

Standards, Level 1 - Company Wide

CPCC-STD-SH-54923

Carcinogen Control Standard

Revision 0, Change 0

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Periodic Review Due Date:

Program: Occupational Safety and Industrial Hygiene

Topic: Occupational Safety and Industrial Health

Technical Authority: Linklater, Carson K

Functional Manager: Foster, Andrew L

Use Type: Administrative



USQ Facility	USQ Review	Screeener
Solid Waste Operations Complex	(Screening/Determination Performed (no issues)) <i>SWOC-23-027S</i>	Masulonis, John
Canister Storage Building/Interim Storage Area	(Screening/Determination Performed (no issues)) <i>CSB-23-016</i>	Garrett, Robert
Central Plateau Surveillance and Maintenance	Exclusion Reason: <i>N/A per Section 1.3; NS-062 does not apply to activities that are not subject to the requirements of 10 CFR 830.</i>	
Waste Encapsulation Storage Facility	(Screening/Determination Performed (no issues)) <i>WESF-23-029</i>	Garrett, Robert
Plutonium Finishing Plant	Exclusion Reason: <i>N/A per Section 1.3; NS-062 does not apply to activities that are not subject to the requirements of 10 CFR 830.</i>	
Transportation	Exclusion Reason: <i>N/A per Section 1.3</i>	
Capsule Storage Area	Exclusion Reason: <i>Per B-11</i>	
105 KW Facility	(Screening/Determination Performed (no issues)) <i>0046-2023</i>	Oberg, Brian
324 Building	(Screening/Determination Performed (no issues)) <i>324-23-032</i>	Garrett, Robert

JHA: Administrative

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Change Summary

Description of Change

The CPCC-STD-SH-54923, Carcinogen Control Standard, is a stand-alone document that provides direction and the regulatory basis for controlling worker exposure to human carcinogens. Carcinogen control was previously addressed in CPCC-PRO-SH-17916, Industrial Hygiene Exposure Assessments.

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1.0 INTRODUCTION

1.1 Purpose

This standard provides guidance for meeting requirements for handling chemicals that pose a potential carcinogenic hazard. This standard establishes the minimum requirements and guidance for the purchase, use, storage, and handling of the Occupational Safety and Health Administration (OSHA)-regulated carcinogens, OSHA-specific carcinogens, and known human and suspect human carcinogens.

1.2 Scope

This standard applies to "chemicals" as defined in CPCC-PRO-SH-40516, *Chemical Management Program*, and does not apply to wastes. An "occupational carcinogen" is defined as any chemical used in the workplace that contains a concentration of 0.1% or more of a known or potential human carcinogen. These definitions are consistent with the definitions of "carcinogen" contained in CPCC-PRO-SH-40410, *Hazard Communication Program*.

Consumer products (chemicals) used in facilities or operations at CPCCo are outside the scope of this standard if they:

- Contain non-OSHA-regulated occupational carcinogens
- Are used in a manner similar to that of normal consumer use, and
- Result in a duration and frequency of exposure similar to that which consumers experience.

Consumer products are not exempt from this standard if they contain "OSHA-regulated carcinogens" and/or "OSHA-specific carcinogens", unless the applicable OSHA standard specifically permits such an exemption.

OSHA-regulated carcinogens are those carcinogens regulated by 29 CFR 1910.1003. OSHA-specific carcinogens are those that have substance-specific regulations in 29 CFR 1910.1017 through 1910.1052 and 29 CFR 1926.1117 through 1926.1152. Appendix A contains lists of OSHA-regulated and OSHA-specific carcinogens, along with the specific *Code of Federal Regulations* (CFR) reference.

Control of occupational exposure to beryllium reagents and/or beryllium-containing chemicals/chemical products is within the scope of this standard. However, work involving beryllium contamination is outside the scope of this standard and is covered by DOE-0342, *Hanford Site Chronic Beryllium Disease Prevention Program (CBDPP)*.

In general, control of occupational exposure to asbestos is outside the scope of this standard in accordance with CPCC-STD-SH-52894, *Asbestos Control*. Proposed materials containing asbestos or asbestiform products are evaluated by Occupational Safety & Industrial Hygiene (OS&IH) for potential exposures during usage and to evaluate safer substitutes.

Control of occupational exposure to lead and other toxic metals is outside the scope of this standard (see CPCC-PRO-SH-40498, *Toxic Metals Exposure Control*).

Control of exposure to ionizing radiation is also outside the scope of this standard.

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This standard applies to CPCCo personnel and subcontractors who may use or be exposed to carcinogens.

1.4 Implementation

This standard is effective upon publication.

2.0 STANDARD**2.1 Product Evaluation**

Prior to procurement, a CPCCo industrial hygienist (IH) evaluates products that pose a potential carcinogenic hazard in accordance with CPCC-PRO-SH-40516. Should the IH discover that the product contains a carcinogen, the IH may consult with the Carcinogen Control Technical Authority (TA). The IH evaluates the material and:

- Assists the Facility Chemical Custodian (FCC) in completing a Chemical Product Screening (CPS) form with input from the TA as needed. The CPS form initiates a hazard assessment if the product has ingredient(s) listed as a carcinogen (as defined in Appendix B) in concentrations $\geq 0.1\%$.
- Determines whether practical substitutes can effectively replace the proposed material. The evaluation considers the application as it relates to exposure potential.
- Determines if, based on usage quantities and activities, product-specific operating procedures for safe use and disposal of the material are required for this material. (As required, these procedures include emergency procedures should a spill or a major release occur.)
- Ensures training is provided for carcinogens listed in Table 1 and Table 2 of Appendix A, in addition to other carcinogens regulated by OSHA, including asbestos.
- Provides technical assistance to ensure applicable regulatory requirements (e.g., signage, training) for the carcinogenic material are implemented.
- Provides recommendation for approval or disapproval for carcinogenic material procurement if no suitable substitute is available.

2.2 Hazard Assessment

In accordance with 10 CFR 851, *Worker Safety and Health Program*, and CPC-PRO-SH-40410, a written hazard assessment is required by the IH prior to use of chemical(s) that pose a carcinogen exposure hazard. The hazard may be documented through an Industrial Hygiene Exposure Assessment (IHEA), a CPS form, an industrial hygiene hazard screening (IHHS) form, or other means.

The hazard assessment documents the following:

- Product name and description how the product is used and/or applied

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- NOTE:**
- *In most cases the location is a building and room number. It is acceptable, however, to have a larger location, if the description of product use is the same, the potential for exposure is similar, and potentially exposed employee groups are identified.*
 - *The FCC can assist in determining the total quantity of chemical maintained at the location, and can verify that the quantity matches the quantity documented in the Chemical Inventory Tracking System (CITS).*

- Location where product is expected to be used
- Total quantity normally maintained at the location--should align with what is listed in CITS
- Hanford Safety Data Sheet/Material Safety Data Sheet (SDS/MSDS) numbers
- Carcinogenic component(s) and estimated percentage quantity
- Chemical Abstracts Service (CAS) number(s) of the carcinogenic component(s)
- Carcinogen designation(s) and identifier (e.g., chemical name or CAS number) if the product contains multiple carcinogenic components
- Available, practical substitutes and/or an explanation why a substitute will not be used

2.3 Exposure Assessment Review

An exposure assessment review provides supporting information to an IHEA regarding potential or past exposures to the chemical/carcinogen. To facilitate this review, the IH documents the following:

- NOTE:**
- *Appendix A lists the OSHA-regulated carcinogens and the OSHA-specific carcinogens.*
 - *The exposure potential description can be preliminary in nature, since it is determined prior to chemical acquisition.*

- Qualitative description of the exposure potential to the carcinogen(s), including the following:
 - Frequency of exposure
 - Peak exposure
 - Normal exposure
 - Number of people normally exposed during normal usage
 - Exposure during upset conditions
 - Number of people potentially exposed during upset conditions
 - Likelihood of upset conditions occurring
- Chemical specific regulatory requirements that are not contained in CPCCo procedures, examples include:
 - Permissible exposure limit (PEL)
 - Monitoring
 - Creation of a regulated area
 - Personal protective equipment (PPE)
 - Chemical specific training
 - Signage
 - Medical monitoring

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- Summary of exposure monitoring results, including the following if available:
 - Data from use of the product for the same use
 - Data from use of the product for other uses
 - Data from use of other products with similar components

2.4 Hazard Communication and Medical Surveillance Review

A hazard communication and medical surveillance review is needed to review/revise training and the Employee Job Task Analysis (EJTA) that supports the employee training requirements contained in CPCC-PRO-SH-40410, as well as the requirements of CPCC-PRO-SH-52755, *Employee Job Task Analysis*. Training may be covered in Hanford General Employee Training (HGET), Facility Emergency Hazard Identification Checklist (FEHIC), Hazardous Waste Operations and Emergency Response (HAZWOPER), pre-job briefings, the IHEA, or other means.

From this review, the IH determines the following:

- Whether or not potentially exposed employees have been trained in the hazards of the product in accordance with CPCC-PRO-SH-40410 or if an explanation why employee is not trained is provided (e.g., handling low hazard printer cartridges that contain carbon black)
- Whether the EJTA's for potentially exposed employees have been updated to designate potential exposure to the carcinogen(s)

2.5 Regulated Area

A regulated area must be established in the following circumstances:

- Where each OSHA-regulated carcinogen is used regardless of exposure level, and
- Where the use of an OSHA-specific carcinogen results in exposures greater than the PEL, short-term exposure limit (STEL), or excursion limit (see Appendix A).

The manager responsible for carcinogenic material usage reviews the IH exposure potential determination and establishes a regulated area based on potential exposure or monitoring results. The manager ensures that authorized personnel working in a regulated area established for carcinogen exposures:

- Have a baseline medical exam, with specific notation for that OSHA-regulated or OSHA-specific carcinogen
- Be placed on a medical surveillance program specific for each OSHA-regulated or OSHA-specific carcinogen

All entrances to regulated work areas are posted with the appropriate sign (similar to the example in Figure 1) in accordance with CPCC-PRO-SH-40445, *Tags, Signs & Barriers*. OSHA-approved signs are available at the Sign Shop or can be purchased commercially. The sign shop adds the name of the carcinogen in the product. Refer to the individual reference (e.g., 29 CFR 1910.1018, Inorganic Arsenic) for signage requirements for OSHA-Specific carcinogens listed in Table 2.

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Figure 1. Example of Appropriate Signage



2.6 Labels

A carcinogen label is placed on all carcinogenic material containers as determined by the IH to pose a potential exposure hazard, unless the material contains a Globally Harmonized System (GHS)-HAZCOM label. The GHS classification and labeling of chemicals requires the use of pictograms and may designate products with either the word “Danger” or “Warning” noted on the SDS and/or label.

2.7 Hygiene

Employees must wash hands after using or handling carcinogens or potential carcinogens. Eating, drinking, chewing, smoking/chewing tobacco, and storing food utensils is prohibited in work areas where carcinogens are being used or stored. Refer to the individual reference (e.g., 29 CFR 1910.1027, Cadmium) for hygiene requirements for OSHA-Specific carcinogens listed in Table 2.

2.8 Related Documents

Information that supports exposure assessment requirements may be found in other CPCCo procedures. Prior to the use of a chemical/carcinogen, the following documents should be reviewed:

- CPCC-PRO-SH-17916, *Industrial Hygiene Exposure Assessments*
- CPCC-PRO-WKM-12115, *Work Management*, which contains work planning requirements
- Applicable IHEA(s) for the specific product and usage
- Applicable safe use procedure(s) (e.g., work instruction, maintenance procedure, or other technical work document)

NOTE:

- *The Waste Management Representative can assist in identifying appropriate disposal pathway for the product.*
- *The Emergency Preparedness Representative can assist in identifying applicable emergency release procedures.*

- Applicable disposal procedure(s)
- Applicable emergency release procedure(s)

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3.0 FORMS

None

4.0 RECORD IDENTIFICATION

None

5.0 SOURCES**5.1 Requirements**

10 CFR 851, *Worker Safety and Health Program*

29 CFR 1910 and 1926, Subpart Z, *Toxic and Hazardous Substances* (various sections --see Appendix A)

29 CFR 1910.1200, *Hazard Communication*

29 CFR 1926, Subpart D, *Occupational Health and Environmental Control*

American Conference of Governmental Industrial Hygienists (ACGIH), TLVs and BEIs: *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices* (2016)

5.2 References

CPCC-PRO-SH-17916, *Industrial Hygiene Exposure Assessments*

CPCC-PRO-SH-40410, *Hazard Communication Program*

CPCC-PRO-SH-40498, *Toxic Metals Exposure Control*

CPCC-PRO-SH-40516, *Chemical Management Program*

CPCC-PRO-SH-52755, *Employee Job Task Analysis*

CPCC-PRO-WKM-12115, *Work Management*

CPCC-STD-SH-52894, *Asbestos Controls*

DOE-0342, *Hanford Site Chronic Beryllium Disease Prevention Program (CBDPP)*

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Appendix A - OSHA Carcinogens Lists

OSHA-regulated carcinogens are the 13 carcinogens that meet the criteria set forth in 29 CFR 1910.1003 – 1016.

Table 1. OSHA-Regulated Carcinogens

	OSHA Regulated Carcinogen	CAS Number	Reference
1	4-Nitrobiphenyl	92-93-3	29 CFR 1910.1003
2	alpha-Naphthylamine	134-32-7	29 CFR 1910.1004
3	methyl chloromethyl ether	107-30-2	29 CFR 1910.1006
4	3,3'-Dichlorobenzidine (and its salts)	91-94-1	29 CFR 1910.1007
5	bis-Chloromethyl ether	542-88-1	29 CFR 1910.1008
6	beta-Naphthylamine	91-59-8	29 CFR 1910.1009
7	Benzidine	92-87-5	29 CFR 1910.1010
8	4-Aminodiphenyl	92-67-1	29 CFR 1910.1011
9	Ethyleneimine	151-56-4	29 CFR 1910.1012
10	beta-Propiolactone	57-57-8	29 CFR 1910.1013
11	2-Acetylaminofluorene	53-96-3	29 CFR 1910.1014
12	4-Dimethylaminoazo-benzene	60-11-7	29 CFR 1910.1015
13	N-Nitrosodimethylamine	62-75-9	29 CFR 1910.1016

OSHA-specific carcinogens require the establishment of a regulated area when employee exposure to airborne concentration may exceed the permissible exposure level, excursion limit, or STEL as stated in 29 CFR 1910, Subpart Z, "Toxic and Hazardous Substances."

Table 2. OSHA-Specific Carcinogens

	OSHA Specific Carcinogen	CAS Number	Reference
1	Vinyl chloride	75-01-4	29 CFR 1910.1017
2	Inorganic arsenic	Varies by compound	29 CFR 1910.1018
3	Chromium (VI)	Varies by compound	29 CFR 1910.1026
4	Cadmium	Varies by compound	29 CFR 1910.1027
5	Benzene	71-43-2	29 CFR 1910.1028
6	1, 2-Dibromo-3-chloropropane	96-12-8	29 CFR 1910.1044
7	Acrylonitrile	107-13-1	29 CFR 1910.1045
8	Ethylene oxide	75-21-8	29 CFR 1910.1047
9	Formaldehyde	50-00-1	29 CFR 1910.1048
10	4,4'-Methylenedianiline	101-77-9	29 CFR 1910.1050
11	1, 3-Butadiene	106-99-0	29 CFR 1910.1051
12	Methylene Chloride	75-09-2	29 CFR 1910.1052

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Appendix B - Definitions

Action level. Fifty percent of the Permissible Exposure Limit or the Threshold Limit Value, whichever is most restrictive. The action level is established to ensure an adequate margin of safety, and is used by the Industrial Hygienist and/or Carcinogen TA in determining the necessity for specific engineering, work practices, and personal protective equipment controls, to reduce employee exposure.

Authorized personnel. Any person whose duties require entering a regulated area and have been trained according to risk of exposure.

Carcinogen. A carcinogen is a substance that causes cancer or is believed to cause cancer. A chemical is considered to be a carcinogen if any one of the following conditions exists:

- It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a Group 1, Group 2A, or Group 2B carcinogen; or
- It is listed in the National Toxicology Program's (NTP) "Annual Report on Carcinogens" (most recent edition) in the "Agents, Substances, Mixtures or Exposure Circumstances Known to be Human Carcinogens" listing or in the "Agents, Substances, Mixtures or Exposure Circumstances Reasonably Anticipated to be Human Carcinogens" listing; or
- It is regulated by Occupational Safety and Health Act (OSHA) as a carcinogen in 29 CFR 1910.1003, Subpart Z or 29 CFR 1926, Subpart Z; or
- It is classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as Group A1 (confirmed human carcinogen) or Group A2 (suspected human carcinogen) carcinogen.

Assume mixtures present a carcinogenic hazard if they contain at least 0.1 percent by weight or volume of a carcinogen.

Excursion limit. Excursion limits apply to those chemicals that do not have an established 15-minute STEL or ceiling limit. Excursions in worker exposure levels may exceed three times the threshold limit value –time weighted average (TLV-TWA) for no more than a total of 30 minutes during a workday, and under no circumstances should they exceed 5 times the TLV-TWA, provided the TLV-TWA is not exceeded.

Occupational exposure limit (OEL). A term used to represent: (1) the concentration or intensity of an airborne agent that is allowable, (2) the time period that workplace concentrations are averaged to compare with the allowable exposure, and (3) the allowable concentration of a biological exposure index (BEI) in a biological sample. Thus, each OEL consists of an exposure limit and an averaging time that are set by the sponsor of the OEL and must be used together, as prescribed by the U.S. Department of Energy (DOE). A substance may have several OELs for short-term or acute exposures (e.g., 15-minute STEL or 30-minute Excursion Limit), long-term or chronic exposures (e.g., 8-hour TWA), or not-to-exceed limits (Ceiling Limit).

The most restrictive OELs have been selected for use from DOE regulated limits (e.g., OSHA PELs, ACGIH TLVs, DOE-regulated limit or, in absence of a DOE regulation, through a collaborative process of industrial hygienists, workers, and toxicologists.)

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Appendix B - (Cont.)

OSHA-regulated carcinogens. Carcinogens that meet the criteria as stated in 29 CFR 1910.1003-1016 (see Appendix A, Table 1).

OSHA-specific carcinogens. Carcinogens that require the establishment of a regulated area when employee exposure to airborne concentration may exceed the permissible exposure level, excursion limit, or STEL as stated in 29 CFR 1910, Subpart Z (see Appendix A, Table 2).

Regulated area. A designated area, in which area entry and exit are restricted and controlled because of the use of carcinogens.