Standards BoosterPak™ for Management of Hazardous Waste in Health Care Facilities
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A. Description of Standard and Implementation Expectations

Section A1: Standard Rationale, Elements of Performance (EPs), Scoring Categories, Implementation Suggestions, and Tips

Program: Hospital
Chapter: Environment of Care (EC)
Standard Number: EC.01.01.01

Standard Text: The hospital plans activities to minimize risks in the environment of care. Note: One or more persons can be assigned to manage risks associated with the management plans described in this standard.

Rationale: Risks are inherent in the environment because of the types of care provided and the equipment and materials that are necessary to provide that care. The best way to manage these risks is through a systematic approach that involves the proactive evaluation of the harm that could occur. By identifying one or more individuals to coordinate and manage risk assessment and reduction activities—and to intervene when conditions immediately threaten life and health—organizations can be more confident that they have minimized the potential for harm.

Risks in the environment include safety and security for people, equipment, and other material; the handling of hazardous materials and waste; the potential for fire; the use of medical equipment; and utility systems. High-level written management plans help the hospital manage risks. These plans are not the same as operational plans, but they do provide a framework for managing the environment of care. These plans should also address the scope and objectives of risk assessment and management, describe the responsibilities of individuals or groups, and give time frames for specific activities identified in the plan. Note: It is not necessary to have a separate plan for each of the areas identified in the standard; the plans may all be contained in a single document.

Element of Performance:
5. Hazardous materials and waste.

Scoring Categories:
Criticality level: Indirect
Documentation required: Yes
Scoring category (A or C): A
Measure of Success: No

Inclusion Suggestions: Describe the objectives and scope of the hazardous materials and waste program by including its limitations, who in the facility has the responsibility of the program, how the materials and waste are managed, how staff is educated in order to comply with applicable local, state, and federal regulations; including investigative procedures for exposures and emergency procedures for spills and exposures. The plan need only provide the process; not the operational requirements of the program.

Descriptions of the performance activity should include meaningful data collection processes that can be used to improve the efficacy of the hazardous materials and waste program. Performance measures and outcomes should be prioritized based on risk levels specific to the organization.

The effectiveness of the program is determined by evaluating the performance measures against the objectives and scope. See also the Standards BoosterPak™ for Environment of Care (EC.04.01.01, EC.04.01.03, EC.04.01.05).
Program: Hospital
Chapter: Environment of Care (EC)
Standard Number: EC.02.01.01
Rationale: Safety and security risks are present in most health care environments. These risks affect all individuals in the facility—patients, visitors, and those who work in the hospital. It is important to identify these risks in advance so that the hospital can prevent or effectively respond to incidents. In some facilities, safety and security are treated as a single function, although in others they are treated as separate functions.

Safety risks may arise from the structure of the physical environment, from the performance of everyday tasks, or from situations beyond the hospital’s control, such as the weather. Safety incidents are most often accidental. On the other hand, security incidents are often intentional. Security protects individuals and property against harm or loss. Examples of security risks include workplace violence, theft, infant abduction, and unrestricted access to medications. Security incidents are caused by individuals from either outside or inside the hospital.

Element of Performance:
5. The hospital maintains all grounds and equipment.

Scoring Categories:
Criticality level: Indirect
Documentation required: No
Scoring category (A or C): C
Measure of Success: Yes

Implementation Suggestions:
If unprotected, hospital grounds and equipment can be sources of harm to staff and patients. The following areas are of particular significance to hazardous materials and waste:

Hazardous Materials Storage: If hazardous materials are stored outdoors, they should be stored in designated areas that are secured such that the public or patients cannot easily come into contact with these materials. The storage areas should have adequate containment for foreseeable leakage. For outdoor storage, containment should also be adequate for any precipitation that can reach the storage area. Signage should be in accordance with state, federal, and local ordinances, which, depending on the material stored and the location, could include Occupational Safety and Health Administration’s (OSHA) Hazard Communication Standard, National Fire Protection Association (NFPA), Environmental Protection Agency (EPA), and other relevant authorities.

Equipment used to store and secure hazardous materials should be kept closed and maintained in good condition. Cabinets, tanks, dumpsters, boxes, drums, and other devices used to store hazardous materials should be suitable for the materials that they hold. They should be chemically compatible and have adequate capacity to
hold their intended volume. They should have no corrosion, deformities, or leakage. The hospital should inspect storage areas periodically, with high-risk areas being inspected the most frequently. The inspection frequencies should follow state and federal requirements. When there is no legal mandate for inspections, the hospital should designate an inspection frequency and document inspections. Inspection records should identify the name of the inspector, the date, what was inspected, and the findings of the inspection.

**Hazardous Materials Transfers on Hospital Grounds:** Without protection, the risk of endangerment due to hazardous materials can be particularly acute when they are transferred from one location to another. Risk points include drug, reagent, and other chemical unloading from delivery vehicles; loading of waste products onto waste transporter vehicles; pipe used to distribute gases (fuel, oxygen, etc.) throughout the hospital; and wheeled carts used to transfer items from storage areas to where they are used. The hospital should ensure that the equipment used for these transfers is suitable for the materials transferred. For example, the equipment should be chemically compatible and be able to withstand the weight and/or pressure of the material being conveyed.

**Tips:**
- Hazardous materials should be stored only in designated areas.
- Designated areas should have signage per applicable government regulations.
- To prevent releases, containers must be compatible with their contents, and containers should be stored within areas that are protected from the public, adequately secured, and provided with containment.
- Transfer systems and areas should be suitable for the materials transferred.
Program: Hospital
Chapter: Environment of Care (EC)
Standard Number: EC.02.02.01
Standard Text: The hospital manages risks related to hazardous materials and waste.

Element of Performance:
1. The hospital maintains a written, current inventory of hazardous materials and waste that it uses, stores, or generates. The only materials that need to be included on the inventory are those for which handling, use, and storage are addressed by law and regulation.

Scoring Categories:
Criticality level: Indirect
Documentation required: yes
Scoring category (A or C): A
Measure of Success: No

Implementation Suggestions:
(See also MM.01.01.03 in this BoosterPak™)

Be aware of the government agencies that classify hazardous substances, the associated regulations, and the characteristics of the substances that cause them to be placed within a category:
- Hazardous Chemicals—An OSHA term used to classify chemicals that pose hazards to workers during storage and use.
- Hazardous Materials—A US Department of Transportation (DOT) term for substances that pose a danger during transportation. Examples include infectious waste and many pharmaceutical products, as well as chemicals used in hospital labs, maintenance, and environmental services. Hazardous materials include hazardous wastes, as defined by the EPA.
- Hazardous Waste—An EPA term that classifies hazardous chemicals and/or materials that can pose a danger to health or the environment when they are disposed of.

Create a written procedure for determining which substances used within the facility should be classified as hazardous waste when they will be disposed of. Check to see if the waste is on one of the EPA lists.

Listed wastes are assigned a waste code that begins with the letter F, K, P, or U. There are many pharmaceuticals and other chemicals used within health care facilities on these lists. Both the P list and the U list apply to unused chemicals, including not only the chemical but also spill residues and container residues. The differ-
ence between the lists is that the chemicals on the P list are acutely hazardous, while the chemicals on the U list are toxic. Chemicals on either the P or U lists can have other hazards.

Generally speaking, health care facilities don't generate wastes on the K list. If the waste isn't on one of the aforementioned EPA lists, check to see if it displays any of these characteristics: ignitable, corrosive, reactive, or toxic. Characteristic wastes are assigned a waste code that begins with a D, such as D001 for ignitable hazardous waste. Determine which wastes display a characteristic by reviewing the Safety Data Sheet, product literature, or get the waste tested.

The lists of hazardous waste can be found at:
http://www.ecfr.gov/cgi/t/text/text-idx?c=ecfr;sid=9958facd13f0f01d91d23f2b84a5746e;rgn=div5;view=text;node=40%3A27.0.1.1.2;idno=40#40:27.0.1.1.2.4

The characteristics of hazardous waste can be found at:
http://www.ecfr.gov/cgi/t/text/text-idx?c=ecfr;sid=9958facd13f0f01d91d23f2b84a5746e;rgn=div5;view=text;node=40%3A27.0.1.1.2;idno=40#40:27.0.1.1.2.3

The US EPA empowers the states to expand on the scope of hazardous wastes subject to regulation. The health care facility should be familiar with the state regulations and determine if any of the wastes generated are subject to those regulations.

For pharmaceuticals, waste handling vendors may assist in prescreening the formulary and assist in performing classifications. Document all waste classification determinations.

Tips:
• The hospital should identify the safety hazards of materials to which staff and patients are exposed and then manage the risks to a level that the hospital deems acceptable. Hazards can be identified through the review of Safety Data Sheets, product inserts, and standard references.
• Each of these materials (hazardous chemicals, hazardous materials, and hazardous wastes) can be subject to significantly different state and federal requirements.
• All hazardous waste as defined by the EPA are also classified by the DOT as hazardous materials.
• The chemical inventory should be kept current. Whenever new chemicals are procured, they should be reviewed to determine if they are currently regulated while they are in storage or use, or if they will be subject to hazardous waste regulation when disposed of. All regulated chemicals should be to the inventory.
• Risk can be managed during the chemical review by evaluating the hazard and identifying potential options for product substitution or procurement of only amounts needed.
• The chemical review can also be used to designate appropriate labeling and safe storage locations.
Program: Hospital  
Chapter: Environment of Care (EC)  
Standard Number: EC.02.02.01  
Standard Text: The hospital manages risks related to hazardous materials and waste.

Element of Performance:
3. The hospital has written procedures, including the use of precautions and personal protective equipment, to follow in response to hazardous material and waste spills or exposures.

Scoring Categories:
Criticality level: Indirect  
Documentation required: yes  
Scoring category (A or C): A  
Measure of Success: No

Implementation Suggestions:
Maintain a written hazard communication plan for OSHA hazardous chemicals and a chemical hygiene plan for exposure to hazardous chemicals in laboratory settings.

The hazard communication plan must describe the facility’s:
- Chemical inventory
- Hazardous chemical labeling
- Safety Data Sheets, and how they will be made available to employees
- Employee training procedures
- How the institution will exchange information with other employers (on-site vendors) regarding hazardous chemicals at the institution or those that vendors bring into the workplace

The chemical hygiene plan must include:
- Standard procedures for safety and health involving the use of chemicals
- Criteria used to determine exposure controls (such as engineering controls or personal protective equipment [PPE])
- A requirement to ensure that fume hoods and other protective equipment are functioning and measures that will be used to ensure that this equipment performs adequately
- Training to be provided to lab employees
- A description of any circumstances under which a particular laboratory operation or activity requires prior approval
- Designation of personnel responsible for implementing the plan
- Provisions for specialized worker protection when they work with highly hazardous substances, such as select carcinogens, reproductive toxins, and substances that have a high degree of acute toxicity
- An annual review of the effectiveness of the plan

OSHA requires that engineering controls such as ventilation and chemical fume hoods be used to control exposure. OSHA also requires work practice controls such as limiting time and distance to the exposure. When engineering and work practice controls are not available, practical, or feasible, PPE may be considered.
Risks from exposure to hazardous chemicals and waste can be reduced by the selection of effective PPE. PPE selection should be based on a Job Safety Analysis (JSA), which is a systematic evaluation of the jobs, tasks, processes, and procedures workers perform routinely or occasionally. The JSA should begin with thorough identification of the potential hazards or risks and the consequences of these risks associated with each job. This should be followed by the specification of PPE or engineering control measures to eliminate or mitigate the hazards.

The risk of exposure to hazards during accidental chemical and waste spills should also be evaluated. If health care facility personnel will respond to incidental or significant spills, the JSA should consider the unique hazards that could be encountered.

Each type of PPE (such as gloves, respirators, and safety glasses) is effective only for certain applications. Therefore, the facility should obtain documentation from the manufacturer that the equipment is suitable for its intended application and duration at the facility. The hospital should be aware of certifications or approvals that may be required by the National Institute of Occupational Safety and Health (NIOSH) or OSHA for PPE and ensure that only equipment that conforms to these certifications is used.

Because your facility may have many different chemicals, compatibility is always a concern when chemicals are stored, used, and disposed of. Unfortunately, labels rarely have any information on compatibility; therefore, to find out what chemicals are incompatible with each other and the potential hazards, use Safety Data Sheets, product inserts, and peer reviewed technical literature. Chemicals that are known or suspected to be incompatible should be apart from each other, such as in separate cabinets, within separately diked areas, or by similar means. When wastes are generated, they too should be stored separately if they are incompatible.

Tips:
- Written hazard communication and chemical hygiene plans should be implemented.
- Engineering controls and PPE should be provided to minimize the risk of exposure to hazardous chemicals to an acceptable level.
- Engineering controls and PPE for both routine and occasional exposures should be based on documented JSAs.
- Personal protective equipment should meet the certification requirements of authoritative bodies, such as OSHA, NIOSH, or the American National Standards Institute (ANSI).
- Special precautions should be taken to identify chemicals that are incompatible. They should be stored separately.
Program: Hospital
Chapter: Environment of Care (EC)
Standard Number: EC.02.02.01
Standard Text: The hospital manages risks related to hazardous materials and waste.

Element of Performance:
4. The hospital implements its procedures in response to hazardous material and waste spills or exposures.

Scoring Categories:
Criticality level: Direct
Documentation required: No
Scoring category (A or C): A
Measure of Success: No

Implementation Suggestions:
Emergency procedures are required for both small quantity generators (SQGs) and large quantity generators (LQGs).

SQGs are those facilities that generate more than 100 kilograms (220 lb.), but less than 1,000 kilograms (2,205 lb.), of hazardous waste per month. If the site is an SQG, a sign must be posted near a phone in the accumulation area with the following information:
- Name and telephone number of Emergency Coordinator—the institution's person designated to implement and coordinate its emergency procedures
- Location of fire extinguishers, spill control equipment, and fire alarm
- Telephone number of fire department (unless there is a direct fire alarm)

LQGs are those facilities that generate 1,000 (2,205 lb.) kilograms or more of hazardous waste per month, more than 1 kilogram (2.2 lb.) per month of acutely hazardous waste, or more than 100 kilograms (220 lb.) per month of acute spill residue or soil. If the site is an LQG, the sign is not required; however, this information must be documented in a written “contingency plan” that also includes the facility's hazardous waste emergency response procedures and identifies any outside facilities that would assist in the event of an emergency.

Conditionally exempt small quantity generators (CESQGs) generate 100 kilograms (220 lb.) or less of hazardous waste per month, or 1 kilogram (2.2 lb.) or less of acutely hazardous waste per month. CESQGs are not federally required to implement emergency procedures.

Information must be available to inform staff on how to properly use, handle, and store hazardous chemicals. Safety Data Sheets (formerly called Material Safety Data Sheets, or MSDS) must be available for all hazardous chemicals.

Be aware of and list permissible exposure limits (PELs) for hazardous chemicals stored and used within the facility. If there is an indication of an exposure, check the SDS list for PELs as well as signs and symptoms of overexposure.

Consider industrial hygiene monitoring for nurses and pharmacists who are involved in the preparation and administration of chemotherapy medications.
Tips:

- The facility should have a central location for all staff to access if necessary. In addition, Safety Data Sheets pertinent to the chemicals stored and used in specific department should be kept within the department. Many facilities now have Safety Data Sheets available on their local intranet for quick and easy access and search functionality for any staff at any time.

- If hard copy Safety Data Sheets are kept within the facility, whenever updates become available a responsible party must be certain that the sheets are updated in a timely manner. If the facility utilizes on-line or electronic format Safety Data Sheets, be certain that updates are provided in regular intervals as appropriate.

- Some products that may be hazardous in nature may be identified as trade secret on the Safety Data Sheet. The practice of claiming a trade secret on a Safety Data Sheets can be done legally by chemical manufacturers and distributors; however, they cannot keep the identity of a chemical secret if this information is needed to treat an employee that is overexposed. The facility can contact the manufacturer using the phone number on the Safety Data Sheets to obtain the chemical identity as well as detailed recommendations for responding to overexposures.
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Management of Hazardous Waste in Health Care Facilities

Program: Hospital
Chapter: Environment of Care (EC)
Standard Number: EC.02.02.01
Standard Text: The hospital manages risks related to hazardous materials and waste.

Element of Performance:
5. The hospital minimizes risks associated with selecting, handling, storing, transporting, using, and disposing of hazardous chemicals.

Scoring Categories:
Criticality level: Indirect
Documentation required: No
Scoring category (A or C): C
Measure of Success: Yes

Implementation Suggestions:
The facility must put procedures in place to minimize exposure to chemicals, such as “Screen new chemicals, including pharmaceuticals, introduced into the facility.” This may best be done by a “chemical review committee” screening for safety concerns.

Buy, store, and use only the smallest amounts necessary to care for patients’ needs.

Any site that generates any hazardous waste must determine its status: large, small, or conditionally exempt.

Generators of hazardous waste are required to register with the EPA or their state and obtain an EPA Identification Number. However, if a site generates under 220 lb. of hazardous waste and under 2.2 lb. of acute hazardous waste, it is not required to register in most states. Identify the hazardous wastes that the facility generates on the registration form. If the facility generates any new wastes, update the form right away.

Staff members who are responsible for preparing hazardous waste for shipment must receive training on the requirements for shipping. (See also HR.01.04.01, EP 2, in this BoosterPak™)
• Regulated medical waste requires a hazardous material bill of lading (type of shipping document).
• Hazardous waste requires an EPA Hazardous Waste Manifest.
• The shipping papers must be signed by a staff member with DOT hazardous materials training, and the training must have been completed within the past three years.
• The shipping papers must be retained for two years if medical waste, and three years if hazardous waste.

The facility must utilize containers for hazardous waste disposal and transportation that meet DOT Hazardous Materials Regulations. Only staff members with DOT hazardous materials training select the appropriate container. The containers are filled and sealed per the manufacturer’s written instructions.
Tips:

- Generator status is determined based on the weight of hazardous waste generated per calendar month. This amount does not carry forward the amount that was generated the prior month and remains on-site. However, if a small quantity generator ever stores more than 6,000 kg (13,228 lb.) at any one time, the facility becomes a large quantity generator. Likewise, if a conditionally exempt small quantity generator ever stores more than 1,000 kg (2,205 lb.) at any one time, the facility becomes a small quantity generator.

- Consider retaining an industrial hygienist to determine if exposure monitoring is needed and conduct the recommended monitoring.
Program: Hospital  
Chapter: Environment of Care (EC)  
Standard Number: EC.02.02.01  
Standard Text: The hospital manages risks related to hazardous materials and waste.

Element of Performance:  
6. The hospital minimizes risks associated with selecting, handling, storing, transporting, using, and disposing of radioactive materials.

Scoring Categories:  
Criticality level: Direct  
Documentation required: No  
Scoring category (A or C): A  
Measure of Success: No

Implementation Suggestions:  
Personnel who handle or are exposed to radioactive material need to receive training that includes:  
• How radioactive materials are classified  
• The dangers of radioactive material  
• How to protect staff and patients  
• How to label radioactive materials  
• Storage procedures for products and waste  
• What to do in the event of a release or other emergency

Personnel that have job functions covered by the facility's license must also receive training on the requirements of the license.

Tips:  
• Locate a waste monitor near the exit where waste is managed as either regular trash or medical waste.  
• There must be a procedure for staff to follow when the radiation trash monitor alarms.  
• Radioactive materials need to be secured in an area that minimizes exposure until it has decayed and can be released as nonradioactive waste.  
• DOT hazardous materials training is required for staff that signs the shipping papers for radioactive isotopes or sources.  
  o A radiation safety committee and/or radiation safety officer is needed to provide oversight of the radiation safety program.  
  o Medical use of radioactive materials requires a general license, which specifies:  
    – Radiation safety officer  
    – Monitoring  
    – Security  
    – Recordkeeping  
    – Incident reporting  
• Some states have additional agreements with the Nuclear Regulatory Commission (NRC) to regulate transport and storage activities of radioactive waste. Check with the state agency regarding any additional requirements that may apply.
Program: Hospital  
Chapter: Environment of Care (EC)  
Standard Number: EC.02.02.01  
Standard Text: The hospital manages risks related to hazardous materials and waste.

Element of Performance:  
7. The hospital minimizes risks associated with selecting and using hazardous energy sources.  
   Note: Hazardous energy is produced by both ionizing equipment (for example, radiation and x-ray equipment) and nonionizing equipment (for example, lasers and MRIs).

Scoring Categories:  
Criticality level: Direct  
Documentation required: No  
Scoring category (A or C): A  
Measure of Success: No

Implementation Suggestions:  
The facility should have a laser safety program in place. Ionizing energy equipment should be under the control of a radiation safety committee or a radiation safety officer.

Hazardous energy sources and equipment should be located in locked or controlled areas.

For the safety of patients and operational staff, hazardous energy sources and equipment should be located in areas vented with an exhaust vacuum.

An emergency plan should be in place for releases of hazardous energy (quenching).

Protective eyewear should be utilized, specific to the type of laser equipment used.

Tips:  
• PPE for hazardous radiation should include eyewear, lead aprons, and collars.  
• Time, distance, and shielding should be used to minimize exposure.
Program: Hospital
Chapter: Environment of Care (EC)
Standard Number: EC.02.02.01
Standard Text: The hospital manages risks related to hazardous materials and waste.

Element of Performance:
8. The hospital minimizes risks associated with disposing of hazardous medications.

Scoring Categories:
Criticality level: Direct
Documentation required: No
Scoring category (A or C): C
Measure of Success: No

Implementation Suggestions:
(See also EC.02.02.01, EP 1 [inventory] and EP 12 [labeling], in this BoosterPak™)

When any waste is generated, it should be temporarily stored in the department that generated the waste. The health care facility must have a designated location(s) to store hazardous waste, other hazardous pharmaceuticals, regulated medical waste, radioactive waste, and nonhazardous solid waste. Because they are subject to significantly different legal requirements, and they could be incompatible, the various types of wastes must be stored separately.

Hazardous waste may be stored at the point of generation in each department or nursing unit that generates hazardous waste. These areas are known as satellite accumulation areas. Periodically, the waste is moved to a central storage area.

In satellite accumulation areas, up to 55 gallons of most hazardous waste can be accumulated. However, only a small amount of P-list waste, such as nicotine or warfarin, can be stored—just 1 quart. There is no time limit for the removal of waste from satellite accumulation areas; however, some states do set a one-year limit. The facility should be aware of any local and state requirements.

At a central accumulation area, hazardous waste must be handled in a way that prevents ruptures or releases, such as by using a containment system. The words Hazardous Waste must be visible on each container. The accumulation area and the containers in it must be inspected at least every seven days. The inspections must be documented. Aisle space must be adequate for anticipated emergency response and for the weekly inspections.

Incompatible wastes and nearby chemicals must be kept separate, and the area must be inspected weekly for leaks of containers, undamaged containment systems, and deterioration of containers.

Emergency preparedness and response equipment must be available to hazardous waste accumulation areas, including communication equipment that allows personnel in the area to report spills, fires, or other incidents; fire control equipment, if the material is flammable; and spill control equipment, if the material is spillable.
The facility must also put procedures in place to minimize exposure to chemicals, such as:

- Screen new chemicals, including pharmaceuticals, introduced into the facility. This may best be done by a “chemical review committee” screening for safety concerns.
- Buy, store, and use only the smallest amounts necessary to care for patients’ needs.

(See also EC.02.02.01, EP 5, in this BoosterPak™)

Tips:

- When waste is generated, it must be segregated. Not only because the rules for how each are labeled and disposed of are different, but also because it can be prohibitively expensive to manage all waste as though it displays all hazards. Each of these waste types should be stored in separate closed containers that are in good condition and have no leaks or deterioration:
  - Resource Conservation and Recovery Act (RCRA) hazardous waste
  - Non-RCRA hazardous waste
  - Incompatibles
  - Trace chemotherapy
  - Bulk chemotherapy
  - Regulated medical waste

- When incompatibles are mixed, they can catch fire, explode, or release toxic gases. Waste transport vehicles have caught fire due to incompatible pharmaceuticals being packed together. The facility should be able to demonstrate which materials are compatible or incompatible. Examples of wastes that should be accumulated separately include:
  - Incompatibles must be kept separate or risk: fire, explosions, or release of toxic gas.
  - Segregation examples: flammable liquids and aerosols are incompatible with corrosives; oxidizers are incompatible with acids, caustics, and flammables.
  - The containers used to hold these wastes must not be incompatible with their contents.

- Compliance with these requirements is regulated by both the federal EPA and authorized state environmental offices. States may be more stringent or broader in scope than the federal requirements. Therefore, the facility should contact its authorized state agency to ensure that it is in compliance with all applicable requirements.
Standards BoosterPak™ for
Management of Hazardous Waste in Health Care Facilities

Program: Hospital
Chapter: Environment of Care (EC)
Standard Number: EC.02.02.01
Standard Text: The hospital manages risks related to hazardous materials and waste.

Element of Performance:
9. The hospital minimizes risks associated with selecting, handling, storing, transporting, using, and disposing of hazardous gases and vapors.
   Note: Hazardous gases and vapors include, but are not limited to, glutaraldehyde, ethylene oxide, vapors generated while using cauterizing equipment and lasers, and gases such as nitrous oxide.

Scoring Categories:
Criticality level: Indirect
Documentation required: No
Scoring category (A or C): C
Measure of Success: Yes

Implementation Suggestions:
(See also EC.02.01.01, EP 5 [maintenance of grounds and equipment], in this BoosterPak™)

Be aware of and list PELs for hazardous chemicals stored and used within the facility. If there is an indication of an exposure check the Safety Data Sheets list for PELs as well as signs and symptoms of overexposure.

Note the storage of gases and chemicals that create vapors. Determine if the ventilation is appropriate and if the vapors are contained inside the storage or should be vented to the outdoors.

Using and handling gases and chemicals that release vapors should be done in a fume hood or other controlled ventilation system, separate from the facility heating, ventilating, and air-conditioning (HVAC) system.

The facility must also put procedures in place to minimize exposure to chemicals, such as, “Screen new chemicals, including pharmaceuticals, introduced into the facility.” This may best be done by a “chemical review committee” screening for safety concerns.

Buy, store, and use only the smallest amounts necessary to care for patients’ needs.

Tips:
• A risk assessment should be conducted to identify sources of hazardous gases and vapors. Potential areas for monitoring and corresponding sources of vapors include:
  o Operating Room (OR) and Post-Anesthesia Care Unit (PACU) for waste anesthetic gases (nitrous oxide and halogenated gases)
  o Histology and Microbiology for xylene, ethanol, methanol, other alcohols, and formaldehyde
  o Pathology/Morgue for formaldehyde
  o OR, Endoscopy, Obstetrics, and other areas where cold sterilization is performed
  o OR and other areas where cauterizing or laser equipment is used to monitor for particulates
Program: Hospital  
Chapter: Environment of Care (EC)  
Standard Number: EC.02.02.01  
Standard Text: The hospital manages risks related to hazardous materials and waste.

Element of Performance:
10. The hospital monitors levels of hazardous gases and vapors to determine that they are in safe range.
   
   Note: Law and regulation determine the frequency of monitoring hazardous gases and vapors as well as acceptable ranges.

Scoring Categories:
Criticality level: Direct  
Documentation required: no  
Scoring category (A or C): A  
Measure of Success: No

Implementation Suggestions:
The facility must put procedures in place to minimize exposure to chemicals, such as “Screen new chemicals, including pharmaceuticals, introduced into the facility.” This may best be done by a “chemical review committee” screening for safety concerns.

Buy, store, and use only the smallest amounts necessary to care for patients’ needs.

Be aware and list PELs for hazardous chemicals stored and used within the facility. If there is an indication of an exposure, check the Safety Data Sheets list for PELs as well as signs and symptoms of overexposure.

Tips:
(See also EC.02.02.01, EP 5, in this BoosterPak™)

• A risk assessment should be conducted to identify sources of hazardous gases and vapors. Potential areas for monitoring and corresponding sources of vapors include:
  o OR and PACU for waste anesthetic gases (nitrous oxide and halogenated gases)  
  o Histology and Microbiology for xylene, ethanol, methanol, other alcohols, and formaldehyde  
  o Pathology/Morgue for formaldehyde  
  o OR, Endoscopy, Obstetrics, and other areas where cold sterilization is performed  
  o OR, or other areas where cauterizing or laser equipment is used to monitor for particulates
Standards BoosterPak™ for Management of Hazardous Waste in Health Care Facilities

Program: Hospital
Chapter: Environment of Care (EC)
Standard Number: EC.02.02.01
Standard Text: The hospital manages risks related to hazardous materials and waste.

Element of Performance:
11. For managing hazardous materials and waste, the hospital has the permits, licenses, manifests, and Material Safety Data Sheets required by law and regulation.

Scoring Categories:
Criticality level: Indirect
Documentation required: yes
Scoring category (A or C): A
Measure of Success: No

Implementation Suggestions:
(See also EC.02.02.01, EP 1 [inventory], and EP 4 [Safety Data Sheets], in this BoosterPak™)

OSHA requires a Safety Data Sheet for all hazardous materials. The Safety Data Sheet should be retained as a good source for determining whether a material is a hazardous waste.

DOT requires shipping papers to be maintained for a period of time, such as medical waste manifests for two years and hazardous waste manifests for three years; both time periods begin the date the waste was shipped.

If a facility ships a large enough load of hazardous waste or hazardous materials to require the transport vehicle to be placarded per DOT regulations, the hospital must then obtain a DOT registration and develop a DOT Hazardous Materials Security Plan.

The NRC regulates the requirements for licensure that is necessary for radioisotopes, radioactive implants, radiation sources for brachytherapy, and radiation-producing equipment.

Reusable sharps containers (medical waste) are typically shipped with the sharps container on a rack. The transporter is required by regulation to obtain a special waiver for shipping medical waste outside the required parameters. The facility must have a copy of such variance in the event of a DOT inspection.

Some states require a medical waste registration number for facilities that generate medical waste, such as a hospital. If a facility generates hazardous waste, the hospital must obtain an EPA Identification Number which is used for tracking on hazardous waste manifests.

Tips:
• Hazardous waste and hazardous materials must be tracked as part of a comprehensive management structure. The mechanism for tracking hazardous materials and hazardous wastes is the shipping paper, or manifest.
Hazardous wastes are required to be shipped using a Uniform Hazardous Waste Manifest (EPA Form 8700-22). This manifest also operates as the DOT shipping paper. A manifest identifies the contents of the shipment, generator, transporter, and ultimate treatment, storage, or disposal facility. In this way, a hazardous waste is tracked from the point of generation until final disposal, or “cradle to grave.”

The manifest must be signed, certifying that the shipment has been properly prepared and is in proper condition for transportation. The person signing the manifest must comply with both EPA and DOT training requirements and have firsthand knowledge of the facts regarding a waste and its proper preparation for transport.

Copies of the manifest should be provided to the generator, each transporter, and the designated facility. Manifests must be retained on-site for at least three years from the date the waste was accepted by the initial transporter.
**Program:** Hospital  
**Chapter:** Environment of Care (EC)  
**Standard Number:** EC.02.02.01  
**Standard Text:** The hospital manages risks related to hazardous materials and waste.

**Element of Performance:**
12. The hospital labels hazardous materials and waste. Labels identify the contents and hazard warnings.

**Scoring Categories:**
- Criticality level: Indirect  
- Documentation required: No  
- Scoring category (A or C): A  
- Measure of Success: No

**Implementation Suggestions:**
*(See also EC.02.02.01, EP 8 [Labeling], in this BoosterPak™)*

The information on the label varies depending on where the waste is stored. Most departments in the hospital setting are classified as satellite accumulation areas because they store less than 55 gallons of hazardous waste and less than 1 quart of P waste. In this case, the containers are labeled with the words *Hazardous Waste*, and a description of the waste.

At the central accumulation area, the date the waste was moved to this area is added. This date is used to ensure that the waste isn’t stored more than legal time limits, which are three months for large quantity generators, and six months for small quantity generators.

In addition, although it isn’t an EPA or OSHA requirement, the OSHA hazard communication label is placed on waste containers as a best management practice so that the workplace hazards are communicated to our staff.

Chemicals in the workplace are labeled by the manufacturer, and these labels should not be removed. These labels include:
- Product name
- Hazard description. Many manufacturers use this color-coded system to identify hazards, which are ranked 0–4, with 4 being the greatest hazard for health, flammability, and reactivity hazards.
- PPE by a letter code
- Manufacturer information

Posters should be located throughout the facility so staff can determine the meaning of specific color or letter codes.
Tips:
• Labeling requirements are prescribed by the EPA RCRA hazardous waste requirements, the OSHA Blood-
borne Pathogens and Hazard Communications Standards, and the NFPA labeling codes and standards. All
three sets of regulations provide details on labeling requirements.
• While in use, containers should be labeled by a person with firsthand knowledge of the chemical in the
container.
• Ensure that labels accurately describe what is currently in the container, not what the container previously
held.
Program: Hospital
Chapter: Human Resources (HR)
Standard Number: HR.01.04.01
Standard Text: The hospital provides orientation to staff.

Element of Performance:
2. The hospital orients its staff to the key safety content before staff provides care, treatment, and services.
   Completion of this orientation is documented.

Scoring Categories:
Criticality level: Indirect
Documentation required: yes
Scoring category (A or C): C
Measure of Success: Yes

Implementation Suggestions:
All new employees are to receive hazard communication training that describes and reflects what is contained in the facility's written plan, such as where to locate and how to use Safety Data Sheets and how to work safely with chemicals in general.

Depending on where staff are assigned, they should also receive in-service training on the specific chemicals in their department, labels, Safety Data Sheets, hazardous communication plan, and where to find more information and how to report incidents. This training is documented and records are kept within the department.

The training is to be updated at the department level whenever new hazardous chemicals are introduced.

Any personnel who generate or handle hazardous waste are required to receive training annually or as required by type of generator (such as LQG or SQG) on how to classify and manage the waste properly.
Staff who generate or handle regulated medical waste must receive training that covers:
- How regulated medical waste is defined in their state
- How to safely store and segregate the waste
- The packaging, storage, and labeling requirements
- How to respond to spills

If the staff member is responsible for preparing hazardous waste for shipment, he or she must receive training on the requirements for shipping (See also specific requirements at EC.02.02.01 in this BoosterPak™):
- Regulated medical waste requires a bill of lading.
- Hazardous waste requires associated manifests.
- The shipping papers must be signed by a staff member with DOT hazardous materials training. The training must have been completed within the past three years.
- The shipping papers must be retained for two years if medical waste, and 3 years if hazardous waste.

Tip:
(See also EC.02.02.01, EP 6 [radioactive materials training], in this BoosterPak™)
Program: Hospital
Chapter: Leadership (LD)
Standard Number: LD.04.01.01
Standard Text: The hospital complies with law and regulation.

Element of Performance:
2. The hospital provides care, treatment, and services in accordance with licensure requirements, laws, and rules and regulations.

Scoring Categories:
Criticality level: Indirect
Documentation required: No
Scoring category (A or C): A
Measure of Success: No

Implementation Suggestions:
Be aware of the government agencies that classify hazardous substances, the associated regulations, and the characteristics of the substances that cause them to be placed within a category.

Leaders, in accordance with the details outlined within this BoosterPak™ and its references, should conduct leadership rounds to inspect and be shown what measures are in place to comply with these regulations. In addition, speaking directly with staff in all areas will help to ensure that implementation has taken place and that all are aware of their role. Seek a consistent response to questions throughout many areas of the facility where hazardous substances are used and disposed of.

(See also EC.02.02.01, EP 1, in this BoosterPak™)

Tips:
• See links within EC.02.02.01 of this BoosterPak™ for EPA lists of hazardous substances.
Program: Hospital  
Chapter: Medication Management (MM)  
Standard Number: MM.01.01.03  
Standard Text: The hospital safely manages high-alert and hazardous medications

Element of Performance:
1. The hospital identifies, in writing, its high-alert and hazardous medications.  
   (See also EC.02.02.01, EP 8, in this BoosterPak™)

Scoring Categories:
Criticality level: Indirect  
Documentation required: Yes  
Scoring category (A or C): A  
Measure of Success: No

Element of Performance:
2. The hospital has a process for managing high-alert and hazardous medications.  
   (See also EC.02.02.01, EP 8, in this BoosterPak™)

Scoring Categories:
Criticality level: Indirect  
Documentation required: No  
Scoring category (A or C): A  
Measure of Success: No

Element of Performance:
3. The hospital implements its process for managing high-alert and hazardous medications.  
   (See also EC.02.02.01, EPs 1 and 8, in this BoosterPak™)

Scoring Categories:
Criticality level: Direct  
Documentation required: No  
Scoring category (A or C): C  
Measure of Success: Yes

Implementation Suggestions:
Hazardous medications are those in which studies in animals or humans indicate that exposure to them have potential for causing cancer, developmental or reproductive toxicity, or harm to organs. Lists of hazardous medications are available from NIOSH at http://www.cdc.gov/niosh/docs/2012-150/pdfs/2012-150.pdf.

For safe management, the hospital needs to develop its own list(s) of hazardous medications based on its unique utilization patterns of medications. It is up to the hospital to determine whether medications added to the formulary should be classified as RCRA hazardous waste (on the P or U list), or if the medications are of a defined characteristic that would require adherence to the regulations for proper management and disposal.
Tips:

- After the initial formulary characterization, in which all medications are reviewed and identified for RCRA listings, it is advisable for the hospital to review new medications for RCRA designation as they are considered for formulary addition.

- The facility should determine the best methodology for alerting staff of the status and designation if the medication is included as an RCRA–associated medication. Seek out similar facilities that may have a methodology in place and ascertain ideas for methods that may work within the facility's organizational culture. The idea is to provide a method of communicating how the medication is to be handled based on RCRA and NIOSH guidelines. Methods such as indicators on labeling, medication administration record indicators, and notices when scanning medications at the time of administration have been used.

- Facilities may also seek out assistance from waste handling companies to facilitate formulary characterizations, training, and methods for waste collection and segregation.
B. Frequently Asked Questions, Definitions, and Additional Information
Section B1: Frequently Asked Questions (FAQs)

Q: How should chemicals be evaluated for their impact on patients, staff, visitors, and waste generation?
A. Before any new substances are brought into the hospital, staff should review the Safety Data Sheet for safe storage and handling instructions, how the material must be classified if it will be disposed of, appropriate disposal procedures, and what personal protection equipment and engineering controls are needed to protect staff, and visitors, if applicable.

Q: Are unused chemicals or pharmaceuticals regulated as hazardous waste?
A. Both the P and U lists apply only to unused chemicals or pharmaceuticals when there is just one active ingredient that’s on these lists. These include off-specification chemicals (such as those that have expired), spill residue, and container residue.

Containers that have previously held P-list chemicals are not classified as empty unless they have been triple rinsed. If not rinsed, the container is P-list hazardous waste.

Containers that have previously held U-listed chemicals are classified as empty if they have been fully drained and have less than 1 inch or 3% by weight remaining in them.

Note that any material rinsed or drained from the containers would be classified as hazardous waste.

Q: What are common types of “characteristic hazardous waste”?
A. Ignitable wastes: Include liquids with flash points under 140°F (60°C). Syrups that contain alcohol or waste hexane from the histology lab are typically ignitable. Nonliquids that burn when exposed to friction or moisture, such as bromine or lithium, are also ignitable. Also classified as ignitable are flammable gases and oxidizers, such as ethylene oxide, propane, and calcium hypochlorite.

Corrosive: Aqueous materials with a pH of less than or equal to 2.0, or greater than or equal to 12.5, are corrosive. Examples include formic acid, sodium hydroxide solution, and glutaraldehyde.

Reactive: Unstable and react violently with water; form explosive mixture with water; generate toxic gases, vapors, or fumes when mixed with water; capable of detonation if heated under confinement or subjected to a strong initiating source.

Q: Is there a list of hazardous pharmaceuticals?
A. Yes, there is. One should identify the drugs that are listed as hazardous by NIOSH or the ASHP (American Society of Health-System Pharmacists).

These “NIOSH Alert” drugs may be classified as being hazardous in occupational settings or for waste disposal.
Q: Is there a standard labeling requirement?
A. OSHA adopted a new “globally harmonized system” or GHS for labels as part of its changes to the Hazard Communication Standard. Some manufacturers are putting new international hazard warning labels on their chemicals because OSHA is adopting GHS. We recently updated our staff’s hazard communication training so that they understand the labels. The new GHS system includes:
   - Product name
   - Pictograms
   - Signal word (“Warning” or “Dangerous”)
   - Hazard statements that explain what the hazards are to workers
   - Precautionary statements on how to work safely with the chemical
   - Manufacturer identification

Note: The effective dates for compliance with the Standard are phased beginning with training to the labeling requirements and use of the Safety Data Sheets (SDS) by December 1, 2013. For the complete summary of changes, see the Hazard Communication Standard Final Rule located on the OSHA website.

Q: How are radioactive materials labeled?
A. OSHA, 29 CFR 1910, General Industry – Subpart Z specifies how containers of licensed radioactive material is labeled and the requirements include the standard radiation symbol and the words “CAUTION, RADIOACTIVE MATERIAL” or “DANGER, RADIOACTIVE MATERIAL.” The label also must provide sufficient information (such as the radionuclide[s] present, an estimate of the quantity of radioactivity, the date for which the activity is estimated, radiation levels, kinds of materials, and mass enrichment) to permit staff handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures.

Q: When should waste be moved from the nursing unit or department to the central storage area?
A. The difference between satellite accumulation and central accumulation is the amount of hazardous waste, the time it can be stored, and the location. At a satellite accumulation area, up to 55 gallons of hazardous waste can be accumulated without a time limit. However, at a central accumulation area, there is a time limit of up to 90 days for large quantity generators, and 180 days for small quantity generators, but no volume limit. To track the time frames, each container in the central accumulation area must be marked or labeled with a start date.

Q: We have to dispose of our infectious waste in our biohazard waste containers to prevent exposure to our staff. If the waste also contains a medication that is considered hazardous, how do we manage this situation?
A. Sometimes, it can be difficult or impossible to segregate infectious waste from hazardous waste. For example, on a surgical unit, pharmaceuticals and body fluids can be comingled. Wastes that are both biohazards and hazardous waste are classified as “dual wastes.” They must be designated as such and stored separately from other wastes. They will be subject to the regulations that apply to both hazardous waste and medical waste.
Section B2: Definitions of Key Terms

Acutely hazardous. Acute hazards are defined as conditions that create the potential for injury or damage to occur to humans or environmental receptors as a result of an instantaneous or short duration exposure to the effects of an accidental release. These conditions may be either chemical or physical in nature and may include toxic, flammable, reactive, explosive, or radioactive hazards.

The EPA evaluates the severity of acutely toxic chemicals by measuring the concentration or dose level that could cause death or serious irreversible health effects after a short exposure. For physical hazards, EPA focuses on other types of effects, such as blast waves from vapor cloud explosions from a flammable substance, as the most serious hazard.

Characteristic wastes. Waste that has not been specifically listed may still be considered hazardous waste if it exhibits one of the four characteristics defined in 40 CFR, Part 261, Subpart C—ignitability (D001), corrosivity (D002), reactivity (D003), and toxicity (D004–D043).

1. Ignitability. Ignitable wastes can create fires under certain conditions, are spontaneously combustible, or have a flash point less than 140°F (60°C). Examples include waste oils and used solvents. For more details, see 40 CFR §261.21. Test methods that may be used to determine ignitability include the Pensky-Martens Closed-Cup Method for Determining Ignitability (Method 1010A), the Setaflash Closed-Cup Method for Determining Ignitability (Method 1020B), and Ignitability of Solids (Method 1030).

2. Corrosivity: Corrosive wastes are acids or bases (pH less than or equal to 2.0, or greater than or equal to 12.5) that are capable of corroding metal containers, such as storage tanks, drums, and barrels. Battery acid is an example. For more details, see 40 CFR §261.22. The test method that may be used to determine corrosivity is Corrosivity Towards Steel (Method 1110A).

3. Reactivity: Reactive wastes are unstable under “normal” conditions. They can cause explosions, toxic fumes, gases, or vapors when heated, compressed, or mixed with water. Examples include lithium-sulfur batteries and explosives. For more details, see 40 CFR §261.23. There are currently no test methods available.

4. Toxicity: Toxic wastes are harmful or fatal when ingested or absorbed (for example, containing mercury, lead, etc.). When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute ground water. Toxicity is defined through a laboratory procedure called the Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311). The TCLP helps identify wastes likely to leach concentrations of contaminants that may be harmful to human health or the environment. For more details, see 40 CFR §261.24.

Chemical health hazards. Those chemicals that pose a health hazard whereby they cause the occurrence of signs or symptoms of a change in body function in the exposed individual. The signs and symptoms may be of the nature to cause acute toxicity; eye irritation, corrosion, or damage; respiratory and/or skin sensitization; germ cell mutagenicity, carcinogenicity; reproductive toxicity; specific target organ system toxicity; or an aspiration hazard.

Hazardous chemicals. This is a term that OSHA uses to describe any chemicals that pose either a physical hazard or a health hazard to workers and are either stored or used within the facility.

Hazardous materials. A hazardous material is defined as any substance or material that could adversely affect the safety of the public, handlers, or carriers during transportation.
All Department of Transportation (DOT) hazardous materials are listed in the DOT’s Hazardous Materials Table: http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Hazmat/Hazmat%20Table.xls.

1. Substances that are subject to DOT requirements if transported to or from a facility, as in the case of shipping materials off site when they become wastes. There are stringent requirements for hazardous waste material containers, labels, and documentation. If the material is listed on the Hazardous Materials Table, or if it displays any of the nine hazard classes, or if it has been identified as an EPA hazardous waste, it then is classified as a hazardous material.

2. Examples of DOT hazardous materials include explosives; gases; flammable liquids, flammable solids, oxidizers and organic peroxides, toxic or infectious materials, radioactive materials, corrosives, and miscellaneous items.

**Hazardous Substance.** A comprehensive designation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for RCRA hazardous wastes as well as other toxic pollutants regulated by the Clean Air Act, Clean Water Act, and Toxic Substances Control Act. The EPA has the authority under CERCLA to designate any additional element, compound, mixture, or solution as a hazardous substance. The definition of *hazardous substance* specifically excludes petroleum and natural gas.

**Hazardous waste.** An EPA term that classifies hazardous chemicals and/or materials that eventually become waste during the course of their existence. *Hazardous waste* is defined as liquid, solid, contained gas, or sludge wastes that contain properties that are dangerous or potentially harmful to human health or the environment. Under the RCRA program, hazardous wastes are specifically defined as wastes that meet a particular listing description or that exhibit a characteristic of hazardous waste.

**Listed wastes.** Wastes that are considered hazardous under RCRA because they meet specific listing descriptions.

**Mixed waste.** Radioactive waste that is also a hazardous waste under RCRA. Such wastes are jointly regulated by RCRA and the Atomic Energy Act.

**Permissible exposure limits (PELs).** OSHA sets enforceable PELs to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. They may also contain a skin designation. OSHA PELs are based on an eight-hour time weighted average (TWA) exposure.

PELs are addressed in specific standards for general industry, shipyard employment, and the construction industry.

**Physical health hazards.** Defined by OSHA as chemicals that pose physical or health hazards, such as explosives; flammable gases, liquids, solids or aerosols; oxidizing liquids, solids, or gases; gases under pressure; self-reactive substances; pyrophoric liquids or solids; self-heating substances; substances that emit flammable gases on contact with water; organic peroxides; and substances that are corrosive to metals.

**Radioactive waste.** Any waste that emits energy as rays, waves, or streams of energetic particles. Radioactive materials are often mixed with hazardous waste, usually from nuclear reactors, research institutions, or hospitals.
**Resource Conservation and Recovery Act (RCRA).** The law from which the Environmental Protection Agency (EPA) derived the hazardous waste regulations.

**Regulated medical waste.** Under the Medical Waste Tracking Act of 1988, regulated medical waste is any solid waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals. Included are cultures and stocks of infectious agents; human blood and blood products; human pathological body wastes from surgery and autopsy; contaminated animal carcasses from medical research; waste from patients with communicable diseases; and all used sharp implements, such as needles and scalpels, and certain unused sharps.

**Safety Data Sheet (SDS).** Previously referred to as a Material Safety Data Sheet (MSDS) an SDS is a document containing information and instructions on hazardous materials present in the workplace; SDSs contain details about hazards and risks relevant to the substance, requirements for its safe handling, and actions to be taken in the event of fire, spill, or overexposure.

**Trade secret.** Defined by 29 CFR 1910.1020(c)(14) as any confidential formula, pattern, process, device, or information or compilation of information that is used in an employer's business and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. See the following link for a complete definition and description of trade secret by OSHA: https://www.osha.gov/dsg/hazcom/appendix_e.pdf
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