 Code of Federal Regulations (CFR) Part 302.4, “Designation of Hazardous Substances,”⁴ will not be exceeded. The fuel oil storage tanks, PER-779 and PER-722, and the reactor control building, PER-619, are the only buildings or structures that have a material listed in 40 CFR 302.4. Paragraph (a)(ii)(A) of Occupational Safety and Health Administration (OSHA) document 29 CFR 1910.119, “Process Safety Management of Highly Hazardous Chemicals,”⁵ specifically excludes hydrocarbon fuels used solely for comfort heating. Therefore, No. 2 fuel oil and propane are not included in the hazardous chemical inventory.

3.3 Other Hazards

PRD-5042, “Facility Hazard Identification,” provides the requirements for the identification and documentation of safety and health hazards inherent to fixed facility equipment, structures, and processes with respect to a hazard’s specific location. These hazards have been placed into a web-based facility hazard list (FHL) database accessible by the INEEL population. Table 3 contains the FHL data for each building or structure in Table 1.

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES	Identifier: HAD-192 Revision: 1 Page: 8 of 14
---	---

Table 2. Chemical inventory for PER-606, -616, -617, -619, -621, -624, -627, -629, -634, -720, -722, -724, -734, -735

Bldg	Name	Product Name	Material	CAS No.	MSDS No.	Percent (material in product)	Qty (Kg)
PER-606	Instrument Bunker	None	None	None	None	None	
PER-616	Storage Building	None	None	None	None	None	
PER-617	Storage Building	None	None	None	None	None	
PER-619	Control Building	SDA 3A Anhydrous 200 Proof; Specialty SDA 3A Anhydrous 200 Proof; Denatured Alcohol; Ethyl Alcohol	Ethyl Alcohol	64-17-5	8413	95.2	0.09
PER-619	Control Building	SDA 3A Anhydrous 200 Proof; SDA 3A Anhydrous 200 Proof; Denatured Alcohol; Ethyl Alcohol	Methyl Alcohol	67-56-1	8413	4.8	0.00
PER-619	Control Building	EFDC-50 Green Capillary Ink	Ethylene Glycol	107-21-1	11312	15	0.28
PER-619	Control Building	Stride - Floral	Water, Alkylphenoxy Polyethoxyethanol, Sodium Xylene Sulfonate		12	100	
PER-619	Control Building	Easy Paks Neutralizer Conditioner/ Odor Counteractant	Citric Acid, Sodium Carbonate		2496	100	
PER-619	Control Building	WD-40 Aerosol (A-70 Hydrocarbon Propellant) - Covers P/N Beginning With 4	Aliphatic Petroleum Distillates, A-70 Hydrocarbon Propellant, Petroleum-Base Oil	8052-41-3	4715		
PER-619	Control Building	Air Flow Indicator Tubes; Smoke Tubes; Stannic Chloride	Stannic Chloride	7646-78-8	16478	100	
PER-619	Control Building	Silver Bars	Silver	7440-22-4	17287	100	102.15
PER-621	Emergency Generator Building	HD5 Propane; Odorized Propane; C3 Propane	Butane, Ethane, Ethyl Mercaptan, Isobutane, Propane, Propylene		19170		

**HAZARD ASSESSMENT DOCUMENT
FOR THE POWER BURST FACILITY
MISCELLANEOUS STRUCTURES**

Identifier: HAD-192
Revision: 1
Page: 9 of 14

Table 2. (continued).

Bldg	Name	Product Name	Material	CAS No.	MSDS No.	Percent (material in product)	Qty (Kg)
PER-624	Auxiliary Building	None	None	None	None	None	
PER-627	Gas Storage Area	Nitrogen, Compressed	Nitrogen		8864	100	
PER-627	Gas Storage Area	Commercial Propane; Liquefied Petroleum Gas; LP-Gas; LPG	Propane, Ethane, Propylene, Ethyl Mercaptan, N-Butane		11464	100	
PER-627	Gas Storage Area	P-10; Argon 90% Methane 10%	Argon, Methane		7064	100	
PER-629	Stack Gas Monitor Building	None	None	None	None	None	
PER-634	Firewater Pumphouse	None	None	None	None	None	
PER-720	Cooling Tower	None	None	None	None	None	
PER-722	Fuel Oil Storage Tank (UST)	LS Diesel 2; Calco LS Diesel 2; Diesel Fuel Oil; Gas Oil; HS Diesel 2; HS Heating Fuel 2; LS Diesel 2; LS Heating Fuel 2; Marine Diesel; RR Diesel Fuel	Diesel Fuel No. 2	68476-34-6	16,450	100	21,005.16
PER-724	Septic Tanks	None	None	None	None	None	
PER-734	Fire and Domestic Water Storage Tank	None	None	None	None	None	

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES	Identifier: HAD-192 Revision: 1 Page: 10 of 14
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Table 2. (continued).

Bldg	Name	Product Name	Material	CAS No.	MSDS No.	Percent (material in product)	Qty (Kg)
PER-735	Seepage Pit	None	None	None	None	None	
PER-779	Heating Oil Tank, UST	Diesel Fuel No. 2	Diesel Fuel No. 2		9961	100	5,860.36
TT	Tool Trailer	None	None	None	None	None	

* Excluded by 29 CFR 1910.119 (heating fuel).

CAS Chemical Abstract Service Registry
MSDS material safety data sheets
NA not applicable
UST underground storage tank

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES	Identifier: HAD-192 Revision: 1 Page: 11 of 14
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Table 3. Other hazards for PER-606, -616, -617, -619, -621, -624, -627, -629, -634, -720, -722, -724,-734, -735, -779, and TT.

Bldg	Name	Hazards from the Facility Hazard List
PER-606	Instrument Bunker	Falling Hazard, Ladder/Roof Access
PER-616	Storage Building	1/2-Ton Chain Hoist
PER-617	Storage Building	Flammables
PER-619	Control Building	Confined Space – PER-619-TK-001
PER-619	Control Building	Trip-Fall – platform
PER-619	Control Building	Electrical Distribution Equipment – 480 Vac
PER-619	Control Building	Trip/fall – ladder
PER-619	Control Building	Plastic Shear and Engraver
PER-619	Control Building	Halon Fire Suppression System
PER-619	Control Building	Water Heater
PER-619	Control Building	Oil Furnace
PER-621	Emergency Generator Building	Hot Surfaces on HP Generator
PER-621	Emergency Generator Building	Gasoline Lines
PER-621	Emergency Generator Building	Compressed Gas – propane lines
PER-621	Emergency Generator Building	Flammable – propane tank
PER-624	Auxiliary Building	Electrical Distribution Equipment – 480 Vac load center
PER-624	Auxiliary Building	Electrical Distribution Equipment – 480 Vac conduit
PER-624	Auxiliary Building	Electrical Distribution Equipment – 480 Vac Transformer
PER-624	Auxiliary Building	Compressed Gas – cylinder nitrogen
PER-624	Auxiliary Building	Confined Space PER-624-MH-001 (pit with hatch covers in front of PER-624)
PER-627	Gas Storage Area	Compressed Gas – cylinders
PER-627	Gas Storage Area	Asbestos
PER-629	Stack Gas Monitor Building	Tripping Hazards
PER-629	Stack Gas Monitor Building	Low Overhead Hazard
PER-634	Firewater Pumphouse	Electrical Distribution Equipment – 480 Vac, conduit
PER-634	Firewater Pumphouse	480 Vac, motor
PER-634	Firewater Pumphouse	Transformers
PER-634	Firewater Pumphouse	Flooding Hazard
PER-720	Cooling Tower	Asbestos
PER-720	Cooling Tower	Trip/Fall – Cooling Tower
PER-720	Cooling Tower	Wood Structure Components
PER-720	Cooling Tower	Falling Through – stairs/work platforms

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES	Identifier: HAD-192 Revision: 1 Page: 12 of 14
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Table 3. (continued).

Bldg	Name	Hazards from the Facility Hazard List
PER-722	Fuel oil Storage Tank (Under ground)	None
PER-724	Septic Tanks	Confined Space PBF-619-TK-001
PER-734	Fire and Domestic Water Storage Tank	Trip/Fall – ladder
PER-734	Fire and Domestic Water Storage Tank	Trip/Fall – top of equipment/tanks
PER-734	Fire and Domestic Water Storage Tank	Confined Space PBF-734-TK-001
PER-735	Seepage Pit	Confined Space – tanks
PER-735	Seepage Pit	Seepage Tank Integrity
PER-779	Heating Oil Tank, UST	None
TT	Tool Trailer near PER-625	None

4. HAZARD ASSESSMENT

Hazard identification and screening identifies the hazards in the facility. After the hazards are identified, those that are not clearly addressed by DOE-required occupational safety and health programs are used to determine the hazard classification of the facility.

The hazard identification methods include use of a facility hazard list. The facility hazard list was developed in accordance with PRD-5042 and identifies the hazards associated with buildings. There are potentially chemical, radiological, and physical hazards associated with these buildings. These hazards are screened against hazard classification criteria based on building inventory and natural phenomena impact, as discussed in the following sections. The radiological hazards (there are none) are discussed in Section 3.1. The building chemical inventory hazards relative to hazard classification are discussed separately, in Section 3.2. The other industrial hazards are discussed in Section 3.3.

4.1 Radiological Materials

The buildings and structures listed in Table 1 have no radioactive materials. This means that the inventory is the below NRASA threshold.

4.2 Hazardous Materials

The hazardous chemical materials inventory for the buildings and structures listed in Table 1 is below the NRASA threshold.

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES	Identifier: HAD-192
	Revision: 1
	Page: 13 of 14

4.3 Other Hazards

The INEEL criteria for determining and assigning hazard classification and determining whether an activity can be considered as NRASA are provided in MCP-2451 and in Appendix A of MCP-2451. Table 4 lists the criteria and the INEEL controls typically applicable to the hazards. The hazards listed in Table 3 are compared to the requirements in Table 4. None of the buildings or structures listed in Table 4 contain hazards that exceed the NRASA criteria listed in Table 4.

Table 4. Criteria for hazards not requiring additional safety analysis.

Hazard Types	
1. Radioactive material	Radioactive material at risk quantity is below the 40 CFR 302, Table 302.4, Appendix B reportable quantity (RQ) limits.
2. Chemical hazards (spills)	Chemical material at risk quantity below the RQ limits in Table 302.4 of 40 CFR 302.
3. Standard industrial hazards	Hazards that are controlled in compliance with applicable OSHA regulations and are not initiators for nuclear accidents for the following items: Walking and working surfaces, noise, lifting equipment, welding, and general housekeeping. (See additional industrial criteria associated with hazard Types 6, 7, 8, 10, 11, and 14.)
4. Nuclear criticality hazard	Fissionable material less than 15 g.
5. Field and low-level fixed x-ray equipment	X-ray equipment (field and low-level x-ray).
6. Toxic materials (releases)	Potential air concentrations of toxic materials from an accident release are less than 5 times the RQ values of 40 CFR 302 Table 302.4.
7. Flammable materials	Flammable materials where the inventory of flammable materials is not more than allowed by identified National Fire Protection Association code for the building occupancy classification.
8. Explosive materials	Explosive materials where the inventory is not more than allowed by the applicable Uniform Fire Code for the building occupancy classification, or as established in writing between operations line management and the INEEL Explosives Safety Committee, or by DOE Manual 440.1.1.
9. Lasers	Lasers which are not Class III (without an enclosed beam) or Class IV.
10. Electrical	Electrical sources are not more than 600 V or if more than 600 V, not more than 25 mA and not more than 50 J stored energy.
11. Kinetic energy	Machinery with no unusual or unique high-kinetic energy systems.
12. Pressure	Pressured systems that are not more than 3,000 psig.
13. High temperature	High temperature incapable of environmental interaction causing strong overpressure, toxic products, or initiating a release of toxic or radiological materials.
14. Biohazards	Biohazards with no special industrial hygiene controls required (based on review by the Institutional Biosafety Committee).
Table References:	
29 CFR 1910, "Occupational Safety and Health Standards."	
40 CFR 302, "Designation, Reportable Quantities, and Notification."	
DOE Manual 440.1.1, "DOE Explosives Safety Manual."	

HAZARD ASSESSMENT DOCUMENT FOR THE POWER BURST FACILITY MISCELLANEOUS STRUCTURES	Identifier: HAD-192 Revision: 1 Page: 14 of 14
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5. CONCLUSIONS—CLASSIFICATION DESIGNATION

A building/facility is classified as NRASA if: (1) the building/facility has no hazards or only NRASA hazards, (2) does not have a combination of NRASA hazards that would warrant additional safety analysis, and (3) has only NRASA hazards with controls such that no additional analysis beyond what is required for each individual NRASA hazard is needed to integrate the controls or to resolve conflicts between controls for separate NRASA hazards. Material inventory must be below the 40 CFR 302 RQ limits.

The hazard classification for the buildings listed in Table 1 is NRASA, based on material inventory and other hazards discussed in Section 3. The PBF buildings and structures listed in Table 1 were compared to the DOE and INEEL criteria to determine the hazard classification for the buildings and structures. The hazard classification made in Section 4 concluded that the hazards presented by the operations of the buildings and structures in Table 1 are NRASA for all buildings and structures.

6. REFERENCES

1. MCP-2451, "Safety Analysis for Other than Nuclear Facilities," Current revision.
2. DOE-ID Order 420.C, "Safety Analysis and Review and Approval Process," Rev. 0, U.S. Department of Energy Idaho Operations Office, July 17, 2000.
3. DOE-ID Order 420.D, "Requirements and Guidance for Safety Analysis," Rev. 0, U.S. Department of Energy Idaho Operations Office, July 17, 2000.
4. 40 CFR 302.4, "Designation of Hazardous Substances," *Code of Federal Regulations*, Office of the Federal Register, September 9, 2002.
5. 29 CFR 1910.119, "Process Safety Management of Highly Hazardous Chemicals," *Code of Federal Regulations*, Office of the Federal Register, November 7, 2002.