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Safety

PROCESS SAFETY MANAGEMENT (PSM)

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This instruction implements the requirements in Air Force Occupational Safety and Health (AFOSH) Standard 91-119, *Process Safety Management (PSM) of Highly Hazardous Chemicals*, which is derived from 29 Code of Federal Regulations (CFR) 1910.119 for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. This instruction ensures an adequate PSM program is in place by implementing the required elements of the Occupational Safety and Health Administration (OSHA) and AFOSH. This instruction documents the 45th Space Wing employee participation, record management, and implementation. This instruction applies to both military members and civilian government employees.

SUMMARY OF REVISIONS

The 2003 revision clarifies the roles of 45 SW organizations in developing and implementing compliant PSM programs. This revision assigns responsibilities based on each organization's level of access to PSM-covered processes. This revision also strengthens the role of the PSM Team. The team is essential in coordinating the use of common resources with organizational PSM programs. Two appendices were added: one shows the covered chemicals at CCAFS and the other provides a checklist for each of the PSM program elements.

1. Purpose. This instruction provides specifics on how 45 SW and US Air Force tenant organizations shall comply with AFOSH 91-119 regarding Process Safety Management of highly hazardous chemicals.

1.1. Application.

1.1.1. This instruction is applicable to all Air Force organizations involved with operations at Cape Canaveral Air Force Station (CCAFS) or Patrick AFB, including tenant organizations.

1.1.2. **Attachment 1** contains a list of the PSM-covered processes currently located at CCAFS. The list includes chemicals covered by the PSM regulation and those included by the 11 March 1996 memo from HQ USAF/SE. There are currently no covered processes at Patrick AFB.

1.1.3. Contractors are required by law (29 CFR 1910.119) to develop compliant PSM programs and are not covered under this instruction. The Air Force is restricted from placing additional requirements on contractors by AFI 91-202, *Air Force Mishap Prevention Program*. Paragraph 3.5 of AFI 91-202 states, in part:

“AF Safety personnel must not put anything in a contract that establishes a requirement for the Air Force to protect contractor employees or their equipment. Likewise, do not include anything in inspection or surveillance programs to give the perception that the Air Force is supervising or observing contractor personnel to provide for their personal safety or to ensure the safety of their equipment. If an Air Force inspector notices a potential OSHA violation, he/she should report the hazard to the contracting officer, who can remind the contractor of the obligation under the contract to comply with all pertinent regulations.”

1.1.4. The 45 SW personnel requiring information, support, or written PSM certification from booster, payload, or range contractors shall coordinate with and obtain the information through the Program Office/Contract Management Office (i.e. 45 LCG, Cape Canaveral Spaceport Management Office (CCSMO), 45 RMS or 45 CONS) or offsite SPO, and not directly from the contractor. The Contract Management Office shall insure proper PSM requirements and provisions are contained in each contract and should encourage contractors involved with covered processes to participate in PSM Team activities.

2. Responsibilities.

2.1. Wing Safety (45 SW/SE).

2.1.1. Serve as the lead organization for implementing the installation PSM program.

2.1.2. Manage the overall Wing PSM program and chair the 45 SW PSM Team.

2.1.3. Monitor and assist AF PSM implementation of all covered process areas.

2.1.4. Provide input to and ensure that the *Cape Canaveral Air Force Station Safety Guide* meets the requirements of PSM Level I access.

2.1.5. Provide toxic modeling of dispersion and support other aspects of Emergency Response as members of the Disaster Control Team.

2.1.6. Coordinate with 45 CES/CEV on common EPA Risk Management Plan (RMP) and PSM requirements to ensure full compliance with both programs without duplication of effort.

2.2. **PSM Team.** The team consists of representatives of 45 SW/SES, 45 SW/SEG, 45 CES/CEV, 45 OG, 45 RMS, 45 ADOS/SGGB (BE), 45 MSG, 45 LCG and USAF personnel with Access Level III and IV per paragraph 2.7.

2.2.1. Meet as necessary to coordinate PSM implementation. Approve each organization's recommended Access Level. Approve each PSM Plan submitted by tasked organizations per paragraph 2.7.

2.2.2. Track status of discrepancies and report status in commander's quarterly safety briefing.

2.2.3. Assess whether or not any chemical is covered under PSM.

2.2.4. Conduct yearly audits of Access Level IV organizations and audits every three years of Access Level III organizations. Audits may be conducted by a single member or more than one member of the team.

2.2.5. Maintain PSM Data Repository. The PSM Team shall maintain a current list of covered processes showing location, responsible organization and contact information. US Air Force organizations will be responsible for keeping required PSM documentation in a central organizational location at the squadron or group level. The PSM Team chairman will maintain a directory of these locations to provide a single point of contact for outside agencies and/or auditors.

2.3. The 45 LCG Launch Group (1 SLS, 3 SLS, 5 SLS).

2.3.1. Appoint a PSM representative to participate as a member of the 45 SW PSM Team.

2.3.2. As a user present during hazardous operations, coordinate training for squadron personnel with the PSM program for assigned facilities.

2.4. Bioenvironmental Engineering (45 ADOS/SGGB).

2.4.1. Appoint a PSM representative and participate as a member of the 45 SW PSM Team.

2.4.2. Responsible for workforce and community health issues related to Process Safety Management.

2.4.3. Provide technical advice and support to AF organizations.

2.4.4. Provide technical advice and support to other organizations as requested.

2.5. Mission Support Group (45 MSG).

2.5.1. Contracting Squadron (45 CONS) responsibilities:

2.5.1.1. Assist in the development of standardized safety language to be placed in contracts for each area where PSM requirements apply.

2.5.1.2. Provide contracting advice on PSM matters when requested by the PSM Team.

2.5.2. The 45 Civil Engineering Squadron (45CES) responsibilities:

2.5.2.1. Appoint a PSM representative and participate as a member of the 45 SW PSM Team.

2.5.2.2. Provide technical advice on possible fire effects of the failure of controls as outlined in 29 CFR 1910.119(e)(3).

2.5.2.3. Review PHAs as requested by the PSM Team to determine the technical accuracy of the fire effects and technical viability of the recommendations for fire control measures.

2.5.2.4. Coordinate with 45 SW/SE on common EPA Risk Management Plan (RMP) and PSM requirements to ensure full compliance with both programs without duplication of effort.

2.5.2.5. Provide technical advice on the fire hazards of process chemicals covered under the requirement of this instruction and 29 CFR 1910.119(d)(1).

2.5.2.6. Ensure the Fire Department maintains the Hot Work Permit program implemented by Level IV users and support contractors. Review and approve Hot Work Permit requests.

2.5.2.7. Participate in Emergency Planning functions and review Process Hazard Analyses

(PHAs) as requested by the PSM Team.

2.5.2.8. Ensure facility-related recommendations made through process hazard analyses, incident investigations, and PSM audits are implemented as funded.

2.5.2.9. As the OPR for the Hazardous Material Pharmacy, will provide advice and information to the PSM Team about chemicals present.

2.5.2.10. CES is responsible for pressure vessels, but actual certification is performed by a 45 SW/SE contractor.

2.6. The 45 OG Operations Group.

2.6.1. Appoint a PSM representative and participate as a member of the 45 SW PSM Team.

2.6.2. Provide technical support for operations involving covered processes and facilities.

2.7. **All Organizations.** Users of hazardous facilities/processes are divided into four groups defined by the level of access to covered processes and responsibility of employees. AF organizations are responsible for those elements which are necessary for the safety of their employees. Each organization is responsible for developing an organizational PSM plan that documents their PSM program. They coordinate with the organizations operating the process to achieve compliance. **Table 1.** shows the user responsibilities based on the level of employee participation in covered processes.

2.7.1. Organizations having no access to facilities with PSM-covered processes – Access Level I - (e.g., vendors and delivery companies under AF contract, 45 CPTS, 45 SVS) are not responsible for any of the PSM elements. However, organizations of this type (including providers of incidental services to areas outside the hazardous areas) should ensure employees are aware of the provisions of the *Cape Canaveral Air Force Station Safety Guide*, including descriptions of emergency notification signals.

Table 1. Organization Responsibilities for PSM Elements.

| Para | OSHA 1910.119() | Description | Access Level I Employees have no access to covered process areas | Access Level II Employees have no access during covered process ops | Access Level III Employees are present during covered process ops as witnesses only | Access Level IV Employees operate, maintain or test covered processes |
|------|-----------------|----------------------------------|--|---|---|---|
| 3.1 | c | Employee Participation | | X | X | X |
| 3.2 | d | Process Safety Information (PSI) | | X | Note 1 | X |
| 3.3 | e | Process Hazard Analysis (PHA) | | | Note 1 | X |
| 3.4 | f | Operation Procedures | | | Note 1 | X |
| 3.5 | g | Training | | X | X | X |
| 3.6 | h | Contractors | | | | X |
| 3.7 | i | Pre-Startup Safety Review | | | | X |
| 3.8 | j | Mechanical Integrity | | | | X |
| 3.9 | k | Hot Work Permit | | | | Note 2 |
| 3.10 | l | Management of Change | | | | X |
| 3.11 | m | Incident Investigation | | | | X |
| 3.12 | n | Emergency Planning and Response | | X | X | X |
| 3.13 | o | Compliance Audits | | Note 3 | Note 3 | Note 3 |
| 3.14 | p | Trade Secrets | | | | X |

Note 1: Individuals review and become familiar with information for their own personal safety as part of training/emergency response (documented in AF Form 55).

Note 2: . The Level IV user implements the program which is approved by CCAFS Fire Protection which is responsible for the Hot Work Permit program.

Note 3: Assist PSM Team in performance of PSM audits.

2.7.2. Organizations having access to facilities with PSM-covered operations, but not during PSM-covered operations – Access Level II - (e.g., 45 SW/PA, 1 ROPS, 45 CES, CCSMO), shall:

2.7.2.1. Participate in the PSM Team if personnel are involved with any PSM activities.

2.7.2.2. Develop and implement written PSM plans for required PSM elements.

- 2.7.2.3. Provide training to employees in emergency response and evacuation, and the hazards associated with covered processes when not in use.
- 2.7.2.4. Coordinate emergency response and evacuation plans with the operator of the facility.
- 2.7.3. Organizations with personnel present during PSM-covered operations - Access Level III - (e.g., 1 SLS, 3 SLS, 45 OSS, 5 SLS, Operations Safety) shall:
 - 2.7.3.1. Appoint a PSM representative and participate as a member of the 45 SW PSM Team.
 - 2.7.3.2. Develop and implement written PSM plans for assigned facilities with PSM covered processes.
 - 2.7.3.3. Provide training to employees in emergency response and evacuation, and the hazards associated with covered processes when in use.
 - 2.7.3.4. Coordinate emergency response and evacuation plans with the operator of the facility.
- 2.7.4. Organizations operating, maintaining, and testing PSM-covered operations – Access Level IV - (*Note: There are currently no AF organizations in this category.*) shall:
 - 2.7.4.1. Appoint a PSM representative and participate as a member of the 45 SW PSM Team.
 - 2.7.4.2. Develop OSHA-compliant PSM programs covering the covered processes per AFOSH 91-119 / 29 CFR 1910.119.
 - 2.7.4.3. Coordinate Emergency Response and Fire Protection activity with AF organizations through the PSM Team.
 - 2.7.4.4. Coordinate training of employees of Level I and Level III organizations through the PSM Team.
 - 2.7.4.5. Provide up-to-date point of contact information for technical information and emergency response to PSM team.

3. OSHA Compliance Guidelines. There are 14 different process safety management program elements defined by OSHA. The elements are listed below. **Attachment 2** contains a checklist of those items that should be considered for each applicable element of an organization's PSM Plan, if one is required.

- 3.1. Employee Participation.
- 3.2. Process Safety Information.
- 3.3. Process Hazard Analysis.
- 3.4. Operating Procedures.
- 3.5. Training.
- 3.6. Contractors.
- 3.7. Pre-startup Safety Review.
- 3.8. Mechanical Integrity.
- 3.9. Hot Work Permits.
- 3.10. Management of Change.

- 3.11. Incident Investigation.
- 3.12. Emergency Planning and Response.
- 3.13. Compliance Audits.
- 3.14. Trade Secrets.

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Vice Commander

Attachment 1

LIST OF COVERED CHEMICALS

Table A1.1. PSM Covered Chemicals¹ in Use at CCAFS.

| Covered Chemical | CAS | Threshold Quantity | Location (Maximum Potential On-site Quantity) |
|------------------------------------|------------|------------------------|--|
| Nitrogen Tetroxide | 10544-72-6 | 250 lbs (20.7 gal) | LC-40 (304,920 lbs), SPIF (2600 lbs), LC-36 A & B (3000 lbs), LC-17A & B (12,500 lbs), DPF (1800 lbs), FSA-1 (31,250 lbs) ⁵ , LC-37 (5,000 lbs) ⁶ , LC-41 (5,000 lbs) ⁶ |
| Aerozine-50 ² | | 100 lbs (13.3 gal) | LC-40 (164,989 lbs), LC-17A & B (6,790 lbs), FSA-1 (18,750 lbs) ⁵ |
| Hydrazine (Anhydrous) ² | 302-01-2 | 100 lbs (11.9 gal) | LC-40 (340 lbs), SPIF (1400 lbs), SMAB East Bay (735 lbs), LC-36A & B (2170 lbs), LC-17A & B (170 lbs), DPF (800 lbs), FSA-1 (21,000 lbs) ⁵ , LC-37 (640/3000 lbs) ⁶ , LC-41 (340 lbs/3000 lbs) ⁶ |
| Monomethyl Hydrazine | 60-34-4 | 100 lbs (13.7 gal) | SPIF (1600 lbs), LC-36 A & B (2740 lbs), DPF (1100 lbs), LC-17B (2740 lbs), LC-37 (4,000 lbs) ⁶ , LC-41 (4,000 lbs) ⁶ |
| UDMH | 57-14-4 | 1000 lbs (151.5 gal) | FSA-1 (10,416 lbs) ⁵ |
| Liquid Hydrogen ³ | 1333-74-0 | 10,000 lbs (16949 gal) | LC-40 (14,868 lbs), LC-41 (24,780) ⁶ , LC-36A & B (14,868 lbs), LC-17B (10,023 lbs), LC-37 (501,500 lbs) |
| Propane ³ | 74-98-6 | 10,000 lbs | LC-40 (10,023 lbs) |
| Ammonium Perchlorate ⁴ | 7790-98-9 | 7500 lbs | SMARF (2,168,972 lbs) |

NOTES:

1. By direction from Space Command, covered chemicals and processes shall be as described in memo from HQ USAF/SE, dated 11 March 1996. The position of Space Command is that all hypergol fuels (in excess of threshold quantity) and open grain AP, in addition to other chemicals on the OSHA covered list, are processes covered by the PSM regulation.
2. The threshold quantities for hypergol fuels that are not on the OSHA list will be the same as for methyl hydrazine (100 pounds). The added chemicals are Aerozine-50 (A-50) and Hydrazine (N_2H_4) with assumed threshold quantities of 100 pounds each.
3. Propane and hydrogen are covered under 29 CFR 1910.119 (a)(ii), a process which involves a flammable liquid or gas on site in one location, in a quantity of 10,000 pounds (4535.9 kg) or more not used solely for workplace consumption as a fuel.
4. Handling of ammonium perchlorate (AP) during open grain SRMU operations is currently assumed a covered process during open grain operations. The PSM threshold for ammonium perchlorate does not apply to processes involving solid motors that are containerized (non-open grain operations).
5. Although FSA-1 is operated by NASA and its contractors, it is located on Air Force property. Therefore, on-site inventories are provided here.
6. Estimates dependent upon spacecraft propellant load. When listed, first number is the upper stage quantity.

Attachment 2

PSM ELEMENT CHECKLISTS

The following checklists provide top level guidance on what steps and/or information must be included for each element in a PSM Program. All elements may not be applicable to a given organization depending on the organization's involvement with the covered process. More detailed information on each element is contained in the OSHA Compliance Program Letter 2-2.45, Appendix A, "*PSM Audit Guidelines*."

A2.1. EMPLOYEE PARTICIPATION.

- A2.1.1. Have employees been involved with the development and implementation of the unit PSM program?
- A2.1.2. Is there a written program/plan regarding employee participation?
- A2.1.3. Has the employee participation been documented?
- A2.1.4. Do employees have access to all PSM information?

A2.2. PROCESS SAFETY INFORMATION.

- A2.2.1. Has written process safety information been compiled *before* conducting any PHAs?
- A2.2.2. Does the information include details of the:
 - A2.2.2.1. Hazards of the chemicals in the process (e.g., toxicity, reactivity, etc.).
 - A2.2.2.1.1. Technology of the process (e.g., flow diagrams, safe limits, etc.).
 - A2.2.2.1.2. Equipment in the process (e.g., materials, compliance with codes, etc.).
- A2.2.3. Are Material Safety Data Sheets (MSDSs) available to employees?

A2.3. PROCESS HAZARD ANALYSIS.

- A2.3.1. For new processes, are initial PHAs prioritized and performed as soon as possible?
- A2.3.2. Are existing PHAs updated and revalidated at least every 5 years?
- A2.3.3. Is an appropriate methodology used to determine and evaluate the process hazards? See CFR 1910.119(e)(2) for guidance.
- A2.3.4. Does the PHA address all the items in CFR 1910.119(e)(3)?
- A2.3.5. Does the PHA team include the following?
 - A2.3.5.1. At least one employee with specific experience and knowledge of the process.
 - A2.3.5.2. At least one employee knowledgeable in the PHA methodology used.
- A2.3.6. Is there an adequate system in place to resolve findings/recommendations in a timely manner?
- A2.3.7. Are PHAs, updates, and corrective actions kept for the life of the process?
- A2.3.8. If not the process owner/operator:

A2.3.8.1. Do you have access to the PHAs?

A2.3.8.2. Do the PHAs provide adequate information to train your employees?

A2.4. OPERATING PROCEDURES.

A2.4.1. Do written procedures exist for each covered process?

A2.4.2. Do the procedures include:

A2.4.2.1. The entire process, including emergency shutdowns and start-ups?

A2.4.2.2. Operating limits?

A2.4.2.3. Safety and health considerations (hazards, controls, PPE, safety systems)?

A2.4.3. Are the procedures:

A2.4.3.1. Consistent with PSM information?

A2.4.3.2. Readily accessible to employees?

A2.4.3.3. Reviewed and updated on a regular basis?

A2.4.4. Have safe work practices (Lockout/Tagout; Confined Space Entry) been implemented?

A2.5. TRAINING.

A2.5.1. Do training records exist for both initial and refresher training?

A2.5.2. Is initial training completed prior to the employee's participation in the covered process?

A2.5.3. Is the level of training appropriate for the employee's role (witness vs operator vs maintenance)?

A2.5.4. Is the frequency of refresher training adequate? Is it at least once every 3 years? Were the employees involved in the process consulted?

A2.5.5. Are contractors and/or visitors included in the training?

A2.6. CONTRACTORS.

A2.6.1. This element is unique for Air Force contractors (See paragraph 1.1.3.). Any discrepancies noted in contractor programs must be worked through the government contract management office and not directly with the contractor.

A2.6.2. Are support contractor employees informed of potential hazards present on CCAFS due to PSM-covered processes?

A2.6.3. Do support contractors provide adequate PSM training to their employees?

A2.7. PRE-STARTUP SAFETY REVIEWS.

A2.7.1. For any new or modified facilities affecting PSM information:

A2.7.1.1. Has a pre-startup safety review been conducted?

A2.7.1.2. Are safety, O&M, and emergency procedures in place and adequate prior to start-up?

A2.7.1.3. Has a PHA been performed and recommendations resolved prior to start-up?

A2.8. MECHANICAL INTEGRITY.

- A2.8.1. Is there a written mechanical integrity program for covered process equipment?
- A2.8.2. Are there adequate procedures for maintenance, inspection, and testing of process equipment?
- A2.8.3. Has adequate training been provided to employees maintaining process equipment?
- A2.8.4. Are inspection and test results properly documented?
- A2.8.5. Are deficiencies tracked and corrected in a timely manner?
- A2.8.6. Are new equipment, spare parts, and maintenance materials suitable for use in the covered process?

A2.9. HOT WORK PERMITS.

- A2.9.1. Are all hot work operations approved by the CCAFS Fire department via a hot work permit?
- A2.9.2. Do all hot work operations comply with the base hot work program requirements?

A2.10. MANAGEMENT OF CHANGE.

- A2.10.1. Are there written procedures for managing changes to covered processes?
- A2.10.2. Do these procedures:
 - A2.10.2.1. Assure impacts to safety and health are adequately reviewed and resolved?
 - A2.10.2.2. Assure operating procedures are properly updated?
- A2.10.3. Are employees involved in the process informed of the change and properly trained prior to startup?
- A2.10.4. Has all process safety information affected by the change been updated?

A2.11. INCIDENT INVESTIGATION.

- A2.11.1. Has each incident resulting in an actual or potential catastrophic release been investigated?
- A2.11.2. Are investigations initiated within 48 hours?
- A2.11.3. Do investigation teams contain the proper membership?
- A2.11.4. Is there a system developed to resolve and document findings and recommendations?
- A2.11.5. Are investigation reports properly reviewed and approved? Are they kept for 5 years?

A2.12. EMERGENCY PLANNING & RESPONSE.

- A2.12.1. Has an emergency action plan been established for your process/facility? Has it been coordinated with and is it compatible with the overall wing emergency response plan?
- A2.12.2. Does the plan include procedures for small releases?

A2.12.3. Is there a sufficient number of people designated and trained to assist in safe and orderly evacuation?

A2.12.4. Are there adequate alarm systems in place?

A2.12.5. Is the plan reviewed with each employee covered by the plan? Is it reviewed both initially and when changed?

A2.13. COMPLIANCE AUDITS.

A2.13.1. Are PSM compliance audits conducted at least every 3 years?

A2.13.2. Are the results documented and reported to both unit commanders and the PSM Team?

A2.13.3. Are findings formally tracked and closed out in a timely manner?

A2.13.4. Are audits conducted by people knowledgeable in the process?

A2.13.5. Have you, or the PSM Team, retained the two most recent audit reports?

A2.14. TRADE SECRETS.

A2.14.1. Has all necessary information been provided to those individuals responsible for the above elements without regard to possible trade secret issues?

A2.14.2. Do employees and their designated representatives have access to trade secret information contained in the PHA and other documents required by the PSM standard?

A2.14.3. - Have all trade secret issues been worked through the appropriate contract management office?