BY ORDER OF SECRETARY OF THE AIR FORCE

AIR FORCE OCCUPATIONAL SAFETY AND HEALTH STANDARD 91-25

1 FEBRUARY 1998

Safety

CONFINED SPACES

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Supersedes AFOSH Standard 91-25, 21 November 1994

Pages: 38

Distribution: F

The criteria in this standard are the Air Force's minimum safety, fire prevention, and occupational health requirements for confined spaces. Major commands (MAJCOM), direct reporting units (DRU), and field operating agencies (FOA) may supplement this standard when additional or more stringent safety, fire prevention, and health criteria are required. Refer to Air Force Instruction (AFI) 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, for instructions on processing supplements or variances. Report conflicts in guidance between this standard, federal standards, or other Air Force directives through MAJCOM, DRU, or FOA ground safety offices to Headquarters Air Force Safety Center, Ground Safety Division, Safety Engineering and Standards Branch (HQ AFSC/SEGS), 9700 Avenue G, SE, Suite 222, Kirtland AFB NM 87117-5670.

This standard applies to all US Air Force organizations, including all US Air Force Reserve personnel and when Air National Guard personnel are on federal service. It contains requirements for practices and procedures that provide protection for Air Force employees (military and civilian) who enter and work within confined spaces. This AFOSH standard implements Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.146, *Permit-Required Confined Spaces*. The use of this standard will minimize the potential for employee illness, injury, or death by ensuring confined spaces are evaluated for hazardous conditions and precautions are implemented to minimize or eliminate those conditions. This standard does not apply to tunnels specifically designed for human occupancy. All other Air Force operations or tasks that require entry into confined spaces will comply with the requirements in this standard. Specific procedures or technical orders (TO) which incorporate these requirements may be used for permit-required confined space entries.

SUMMARY OF REVISIONS

Administrative changes have been made to update this standard to electronic format. References have been updated, as appropriate. Contractor requirements (Chapter 7) have been updated. The sample AF Form 1024, **Confined Spaces Entry Permit** has been removed**.** Changes will be annotated by an asterisk (H). **NOTE:** AFOSH 127-series standards are being converted to 91-series standards and the 161-series to 48-series standards. However, not all standards have been converted as of the effective date of this stan-

dard. To help you locate these documents, references to AFOSH standards are stated in the updated series and standard number, with the outgoing series and standard number stated as “formerly designated as” in the references section of **Attachment 1.**

Chapter 1

HAZARDS AND HUMAN FACTORS

1.1. Hazards. Personnel entering or working in confined spaces may encounter a number of potentially serious hazards. These may include atmospheric hazards such as lack of sufficient oxygen to support life, excessive oxygen levels that increase the danger of fire or explosion, presence of flammable or explosive atmospheres and materials, or the presence of toxic gases or materials. In addition, the confined work space may include electrical or mechanical hazards that must be locked out, or engulfment or entrapment hazards. Many of these hazards are not readily apparent, detectable by odor, or visible, which may result in workers entering confined spaces without consideration of the potential dangers. Workers must consider that all confined spaces contain the most unfavorable and unsafe conditions and will not enter or work in these spaces until tests, evaluations, and prescribed requirements of this standard and locally developed procedures are performed to ensure safe conditions exist prior to entry and are maintained during the entire work period.

1.2. Human Factors. Human factors fall into two major categories: mental, such as attitude, emotion, job or domestic pressure, distractions, job knowledge, and hurrying; or physical, such as fatigue, physical strength, and reactions to prescription medications or drugs. These factors may affect workers who, by their commission (what they do) or by their omission (what they fail to do), can contribute to or even be the cause of a mishap. Some examples are:

1.2.1. Ignoring directions from entry supervisors.

1.2.2. Improper use of personal protective equipment (PPE) or tools while angry or distracted.

1.2.3. Being distracted from the job task while thinking about personal problems.

1.2.4. Not following established procedures or taking unauthorized shortcuts to save time.

1.2.5. Feeling drowsy or fatigued while performing job tasks caused by taking medically prescribed medications or improperly taking alcohol or illegal drugs.

1.2.6. Using equipment when not properly trained or qualified.

Chapter 2

RESPONSIBILITIES

2.1. Air Staff. All Air Staff elements will ensure policies and procedures are consistent with the spirit and intent of this standard.

2.2. Air Force Safety Center (HQ AFSC). Will:

2.2.1. Provide professional advice and guidance applicable to confined space programs in the realm of safety.

2.2.2. Act as approval authority for safety variances. **NOTE:** Requests for variances shall be processed through MAJCOM, DRU, or FOA ground safety offices.

2.3. Air Force Surgeon General (HQ AF/SG). Will provide professional advice and guidance applicable to confined space in the realm of sampling, analysis, and health risk appraisals and (or) hazard evaluations.

2.4. Air Force Civil Engineer Support Agency (HQ AFCESA/CEX). Will provide professional advice and guidance applicable to confined space in the realm of fire protection and emergency rescue.

2.5. Air Education and Training Command (HQ AETC) and Air Force Mate riel Command (HQ AFMC) Through United States Air Force School of Aerospace Medicine (USAFSAM).Will ensure all technical courses involved with confined space entry include in their curriculum, as a minimum, the training requirements identified in this standard.

2.6. Major Commands (MAJCOM), Direct Reporting Units (DRU), and Field Operating Agencies (FOA). Will provide program oversight and supplements, as necessary.

2.7. Installation Ground Safety (SEG). With assistance from the ground safety staff, the Chief of Ground Safety will:

2.7.1. Serve as the focal point for implementation of this standard.

2.7.2. Coordinate the installation confined space program.

2.7.3. Lead the installation Confined Space Program Team (CSPT).

2.7.4. Ensure the SEG representatives on the CSPT are trained in confined space requirements. Each individual shall attend a formal confined space course. If the person has not attended a formal confined space course, the chief of ground safety will ensure the person has adequate experience in confined space operations.

2.7.5. Maintain confined space records that are provided by the organization, whether located on or off the installation. Records will include a listing of all permit-required and non-permit confined spaces.

2.7.5.1. Verify all possible means have been employed in an effort to reduce the hazard classification of the space.

2.7.5.2. Verify organizational entry supervisors are trained, qualified, and experienced to authorize permit-required confined space entries.

2.7.5.3. Verify organizational procedures and confirm appropriate rescue teams and equipment are immediately available prior to planned entry.

2.7.6. Evaluate the effectiveness of unit procedures implemented to protect the entrants.

2.7.7. In conjunction with Bioenvironmental Engineering (BE) personnel, assist entry supervisors and functional managers in the selection of PPE.

2.7.8. Assist, as required, in training entry supervisors who issue entry permits and authorize entries into permit-required confined spaces.

2.7.9. When required, assist the functional manager in obtaining training for confined space entry team members.

2.7.10. When required, train organizational confined space entry members on the requirements contained in this AFOSH Standard.

2.7.11. Review and approve non-routine entry permits which are not contained in an organization master entry plan (MEP).

2.8. Installation Fire Chief (CEF). Will:

2.8.1. Provide rescue support for confined space entries according to local agreements.

2.8.2. Provide confined space entry rescue support to tenant units and contractors according to local support agreements.

2.8.3. Ensure the CEF representatives on the CSPT are trained in confined space requirements. Each individual shall have attended a formal confined space course. If the person has not attended a formal confined space course, the Fire Chief will ensure the person has adequate experience in confined space operations.

2.8.4. When requested, assist the functional manager in obtaining training for entrants, entry supervisors, and organizational rescue teams.

2.8.5. Assist in identification and selection of required equipment, to include PPE and self-contained breathing apparatus (SCBA), for organizational rescue teams.

2.8.6. Review and approve non-routine entry permits which are not contained in an organization MEP.

2.8.7. Evaluate confined spaces for flammable, explosive, or oxygen-enriched atmospheres when permitting entries that are not covered by an MEP.

2.8.8. Be a member of the CSPT.

2.9. Bioenvironmental Engineering (BE). Will:

2.9.1. When required by AFOSH Standard 48-1, *Respiratory Protection Program,* enroll all personnel who may enter confined spaces in the installation respiratory protection program.

2.9.2. Ensure the BE representatives on the CSPT are trained in confined space requirements. Each individual shall have attended a formal confined space course. If the person has not attended a formal

confined space course, the Chief of BE will ensure the person has adequate experience in confined space operations.

2.9.3. Provide local training on the use, calibration (user), and care of atmosphere testing and monitoring equipment. Certify organizational personnel, as required, to test confined spaces. If unable to support this requirement, the bioenvironmental engineer (BEE) should assist in identifying a training resource.

2.9.4. Document the location of each confined space in the appropriate case file with the information provided by the functional manager.

2.9.5. Review and approve non-routine entry permits which are not contained in an organization MEP.

2.9.6. Assist in training personnel for confined space duties.

2.9.7. Evaluate worker exposure to hazardous chemicals according to AFOSH Standard 48-8, *Controlling Exposure to Hazardous Materials.*

2.9.8. As the office of primary responsibility (OPR) for the installation respiratory program, assist in the selection of appropriate respiratory equipment and other PPE.

2.9.9. Assist functional managers and entry supervisors in the selection of proper PPE.

2.9.10. Assist entry supervisors in the interpretation of monitoring results.

2.9.11. If certified organizational personnel are not available:

2.9.11.1. Evaluate confined spaces for hazardous atmospheres and Immediately Dangerous to Life and Health (IDLH) conditions as necessary to meet mission requirements.

2.9.11.2. Sample the atmosphere in the confined space as often as may be required to ensure changing conditions do not result in unacceptable atmospheres.

2.9.12. Be a member of the CSPT.

2.10. Confined Space Program Team (CSPT). The primary purpose of the CSPT is to assist the functional managers and commanders in developing and administering confined space programs. The membership of the CSPT includes representatives of SEG, CEF, BE, and the functional manager, commander, or their designated representative. The CSPT will:

2.10.1. With the participation of the functional managers and commanders, assist in the identification, evaluation, and classification of all confined spaces. Identification may be done by type for a large number of confined spaces, such as manholes, pits, and undergound vaults.

2.10.2. Develop and provide a CSPT train-the-trainer program for entry supervisors. If limited resources prohibit the CSPT from providing this program, the CSPT will identify acceptable external training sources.

2.10.3. Assist in developing local controls and procedures for confined space entries.

2.10.4. Develop a MEP when requested by the functional manager or commander. The MEP, a part of the overall written confined space program will serve as approval for recurring entries having the same conditions and entry requirements when signed by representatives of SEG, CEF, and BE. The MEP allows functional managers and commanders to designate entry supervisors to issue entry per-

mits. Permits will not be issued when unexpected conditions exist that have not been anticipated or allowed for in the MEP, unless the condition can be eliminated or controlled. If hazardous conditions develop after entry that cannot be eliminated or controlled, the entry will be terminated, the permit revoked and retained for 1 year, and SEG, CEF, and BE staffs will be contacted before proceeding. The MEP will:

2.10.4.1. Describe the acceptable entry conditions, including acceptable atmospheric conditions, under which permits may be issued.

2.10.4.2. Designate as many entry supervisors as needed for the organization.

2.10.4.3. Identify the types and locations of spaces to be entered and the types of tasks or operations to be performed.

2.10.4.4. List either by reference or direct statement in the MEP the procedures to be used for entry (e.g. shop operating instructions [OI] that cover specific tasks).

2.10.4.5. Account for around-the-clock operations when appropriate.

2.10.4.6. List PPE, monitoring and rescue equipment, and conditions under which it will be used.

2.10.4.7. Designate frequency and type of atmospheric monitoring.

2.10.4.8. List other controls required (e.g., lockout and [or] tagout, ventilation).

2.10.4.9. List chemicals and quantities authorized for use. List expected exposure levels based on air sampling results.

2.10.4.10. List conditions under which the space may be reclassified as described in paragraph 6.4.11.

2.10.4.11. Provide procedures for amending the MEP.

2.10.4.12. Require verification of the condition of all monitoring equipment and PPE.

2.10.4.13. Be maintained by the entry supervisor.

2.10.4.14. Include provisions for entry during potential emergency situations.

2.10.4.15. Establish emergency rescue procedures for each permit-required confined space.

2.10.4.16. Establish communication procedures and identify communication equipment to be used during entries.

2.10.5. Determine atmospheric monitoring requirements.

2.10.6. Evaluate and approve MEPs.

2.10.7. Review the installation confined space program at least annually. The review will include a review of all MEPs and an assessment of training, rescue procedures, qualifications of entry supervisors, and a review of expired and (or) revoked entry permits.

2.10.8. Establish procedures with the contracting office to review all new construction projects to identify and record and classify confined spaces.

2.10.9. Permit the use of the AF Form 1024, ***Confined Spaces Entry Permit*** or may authorize the use of an automated product or letter format for the MEP. (See **Attachment 2** for instructions how to fill

out the AF Form 1024.) **NOTE*:*** MAJCOMs, DRUs, and FOAs may standardize MEP documentation to fit command needs.

2.10.10. Will, when possible, periodically monitor permit-required space entry operations.

2.11. Installation Level Organization. Each organization having tasks that require entry into confined spaces is responsible for its related portions of the confined space entry program, and accomplishes it through assistance from the CSPT.

2.12. Commanders and (or) Functional Managers . Will:

2.12.1. Ensure a written confined space program is developed. Serve as a member or designate a representative to the CSPT for management of confined spaces within the functional manager's control and assist in the development of the MEPs.

2.12.2. Ensure all personnel who are assigned duties and responsibilities that support the permit-required confined space program tasks are properly trained, equipped, and qualified and that the training is documented. (See chapter 5.)

2.12.3. Ensure required equipment is procured to support entry into confined spaces.

2.12.4. Ensure a current list of all confined spaces, both permit-required and non-permit, under the control of the organization or function, is maintained.

2.12.5. Provide a copy of the list of all confined spaces, permit-required and non-permit, to the host installation ground safety manager, fire chief, and bioenvironmental engineer.

2.12.6. Designate entry supervisors.

2.12.7. Review all non-permit confined spaces within their area of responsibility at least annually to ascertain that no changes occurred which would affect the original classification. If necessary, assistance may be obtained from the CSPT to reevaluate the confined space.

2.13. Entry (On-Site) Supervisor . Will:

2.13.1. Maintain the organizational MEP.

2.13.1.1. Issue entry permits consistent with the MEP.

2.13.1.2. Revoke the permit and contact SEG when any entry conditions are not consistent with the MEP.

2.13.2. Determine acceptable conditions are present at a permit space where entry is planned.

2.13.3. Ensure a qualified person (trained in the operation of direct-reading oxygen, flammability, and toxicity monitoring equipment) evaluates and classifies the confined space using the information in table 3.1.

2.13.4. Coordinate assistance from SEG, CEF, or BE officials, as required.

2.13.5. Ensure workers are properly trained and qualified in safe operating and emergency procedures, use of protective equipment, and how to egress. Ensure workers who are ill or are on medication that may affect their ability to safely perform assigned tasks, are excused from the operation. See paragraph 2.14.4.

2.13.6. Brief workers on the hazards of entry, i.e., chemicals that were in the tank, the effects of inhalation of vapors, and what safety and health hazards are inherent in cleaning or internal confined space operations, etc.

2.13.7. Inspect the work area, tools, and equipment to identify and correct hazards.

2.13.8. Select the appropriate PPE with help from SEG, CEF and BE personnel. Ensure the availability and use of all protective clothing and other PPE necessary for safe entry.

2.13.9. Ensure respiratory equipment is in safe operating condition and personnel are trained to understand the proper procedures for use.

2.13.10. Ensure all valves are isolated, locked out, and blinded or blanked to prevent anything from being accidentally pumped into the confined space.

2.13.11. Ensure all electrical power sources and equipment meet safety requirements for the atmosphere in the confined space. Also ensure all electrical power is de-energized and locked out.

2.13.12. Establish emergency procedures to rescue persons incapacitated in the confined spaces. These will include:

2.13.12.1. Ensuring the ready availability of rescue and safety-related equipment such as lifting or retrieval devices, respiratory equipment, and others necessary for the entry as determined by the permit system.

2.13.12.2. Ensuring there are adequate attachment points outside the confined space for tying-off or otherwise securing retrieval lines for all authorized entrants.

2.13.12.3. Providing an equivalent method for rescue when retrieval lines themselves may constitute an entanglement hazard or otherwise cannot be used.

2.13.12.4. Determining the availability of a rescue team. If the installation fire department is not available, verifying the availability of an organizational rescue team or other emergency rescue team. The operation will be halted if for some reason the primary rescue team becomes unavailable.

2.13.12.5. Ensuring the means (i.e., telephone, radio, etc.) for summoning the rescue team are operable, on hand, or easily accessible.

2.13.13. Be the last person to sign the permit after all conditions are met. If necessary, perform entrant or attendant duties when properly trained. Be permitted to transfer the duties of the entry supervisor to another qualified supervisor during the course of the entry operations and ensure that the new supervisor signs or initials the entry permit when the transfer is complete. If space on the permit is not adequate, maintain a list of names of workers as a separate document and attach them to the permit entry form. Ensure the entry permit is maintained at the site where the entry is planned. **NOTE:** The entry permit does not need to be posted.

2.13.14. Provide an attendant for each permit entry as required by this standard.

2.13.15. Provide appropriate vehicle and pedestrian guards, barriers, or other means to protect the entry party and attendants from local traffic hazards and to protect non-entering personnel from hazards arising from the confined space.

2.13.16. With assistance from SEG, CEF, or BE personnel, as appropriate, determine and evaluate the source (i.e., removal of residue from the space, repair of leaking valve or pipe in the space, etc.) of

any suspected atmospheric condition found at the time of entry. (Make appropriate provisions in case the severity of this hazard could increase while employees are in the space.)

2.13.17. Revoke the entry permit, terminate the entry, and secure the site when becoming aware of a prohibited or unexpected condition. Ensure a new entry permit is processed prior to reentry.

2.14. Confined Space Entrants . Will:

2.14.1. Fully understand all procedures, safeguards, and emergency egress and (or) rescue procedures associated with the entry.

2.14.2. Follow all safe work procedures required by supervisory personnel and SEG, CEF, and BE representatives.

2.14.3. Notify the entry supervisor when hazards exist that that have not been corrected.

2.14.4. Notify the entry supervisor if they are ill or on medication of any type.

2.15. Confined Space Attendants. Will:

2.15.1. Maintain an accurate accounting of entrants (who and number) in the permit space.

2.15.2. Remain outside the permit space and not attempt rescue involving entry until the rescue team has been notified and assistance has arrived. Make rescue efforts by means of the lifeline until assistance arrives.

2.15.3. Maintain continuous communication with all authorized entrants within the permit space by voice, radio, telephone, visual observation, or other equally effective means. **NOTE:** If it is not possible for one attendant to maintain communications with each entrant because of the entrant's work station in the space, the supervisor will make other arrangements to ensure the attendant is continuously aware of the location and condition of any entrant who is out of direct communication range.

2.15.4. Have authority to order entrants to exit the confined space at the first indication of a non-permitted condition, an unexpected hazard, indication of a toxic reaction (e.g., unusual conduct by the entrants), or if a situation occurs outside the space that could pose a hazard to the entrants.

2.15.5. Know the procedure and have the means to summon immediate emergency assistance if needed.

2.15.6. Remain at the attendant's post and not leave for any reason (except self-preservation) unless replaced by an equally qualified individual. Order the entrants to exit the space if the attendant must leave and there is no replacement.

2.15.7. Keep unauthorized persons from entering the permit space.

Chapter 3

GENERAL REQUIREMENTS

Essential regulatory requirements are contained in OSHA 29 CFR 1910.146. Portions of non-regulatory consensus standards, such as American National Standards Institute (ANSI) Z117.1, *Safety Requirement for Confined Spaces,* National Fire Protection Association (NFPA) standards, and applicable sections of existing AFOSH standards have been incorporated into this standard.

3.1. Confined Space Program Responsibility. The host installation SEG staff is responsible for coordinating the installation confined space program. Each organization having tasks that require entry into confined spaces is primarily responsible for its related portions of the confined space entry program. This responsibility is accomplished in close coordination with the CSPT (see chapter 2).

3.2. Identification of Confined Spaces. The functional manager or commander, in coordination with personnel on the CSPT, will identify, evaluate, and classify each confined space within the organization. If permit-required confined spaces are identified and workers and other employees may enter, the functional manager or commander will ensure a written confined space program consistent with the requirements of this standard is implemented. See the Permit-Required Confined Space Decision Flow Chart at **Attachment 3** for assistance in classifying confined spaces.

3.3. Initial Testing and Evaluation of Confined Space Conditions . Functional managers and entry supervisors, in coordination with the CSPT, must test for and evaluate many factors prior to classifying a confined or enclosed space. Such evaluations will include, but are not necessarily limited to, the following considerations:

3.3.1. The contents or previous contents of the space that may result in the presence of flammables, toxic materials, or oxygen-deficient or enriched atmospheres.

3.3.2. The location and configuration of the space, including restricted access, obstructions, remoteness, etc., which may inhibit or interfere with movement, ventilation, rescue efforts, or fire fighting efforts.

3.3.3. Potential hazards from the external environment, such as the proximity of liquid oxygen (LOX) storage operations, petroleum, oil, and lubricants (POL) storage areas, sewer and waste water treatment processes, and underground disposal sites, which could affect the atmosphere within the confined space.

3.3.4. The types of operations that are conducted within the space, particularly those which by the very nature of the process produce toxic materials, flammables, oxygen depletion or enrichment, or ignition sources.

3.3.5. Fixtures, devices, or equipment within the space that may create or contribute to hazardous conditions including piping systems, conduits, ducts, machinery, pressurized lines, etc.

3.3.6. The presence of other hazards such as slippery surfaces, deteriorated or unstable portable ladders, irritant or caustic materials, etc. Pay attention to the condition of permanently-installed ladders, such as those with metal rungs embedded into concrete walls of manholes or other structures.

3.3.7. The boundary spaces and their contents to ensure fire or explosion is not caused in these spaces by the operation being conducted.

3.3.8. Initial testing that shall be performed from outside the space. Testing into the interior of the space may be performed by drop tests or insertion of sample probes and hoses into the space. Testing will be performed in the following sequence:

3.3.8.1. Oxygen Content. Combustible gases are tested after tests for oxygen content because the threat of fire or explosion is more immediate and more life threatening, in most cases, than exposure to toxic gases and vapors.

3.3.8.2. Flammable Hazard. Many combustible gas indicators and (or) explosimeters require oxygen for proper operation (generally 10- to 30-percent oxygen by volume). Corrections for known flammable components, if different from the calibration gas, will be made according to the manufacturer's instructions.

3.3.8.3. Toxic Materials. For the determination of initial confined space classification, chemical substances known or expected to be present shall be measured and evaluated for their potential to produce a hazardous atmosphere (as defined in **Attachment 1**).

3.4. Classification of Confined Spaces . Confined spaces are classified on the basis of measurements of the oxygen content, flammability, and toxicity by testing (use table 3.1.). This table is based upon existing or potential confined space hazards. Confined spaces are also classified relative to material contained in the space that could cause engulfment or are configured in a manner that could result in entrapment and (or) asphyxiation. All personnel will assume confined spaces are permit-required until proven otherwise by means of testing and (or) inspection.

3.4.1. Permit-required confined spaces may contain hazards that present a situation that is IDLH or has a potential for or contains a hazardous atmosphere as defined in **Attachment 1**.

3.4.2. Non-permit confined space contains no hazardous atmosphere. The entrants will not perform any work that could cause a hazardous atmosphere. The space does not have a potential for engulfment and is not configured in a way that would cause entrapment or asphyxiation. (The use of special protective equipment and modified work procedures are not required by this standard, but may be required by other Air Force directives.) Permits and signs are not required.

3.5. Posting Signs . If there are confined spaces designated as permit-required and workers and other employees could inadvertently enter, the supervisor will ensure personnel are informed of the existence, location, and the danger of the permit space by posting danger signs. Use a sign stating "DANGER — PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" or a commercially available equivalent that conforms to the specifications and design established in AFOSH Standards 91-44, *Safety Color Coding, Labeling, and Marking for Piping Systems,* and 91-45, *Hazardous Energy Control and Mishap Prevention Signs and Tags.* Confined spaces where personnel cannot inadvertently enter, such as those protected by heavy manhole covers which require tools to remove, need not be posted.

3.6. Approved Equipment. Before purchasing equipment to support the confined space entry program, coordinate with the appropriate member of the CSPT. The supervisor will ensure testing and monitoring equipment used in confined spaces is approved for use in Class I, Division 1 and the appropriate group atmosphere, as defined in NFPA 70, *The National Electrical Code (NEC),* Article 500, *Hazardous (Clas-*

sified) Locations. Only direct reading equipment with current calibration will be used. The supervisor will also ensure equipment meets required standards of safety as determined by an appropriate Nationally Recognized Testing Laboratory (NRTL) as listed in the OSHA NRTL Program--Underwriters' Laboratories (UL), Factory Mutual Research Corporation (FMRC), etc. Group classifications are provided in NFPA 497M, *Manual for Classification of Gases, Vapors, and Dust for Electrical Equipment in Hazardous Locations.* Guidance is also provided in National Materials Advisory Board (NMAB) 353-5, *Classification of Gases, Liquids, and Volatile Solids Relative to Explosion-Proof Electrical Equipment.*

3.7. Testing of Confined Spaces . Testing, also called verification testing, will be accomplished prior to entry into permit-required confined spaces. This testing will be done by a qualified person who is trained and certified according to guidance in paragraph 5.6. Testing for classification of confined spaces is accomplished by a technically qualified professional member of the CSPT; normally the BEE.

3.8. Calibration of Monitoring Equipment. Monitoring equipment used to evaluate confined spaces shall be calibrated by Testing, Measurement, Diagnostic, and Evaluation (TMDE) Lab at an interval established by the TMDE technical orders or manufacturer's instructions. Some monitoring equipment (e.g., colorimetric tubes) does not require calibration. Equipment that comes with manufacturer-approved calibration devices and does not require TMDE calibration is also acceptable. Monitoring equipment that requires calibration, but cannot be calibrated by TMDE, shall be sent to the manufacturer for calibration. The user will field check equipment according to the manufacturer's instructions, immediately before testing the confined space. Workers will not use equipment that cannot be calibrated or which fails the field check, until it is repaired and the calibration and (or) field check is successfully accomplished.

3.9. Atmospheric Monitoring. Many operations may generate hazardous conditions and may require atmospheric monitoring as the work progresses to ensure safe conditions are maintained. The frequency and types of testing are dependent upon prevailing conditions and the nature of the operations. No single rule can be established for all operations and conditions. The entry supervisor, with assistance from the CSPT, shall establish the frequency and type of tests for atmospheric monitoring and shall enter these requirements on the MEP and the entry permit. The continuous monitoring of oxygen levels, flammable vapor levels, and toxicity levels should be considered for all permit-required confined space operations. The entry supervisor with appropriate assistance as stated above shall carefully evaluate the following types of operations for continuous atmospheric monitoring:

3.9.1. Work that has the potential of generating hazardous concentrations of toxic materials. (Examples: welding, cutting, brazing, soldering, etc.)

3.9.2. Application of preservatives, paints, epoxies, solvents, etc., which may involve hazardous concentrations of toxic or flammable vapors.

3.9.3. Cleaning operations, sludge removal, etc., which may produce or cause release of hazardous concentrations of toxic or flammable vapors.

3.9.4. Any similar operations that possess the potential for producing or releasing toxic, flammable, or asphyxiating atmospheres or material into the space.

Table 3.1. Confined Spaces Classification-Atmospheric Conditions.

PERMIT-REQUIRED	**NON-PERMIT**

PARAMETER	CONFINED SPACE	CONFINED SPACE
Characteristics	**Immediately dangerous to life or health (IDLH). Potential for or has contained a hazardous atmosphere.	No hazardous atmosphere with no creditable potential for a hazardous atmosphere, engulfment, or entrapment.
Oxygen	Less than 19.5 percent *(less than 148 mm Hg) or greater than 23.5 percent *(greater than 179 mm Hg).	19.5 percent - 23.5 percent- *148 - 179 mm Hg).
Flammability	Greater than 10 percent Lower Explosive Limit (LEL).	Less than or equal to 10 percent LEL.
Toxicity	An atmosphere concentration of any chemical substance over the occupational exposure limit (OEL) which is capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects.	An atmosphere concentration of any chemical substance, regardless of OEL, which is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects.

* Based upon a total atmospheric pressure of 760 mm Hg (sea level).

** Immediately Dangerous to Life or Health — as referenced in National Institute for Occupational Safety and Health (NIOSH), *Registry to Toxic and Chemical Substances,* Manufacturing Chemists data sheets, or other recognized authorities (see definition in **Attachment 1**)

Chapter 4

EMERGENCY AND RESCUE PROCEDURES

4.1. Responsibilities. The MEP will include emergency and rescue procedures consistent with the nature of each known operation that requires entry into a permit-required confined space. The entry supervisor will coordinate with the installation SEG, CEF, and BE staffs when required to enter non-routine permit-required confined spaces not included in the MEP and establish emergency rescue procedures prior to entry. Three means of rescue include self-rescue, a centrally located rescue team (installation fire department), and an organizational rescue team:

4.1.1. Self-Rescue**.** Employees are trained to exit from the confined space according to requirements in paragraph 5.2.3.

4.1.2. Centrally Located Rescue Team**.** According to local agreements, the installation fire department will normally provide rescue services for operations requiring entry into permit-required confined spaces on an Air Force installation. The supervisor in charge of entry into a confined space will contact the fire department prior to entering a permit-required confined space, to coordinate emergency rescue assistance and ensure its availability within a reasonable period of time. The entry supervisor will ensure these procedures are accomplished whenever emergency and rescue procedures are planned. When deemed appropriate by the fire chief the rescue team should stand by at the scene (such as entry into permit-required confined spaces that are IDLH. (See paragraph 5.5.1. for training requirements for rescue team members.)

4.1.3. Organizational Rescue Team**.** When confined space work is performed outside the installation or area for which the installation fire department has responsibility or the installation fire department is unable to support the operation, the supervisor in charge of entry will ensure an organizational rescue team is available or the confined space work is rescheduled. Organizational rescue teams shall consist of trained personnel equipped with appropriate PPE, including respiratory protection equipment necessary for entry into confined spaces, and with rescue and retrieval equipment suitable for the type of confined spaces involved.

4.1.3.1. Organizational rescue teams shall meet the same training requirements as entrants. In addition, the entry supervisor will ensure they are trained locally (if not in technical school) in the correct performance of the rescue functions assigned to them. Training, as a minimum, will include the use of retrieval and rescue equipment and proper wearing and use of any PPE, including airline respirators or SCBA approved for confined space rescue, that may be required during actual rescues. (See paragraph 5.5.)

4.1.3.2. In permit-required confined space operations, entry supervisors will ensure all members of the rescue team are cardiopulmonary resuscitation (CPR) trained. The organizational rescue team or installation fire department rescue team shall be available at the scene for permit-required confined space entry under IDLH conditions.

4.1.3.3. The appropriate CSPT member will assist as required in the selection of equipment for organizational rescue teams.

4.2. Inspection of Safety Equipment . Entry supervisors will ensure the inspection, testing, maintenance, and documentation of safety and rescue equipment are accomplished according to AFOSH Stan-

dard 91-31, *Personal Protective Equipment,* and TO 00-25-245, *Testing and Inspection Procedures for Personnel Safety and Rescue Equipment.*

Chapter 5

TRAINING

5.1. General Information. To ensure personnel are vigilant and well informed prior to entering a permit-required confined space, it is paramount that each organization develop a structured and effective training program to establish safe work practices and techniques. The persons developing this training program will base it on specific hazards to be encountered. The trainer will obtain installation SEG, CEF, and BE officials' approval on all training lesson plans prior to their use and any time changes are made to the plans. Entry supervisors will ensure all individuals (who are authorized confined space entry to perform confined space work or are assigned as attendants or rescue personnel) are trained. Entry supervisors will ensure employees are made aware of the appropriate procedures and controls for entry and that unauthorized entry into such spaces is forbidden. (Entry supervisors will ensure employees are made aware that the consequences of unauthorized entry can be fatal. Many hazards of confined spaces are impossible to detect without the use of specially designed equipment.) Refer to paragraph 5.7 for instructions how to document training.

5.2. Entrants. Entry supervisors will ensure all entrants are trained in the following subjects:

5.2.1. Hazard Recognition. Prior to entering a confined space containing a potentially hazardous environment, the nature of the hazard and the need to perform appropriate testing to determine if it is safe to enter.

5.2.2. Personal Protection Equipment (PPE). The proper use of all PPE and protective shields and barriers. See paragraph 2.9.1. for guidance to obtain respirator training.

5.2.3. Self-Rescue:

5.2.3.1. To exit from the confined space as rapidly as they can whenever an order to evacuate is given by the attendant, whenever an automatic evacuation alarm is activated, or whenever employees recognize the warning signs of exposure to substances whose presence in the confined space is known or expected.

5.2.3.2. To know the toxic effects or symptoms of exposure to anticipated hazardous materials they are using.

5.2.3.3. To relay an alarm to their attendant and to attempt self-rescue immediately on becoming aware of the effects discussed in paragraph 5.2.3.1.

5.2.4. Special Work Practices or Procedures. All modifications or alterations of normal work practices that are necessary for confined space work.

5.3. Entry Supervisor . The entry (on-site) supervisor in charge of the confined space entry and who authorizes entry into permit-required confined spaces will meet the training requirements of an entrant and be trained to accomplish the following:

5.3.1. Recognize the effects of exposure to hazards reasonably expected to be present.

5.3.2. Perform the duties and responsibilities outlined in paragraph 2.13.

5.4. Attendant . Entry supervisors will ensure the attendant is trained to perform the duties and responsibilities in paragraph 2.15. and on the same requirements as those of an entrant or rescue personnel if the attendant is expected to perform those functions.

5.5. Rescue:

5.5.1. All rescue team members, both organizational and installation fire department, shall receive hands-on practice in removing simulated victims (such as dummies, mannequins, or actual persons) from actual or representative confined spaces that have openings and portals like the types from which rescue is to be performed. This practice training will be conducted initially for each team member and at least once every 12 months thereafter, as long as the individual remains on the rescue team.

5.5.2. Entry supervisors will ensure all rescue team members are trained in all items listed in paragraph 5.2. for entrants, as well as: **NOTE:** The fire chief is responsible for the currency of the fire department's primary and secondary rescue teams' members. (See paragraph 2.8.3.)

5.5.2.1. Rescue duties and responsibilities.

5.5.2.2. Use of retrieval and rescue equipment.

5.5.2.3. Proper wear and use of PPE.

5.5.2.4. CPR and basic first-aid.

5.6. Confined Space Tester and (or) Monitor . The person designated to conduct tests of confined space atmospheric conditions must be trained in the operation, calibration, and care of the specific testing equipment to be used. The person conducting the tests must be fully trained and certified as qualified to interpret the results. The tester shall meet the training requirements of an entrant if entry is required to conduct the tests. See paragraph 2.9.3. for guidance in obtaining this training.

5.7. Documentation of Training. All confined space training for entry supervisors, entrants, attendants, testers and (or) monitors, and rescue team members shall be certified, documented, and kept up-to-date. The certification shall contain each individual's name and dates of training or retraining and either the initials or signature of the trainer and (or) instructor. Training shall be documented on an AF Form 55**, Employee Safety and Health Record**, for safety related items such as CPR or respirator use, or on an authorized computerized information management system. Training records will be available for review by the CSPT during annual program evaluations or spot checks.

Chapter 6

SPECIFIC REQUIREMENTS

6.1. Entry Into Confined Spaces . Entry supervisors will ensure workers enter a permit-required confined space ONLY after an AF Form 1024 (**Attachment 2**) or an approved entry permit which contains the minimum requirements of the AF permit has been obtained. The permit is an authorization and approval in writing that specifies the location and type of work to be done. It also certifies an evaluation of all existing hazards and the necessary protective measures have been taken to ensure the safety and health of each worker.

6.1.1. Rescue procedures and equipment are of paramount importance. Entrants will have an understanding of confined space entry and rescue requirements, and the entry supervisor will sign the entry permit as the person responsible for the entry.

6.1.2. Each completed entry permit, including those that are canceled or revoked, shall be retained for 1 year by the organization responsible for the entry and be available for review. Any problems encountered during an entry operation shall be noted on the permit so necessary revisions can be made to the confined space program (Refer to **Attachment 2** for instructions how to complete the Confined Space Entry Permit.) **CAUTION**: The permit is not valid unless the entry supervisor has signed it.

6.2. Testing and Classification of Confined Spaces . Testing and classification of confined spaces will be done by a qualified person who is trained and certified according to the requirements in paragraphs 5.6. and 5.7. Initial testing shall be performed from outside the space. Testing into the interior of the space may be performed by drop tests or insertion of sample probes and hoses into the space. Testing will be performed in the sequence outlined in paragraph 3.3.8.

6.3. Entry Into Known Immediately Dangerous to Life and Health (IDLH) Conditions Permit-Required Confined Spaces. Entry supervisors will not permit entry into and work in known IDLH spaces under normal operations. Entry supervisors will authorize entry only under the following circumstances:

6.3.1. Efforts are made to reduce the hazard within the confined space by isolation, ventilation, or other techniques to result in a lower classification confined space. If efforts to reduce the hazard to a lower classification confined space are unsuccessful, entry into known IDLH spaces is authorized only in cases of EXTREME EMERGENCY such as rescue efforts, emergency repairs, etc.

6.3.2. The permit for entry into known IDLH confined space is approved by the CSPT prior to space entry.

6.3.3. The permit authorizes entry into a specific confined space, for a specific purpose, by specific work crews, and for a work period, which will normally not exceed a single shift. If multiple shifts are necessary, either a new entry permit must be completed or the CSPT may approve a continuation of the initial permit with a new entry supervisor and crew members. Rescue team entry is exempt from this requirement.

6.3.4. Personnel entering confined spaces with known or estimated IDLH conditions will wear a positive pressure SCBA or a supplied-air respirator with escape SCBA (see AFOSH Standard 48-1). In addition, personnel will be equipped with a harness of a type suitable to permit extraction of the person (does not become a hindrance to the extraction), a lifeline securely attached to the harness, and

such other necessary PPE suitable for the conditions and exposures. **NOTE:** When the use of a life-line would present additional hazards, other alternatives must be considered.

6.3.5. Emergency rescue personnel, equipped with the above listed equipment and any additional equipment that may be necessary to effect a rescue, are stationed immediately outside the entry to the confined or enclosed space.

6.3.6. Communications by sight or voice or both are established and maintained between the person entering the space and attendant personnel outside the space.

6.3.7. Only explosion-proof or intrinsically safe equipment is used where flammable or explosive atmospheres are present. (Reference NFPA 70, Article 504, *Intrinsically Safe Systems***,** and Article 501, *Class I Locations.)*

6.3.8. A qualified ground safety official, as defined in AFI 91-301, is present during all known IDLH confined space entry and work periods. The ground safety official serves as a safety consultant to the person in charge of entry.

6.3.9. A qualified fire protection specialist is present during all known IDLH space entries when the atmosphere inside the space contains flammable or explosive contaminant or is oxygen enriched. **EXCEPTION**: If the installation fire department emergency rescue team is stationed on the scene, the fire protection specialist is not required.

6.4. Entry Into Permit-Required Confined Spaces. Permit-required confined spaces contain atmospheres or conditions that are, or may reasonably be expected to become, hazardous (but are not IDLH) (see table 3.1.). Flammables, toxic materials, or deviations of oxygen levels within a permit-required space may be due to the materials and conditions within the space or may be created by the operations conducted in the space. For routinely recurring work in permit-required confined spaces, see paragraph 6.4.10.

6.4.1. An entry permit for a specific task in a permit-required confined space must be approved by installation SEG, CEF, and BE personnel.

6.4.2. Permits, issued by an entry supervisor under a MEP, will permit entry into a specific confined space, for a specific purpose, by a specific work crew, for a period not to exceed a single shift or as determined jointly by the CSPT. Rescue team entry is exempt from this requirement.

6.4.3. Where the contaminations are caused by materials or conditions within the space, the entry supervisor will identify the cause or source of the contamination and remove it to the maximum degree possible by cleaning, ventilating, or other such treatments. See paragraph 2.12.4. for additional guidance when unexpected hazards develop.

6.4.4. Where the operations to be conducted within the space introduce (or have the potential to introduce) additional hazards within the space, the entry supervisor will ensure these hazardous conditions and operations are covered by the permit and take action consistent with the nature of the operations to control the hazards and maintain safe conditions within the space.

6.4.4.1. Where toxic materials are or may be introduced into the space, the entry supervisor will provide personnel within the space with NIOSH-approved respiratory protective equipment suitable for the exposure. The entry supervisor will contact the local BE staff for assistance in selecting the appropriate respiratory protective equipment and other PPE as determined necessary to protect against skin contact. See AFOSH Standard 48-1.

6.4.4.2. Entry supervisors will ensure that only explosion proof or intrinsically safe equipment is used where flammable or explosive atmospheres are present. (Reference NFPA 70, Articles 504 and 501.)

6.4.5. Entry supervisors will ensure personnel entering a permit-required confined space are suited with a harness and lifeline of a type suitable to permit extraction of the person (does not become a hindrance to the extraction) from the space. They will also ensure the lifeline is securely attached to the harness and adequate attachment points outside the confined space are available and used. **NOTE:** When the space is so configured that the use of a lifeline would present additional hazards, they will not be used.

6.4.6. The entry supervisor will identify and notify an emergency rescue team, the organizational or installation fire department, that the entry is in progress. **NOTE:** Entry will not be made until the emergency rescue team is notified and has verified their availability.

6.4.7. The entry supervisor will ensure an attendant is provided for all permit-required space entry and work. The entrants and attendant outside the space will establish and maintain communications. The attendant will know the procedure and have the capability to contact the rescue team or summon emergency assistance if the rescue team is not stationed immediately outside the confined space.

6.4.8. When initial testing indicates ventilation is required to remove detected contaminants and (or) provide adequate oxygen levels, the entry supervisor will ensure ventilation is provided during entry and occupancy of the space.

6.4.9. When operations to be conducted inside the confined space have the potential to cause an IDLH atmosphere without industrial ventilation, the entry supervisor will ensure ventilation (general dilution, or local exhaust) is used to maintain the atmosphere within the space.

6.4.10. For routinely recurring work in permit-required confined spaces (e.g., sewers, lateral fuel pits, dikes, communication vaults) where the spaces may be entered on a regular basis, a MEP may be developed and approved by SEG, CEF, and BE personnel. All master entry plans shall be reviewed by the above representatives and the organizational representative at least annually, to ensure conditions have not changed. Using the MEP as a guide, the entry supervisor will prepare an entry permit. The entry supervisor will authorize entry into the confined space by signature on the entry permit and will ensure the following conditions are met:

6.4.10.1. There is no known potential for an IDLH atmosphere or an engulfment.

6.4.10.2. The entrants are trained in routine recurring operations practices and procedures required for such entries.

6.4.10.3. The work operations are governed by TO, OI, or similar directive (e.g., AFI 32-1064, *Electrical Safe Practices).*

6.4.10.4. The space is tested for atmospheric hazards.

6.4.10.5. The permit is revoked whenever any testing required by this section shows conditions in the space are more hazardous than contemplated under the permit. The entry supervisor will stop operations and ensure a new permit is issued. Retain the revoked permit for 1 year. See paragraph 2.13.17.

6.4.10.6. The permit is revoked when any conditions of the permit are not followed or enforced.

6.4.11. The entry supervisor may reclassify a permit-required confined space to a non-permit confined space at the time of a specific entry. Such reclassification would allow entry without a permit, without personnel being suited with a harness and (or) a lifeline, and without an attendant, provided:

6.4.11.1. Testing is accomplished prior to entry with the results showing the space to be free of all hazards. **NOTE:** If entry is required to eliminate the hazards in the permit space, the entry must be made with an entry permit according to paragraph 6.4.1. Once the hazards have been eliminated, the space may be reclassified as non-permit as long as the hazards remain eliminated.

6.4.11.2. That actual or potential atmospheric hazards are eliminated, and continuous monitoring is used to ensure the atmosphere remains free of hazards. That all hazards within the space are eliminated without entering the space at the time of testing, and any non-atmospheric hazards remain eliminated.

6.4.11.3. That during routine work, the entrant does not take tools or introduce material into the space that could themselves cause a hazard.

6.4.11.4. The entrant does not perform any work that would cause a hazardous condition.

6.4.11.5. The entry permit is revoked whenever any test, monitoring instrument, or observation shows hazardous conditions are developing in the confined space more hazardous than allowed under the permit. When this occurs, the entry supervisor will secure the area and prevent entry until an approved entry permit is issued.

6.4.11.6. The entry supervisor documents the basis for the reclassification on a separate sheet, attaches it to the entry permit, and signs or initials next to the statement. See **Attachment 2. NOTE:** Routine or repetitive entries for daily inspections of lateral fuel pits are examples of work tasks that may qualify to use the procedures of this paragraph.

6.5. Entry Into Non-Permit Confined Spaces . These confined spaces are not considered hazardous and have no reasonable probabilities to become hazardous (see table 3.1.). These spaces are defined as confined because of design, may have limited openings for entry and exit, and may have limited space (lateral fuel pits under 5-feet deep, dikes less than 6 feet in height around fuel storage tanks).

6.5.1. Entries into non-permit confined spaces are allowed without an entry permit and require no attendants. **NOTE:** Even though the confined space is classified as a non-permit confined space, using typical criteria to evaluate hazards such as atmospheric, engulfment, or entrapment, the space may contain other physical hazards. Hazards such as slippery surfaces, or deteriorated pipe ladders, may make self-rescue difficult for the entrant. Also, fuel pits less than 5-feet deep with jet fuel accumulation due to line leak may present a hazard to repair crews. In cases where no entry permit is required, it may be appropriate for entrants to use a body harness to facilitate rescue operations in case of problems, for an attendant to be assigned to monitor the entry process, or other special procedures developed to protect entrants.

6.5.2. Non-permit confined spaces shall be reviewed periodically, at least annually, to ensure conditions have not changed which could result in a potential for hazards and a change in confined space classification. A non-permit confined space will be reevaluated any time a known change in mission occurs or new construction is planned which may affect the space or the area immediately adjacent to the space.

6.6. AF Form 592, USAF Welding, Cutting, and Brazing Permit. Whenever workers will perform hot riveting, welding, cutting or burning, or heating operations within a confined space, they will obtain an AF Form 592 from the installation fire department. (Refer to AFOSH Standard 91-5, *Welding, Cutting, and Brazing.*) If hazards may be introduced into the confined space due to the "hot work," the BEE should be contacted to evaluate the potential hazards and recommend ventilation procedures. In addition, the workers will:

6.6.1. Inspect, test, operate, and maintain welding and cutting equipment such as hoses, connections, torches, etc., according to the provisions of AFOSH Standard 91-5 and applicable TOs.

6.6.2. Not take compressed gas cylinders or gas manifolds used in welding and cutting operations into a confined space.

6.6.3. Turn off gas supplies at the cylinder or manifold outside the space when equipment is unattended or unused for substantial periods of time, such as at breaks or lunch periods. At shift changes (30 minutes or more) or overnight, turn off gas supplies and remove torches and hoses from the space. Immediately remove open-ended hoses from the space when torches or other devices are removed from the hose.

6.6.4. Not take electric arc units or machines into a confined space. Place such units outside the space.

Chapter 7

CONTRACTOR REQUIREMENTS

7.1. General. When an organization arranges to have a contractor perform work that involves a permit-required space entry, the organization shall:

7.1.1. Notify the contractor that work will be performed in a permit-required confined space and ensure the information is included in the statement of work (SOW) or equivalent contracting tool.

7.1.2. Review emergency rescue responsibilities to determine whether the contractor supplies rescue team or if the installation fire department is expected to supply a rescue function. Ensure the fire chief coordinates on the contract and either approves or disapproves the use of the rescue team if supplied by the installation fire department;

7.1.3. Brief the contractor on the contents of the space and known hazards that make the space permit-required;

7.1.4. Brief the contractor on precautions and procedures that have been implemented by the organization to protect Air Force workers;

7.2. Specific . Coordinate entry operations and procedures with the contractor and agree upon the permit space entry system to be used when both organizational and contractor personnel will be working in a permit-required confined space.

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Chief of Safety

Attachment 1

GLOSSARY OF REFERENCES, ABBREVIATIONS, ACRONYMS, AND TERMS

References

Air Force Instruction (AFI) 32-1064, *Electrical Safe Practices.*

AFI 91-301, *Air Force 0ccupational and Environmental Safety, Fire Protection, and Health Program.*

Air Force Occupational Safety and Health (AFOSH) Standard 48-1, *Respiratory Protection Program* (formerly designated as AFOSH Standard 161-1).

AFOSH Standard 48-8, *Controlling Exposures to Hazardous Materials* (formerly designated as AFOSH Standard 161-8).

AFOSH Standard 48-17, *Standardized Occupational Health Program* (formerly designated as AFOSH Standard 161-17).

AFOSH Standard 48-21, *Hazard Communication* (formerly designated as AFOSH Standard 161-21).

AFOSH Standard 91-5, *Welding, Cutting, and Brazing* (formerly designated as AFOSH Standard 127-5).

AFOSH Standard 91-31, *Personal Protective Equipment* (formerly designated as AFOSH Standard 127-31).

AFOSH Standard 91-44, *Safety Color Coding, Labeling, and Marking for Piping Systems* (formerly designated as AFOSH Standard 127-44).

AFOSH Standard 91-45, *Hazardous Energy Control and Mishap Prevention Signs and Tags* (formerly designated as AFOSH Standard 127-45.*)*

American National Standards Institute (ANSI) Standard Z117.1, *Safety Requirements for Confined Spaces.*

National Fire Protection Association (NFPA) Standard 70, *The National Electrical Code (NEC*): Article 500, *Hazardous (Classified) Locations;* Article 501, *Class I Locations*; and Article 504, *Intrinsically Safe Systems.*

NFPA Standard 497M, *Manual for Classification of Gases, Vapors, and Dust for Electrical Equipment in Hazardous Locations.*

National Institute for Occupational Safety and Health (NIOSH) *Registry to Toxic and Chemical Substances.*

National Materials Advisory Board (NMAB) 353-5, *Classification of Gases, Liquids, and Volatile Solids Relative to Explosion-Proof Electrical Equipment.*

Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.146, *Permit-Required Confined Space*.

Technical Order (TO) 00-25-245, *Testing and Inspection Procedures for Personnel Safety and Rescue Equipment.*

Abbreviations and Acronyms

AETC—Air Education and Training Command

AFCESA—Air Force Civil Engineer Support Agency

AFI—Air Force Instruction (new designation)

AFIA—Air Force Inspection Agency

AFMC—Air Force Materiel Command

AFOSH—Air Force Occupational Safety and Health

AFSC—Air Force Safety Center

ANSI—American National Standards Institute

BE—Bioenvironmental Engineering

BEE—Bioenvironmental Engineer

CEF—Fire Protection

CFR—Code of Federal Regulations

CPR—Cardiopulmonary Resuscitation

CSPT—Confined Space Program Team

DRU—Direct Reporting Unit

FMRC—Factory Mutual Research Corporation

FOA—Field Operating Agency

HQ—Headquarters

IDLH—Immediately Dangerous to Life and Health

LEL—Lower Explosive Limit

LFL—Lower Flammable Limit

LOX—Liquid Oxygen

MAJCOM—Major Command

MEP—Master Entry Plan

MSDS—Material Safety Data Sheets

NEC—National Electrical Code

NFPA—National Fire Protection Association

NIOSH—National Institute for Occupational Safety and Health

NMAB—National Materials Advisory Board

NRTL—Nationally Recognized Testing Laboratory

OEL—Occupational Exposure Limit

OI—Operating Instruction

OPR—Office of Primary Responsibility

OSHA—Occupational Safety and Health Administration

PDO—Publishing Distribution Office

POL—Petroleum, Oils, and Lubricants

PPE—Personal Protective Equipment

SCBA—Self-Contained Breathing Apparatus

SG—Surgeon General

SOW—Statement of Work

TMDE—Testing, Measurement, Diagnostic, and Evaluation

TO—Technical Order

UL—Underwriters' Laboratory

US—United States

USAFSAM—US Air Force School of Aerospace Medicine

WWW—World-Wide Web

Terms

Atmospheric Monitoring—The quantitative analysis of a confined space environment to identify a potentially hazardous atmosphere.

Attendant—A trained individual stationed outside one or more confined spaces who monitors authorized entrants and performs attendant's duties assigned in the permit space program.

Blanking or Blinding—The absolute closure of a pipe, line, or duct, by fastening across it a solid plate or cap capable of withstanding the maximum upstream pressure.

Calibration or Recalibration—A laboratory or bench-top resetting of alarm points, spans, and zeros according to manufacturer's specifications.

Confined Space Program Team (CSPT)—A group of professionals, consisting of representatives from installation ground safety, fire protection, and bioenvironmental engineering services, working together for the purposes of organizing and controlling the installation confined space program. Functional managers, commanders, or their representatives will become members of the team, when their particular organizations are involved.

Confined Space—A space that:

- Is large enough and configured so a worker can bodily enter and perform assigned work; and
- Has limited or restricted means for entry or exit (for example: tanks, vessels, silos, storage bins, hoppers, vaults, manholes, and pits are spaces that may have limited means of entry); and
- Is not designed for continuous human occupancy.

Double Block and Bleed—The isolation of a confined space from a line, duct, or pipe by locking or tagging two closed in-line valves and locking or tagging open to the outside atmosphere a drain or bleed in the line between the two closed valves.

Engulfment—The surrounding and overwhelming of a person by finely divided particulate matter or

liquid (for example: coal or fuel).

Entrant—Any employee who is trained and authorized to enter a confined space.

Entry Permit System—The system for ensuring safe entry into and work within confined spaces:

- **Entry.** Any action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the confined space.
- Entry Permit. The written authorization for entry under defined conditions into a confined space for a stated purpose during a specified time. See paragraph 6.1.2. for entry permit retention instructions.
- Entry Supervisor. The entry supervisor or crew chief responsible for determining if acceptable entry conditions are present at a permit space where entry is planned. This person is responsible for authorizing entry, overseeing entry operations, and for terminating entry if a change in conditions warrant. The entry supervisor will be the last person to sign the entry permit after all conditions are met. The entry supervisor may perform attendant or entrant duties if trained. The duties of the entry (on-site) supervisor may be transferred from one person to another during the course of the entry operation. This transfer of responsibility must be documented by either a signature or initials on the entry permit (see paragraph 2.15.13.).

Field Check—A method of checking an instrument for a proper response in the field. It is a functional check of the instrument and is a pass or fail or go or no-go check.

Functional Manager—The senior operating official at all levels exercising managerial control of an activity or operation. This individual usually can acquire and commit resources for the abatement of occupational safety and health hazards. Functional managers are designated by MAJCOM, DRU, FOA, or installation commanders.

Hazardous Atmosphere—An atmosphere presenting a potential for death, disablement, injury, or acute illness from one or more of the following causes:

- A flammable gas, vapor, or mist in excess of 10 percent of its lower explosive limit (LEL) or lower flammable limit (LFL);
- An airborne combustible dust at a concentration that meets or exceeds its LEL or LFL;
- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

An atmospheric concentration of any chemical substance greater than the occupational exposure limit (OEL) (according to AFOSH Standard 48-8), which is capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health affects. Routine exposures within a confined space to chemical substance which do not generate or have no potential of generating a hazardous atmosphere as defined here, will be controlled according to AFOSH Standard 48-8. **NOTE:** If a chemical substance does not have an OEL, other sources of information, such as Material Safety Data Sheets (MSDS), NIOSH documents, consensus standards, Air Force documents, etc., may be used to establish an acceptable atmospheric concentration, and

- Any other atmospheric condition that is immediately dangerous to life or health (IDLH).

Immediately Dangerous to Life or Health (IDLH)—Any condition that poses an immediate or delayed threat to life, that would cause immediate or delayed adverse health effects, or that would interfere with a worker's ability to escape unaided from a permit-required space.

Inerting—Rendering the atmosphere of a confined space non-flammable, non-explosive, or otherwise chemically nonreactive by displacing or diluting the original atmosphere with steam or a gas that is non-reactive with respect to the contents of the space. Nitrogen is a common inerting gas.

Isolation—Positively preventing any unwanted form of energy (or other agent with a serious potential for hazard) from entering the confined space through the use of blanking, double block and bleed, or lockout and (or) tagout.

Linebreaking—The intentional opening in a confined space of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, inert gas, or any fluid at a pressure or temperature capable of causing injury.

Lower Explosive Limit (LEL)—The lowest concentration of flammable or combustible vapor which can be ignited by a spark or flame. Also referred to as "Lower Flammable Limit" in industry.

Master Entry Plan (MEP—*)* A written document, which must be renewed annually, that authorizes entry supervisors to issue entry permits.

May—Indicates an acceptable or satisfactory method of accomplishment.

Non-Permit Confined Space—A space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazards capable of causing death or serious physical harm.

Occupational Exposure Limit (OEL—*)* The limit for the airborne concentration of a specified substance for a specified time. OELs apply only to occupational exposure to hazardous materials. BE personnel determine the appropriate OEL as described in AFOSH Standard 48-8.

Organizational Rescue Team—A group of two or more employees who are designated and trained to perform rescues from confined spaces.

Oxygen-Deficient Atmosphere—An atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen-Enriched Atmosphere—An atmosphere containing more than 23.5 percent oxygen by volume.

Permit-Required Confined Space—A confined space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfing the entrant;
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- Contains any other recognized serious safety or health hazard.

NOTES: Also see table 3.1.

Permit-Required Confined Space Program—The overall program that the organization has developed for controlling, and where appropriate, for protecting workers from permit space hazards and for regulating entries into permit spaces.

Prohibited Condition—Any set of conditions in a permit space where the hazard potential exceeds the limits authorized by the entry permit.

Qualified Person—A person who is trained to recognize the hazards of confined spaces and how to

evaluate those anticipated hazards. The qualified person may also be the entrant. Examples of qualified persons include: task-qualified ground safety, fire, and health personnel, personnel trained and certified to test confined spaces, permit issuing authorities, etc.

Shall—Indicates a mandatory requirement.

Should—Indicates a preferred method of accomplishment.

Retrieval Line—A line or rope secured at one end to a worker's full harness or wristlets, with the other end secured to a lifting or other retrieval device. The retrieval line will be used to remove an unconscious entrant from a confined space.

Welding, Cutting, and Brazing Permit (AF Form 592)—The written authorization to perform "hot work" operations such as riveting, welding, cutting or burning, or heating that could provide a source of ignition.

Will—Is also used to indicate a mandatory requirement and in addition is used to express a declaration of intent, probability, or determination.

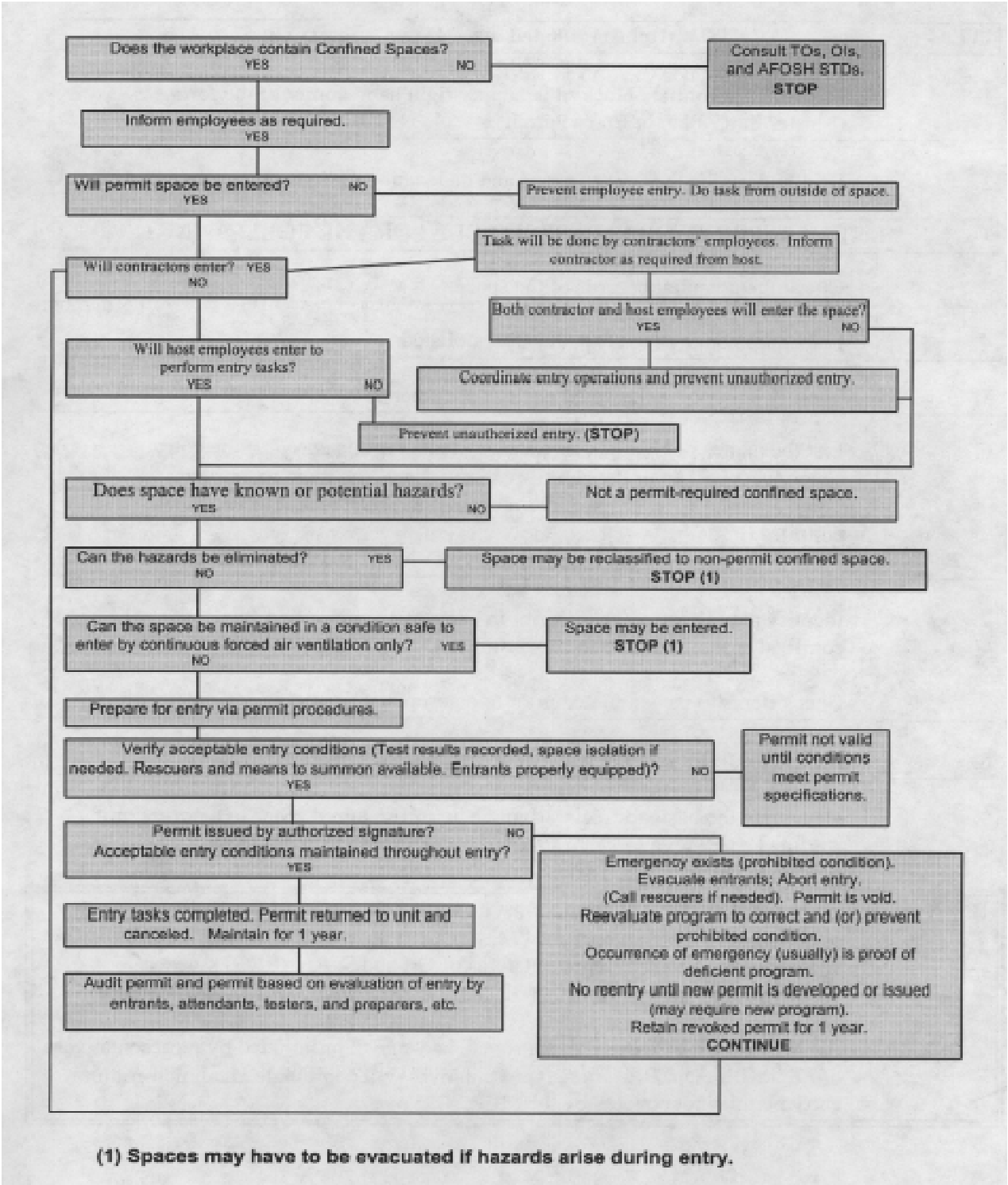
Attachment 2

INSTRUCTIONS FOR COMPLETING THE AF FORM 1024

ITEM	ENTRY (Items not listed are self-explanatory)
1.	Mark the appropriate block in the upper right hand corner of the form (Master Entry Plan or Entry Permit).
2.	Briefly describe the type of space and its location on or off the installation.
	ENTRY SUPERVISOR IS RESPONSIBLE FOR THE FOLLOWING:
3.	Check the potential hazards of the space.
4.	List equipment by type and add any not listed.
5.	Identify either organizational or fire department.
6.	List the names of all attendants and entrants for this entry. If the entry supervisors will enter the permit-required space, list them as entrants. Use a separate sheet to list additional entrants and attach it to the entry permit. **NOTE:** Entrants are not required to sign or initial next to their names.
7.	Identify required preparation prior to entering the permit-required confined space. Refer to the governing TO or OI when appropriate. Check items to be completed prior to entering the space.
8.	Ensure the tester is certified and current.
9.	Document the basis for reclassifying a permit-required space to a non-permit confined space on a separate sheet and attach it to the entry permit. The entry supervisor signs or initials next to the statement.
10.	To be valid, each entry permit must be signed by the Entry Supervisor. Entry permits issued from an approved Master Entry Plan (MEP) do not require the signatures or initials of representatives of Ground Safety (SEG), Bioenvironmental Engineering (BE), or the Fire Department (CEF). All MEPs must be reviewed, approved, and signed or initiated by representatives of SEG, CEF, and BE. These representatives will coordinate on all non-routine entry permits not covered by the MEP.

Attachment 3

PERMIT-REQUIRED CONFINED SPACE DECISION FLOW CHART



Attachment 4

CHECKLIST — CONFINED SPACES

This is not an all-inclusive checklist. The checklist provides a guide to aid in conducting a quality assessment of the installation confined space program. It is a self-inspection tool for functional managers to evaluate the elements of their confined space entry program. The CSPT may use the checklist to complete the annual confined space program evaluation. MAJCOMs, DRUs, FOAs, installation safety offices, and (or) supervisors will add to this checklist to include command or individual workplace-unique requirements or situations.

Responsibilities:

A4.1. Do the Chief of Ground Safety, the installation Fire Chief, and Bioenvironmental Engineering personnel comply with the duties and responsibilities contained in paragraphs 2.7., 2.8., and 2.9.? (Refer to paragraphs 2.7., 2.8., and 2.9.)

A4.2. Has the functional manager, in coordination with the CSPT, identified each confined space in the organization? Has each space been initially evaluated and classified by the CSPT? (Refer to paragraph 2.10.)

A4.3. Do persons, functional managers, and (or) entry supervisors, who authorize or are in charge of permit-required confined space entries:

A4.3.1. Ensure workers are properly trained and qualified in safe operating and emergency procedures, use of protective equipment, and egress? (Refer to paragraph 2.13.5.)

A4.3.2. Brief workers on the hazards of entry? (Refer to paragraph 2.13.6.)

A4.3.3. Inspect the work area, tools, and equipment to identify and correct hazards? (Refer to paragraph 2.13.7.)

A4.3.4. In a permit-required confined space where modification of work practices are required, ensure workers use all protective clothing and other PPE necessary for safe entry? (Refer to paragraphs 2.13.8. and 2.13.9.)

A4.3.5. Ensure all valves are isolated, locked out, and blinded or blanked to ensure no chemicals are accidentally pumped into the confined space? (Refer to paragraph 2.13.10.)

A4.3.6. Ensure all electrical power sources and equipment meet safety requirements for the atmosphere in the confined space? Also ensure all electrical power is de-energized and locked out? (Refer to paragraph 2.13.11.)

A4.3.7. Establish emergency procedures to rescue persons incapacitated in the confined space? If so, do they include:

A4.3.7.1. Ensuring the ready availability of rescue and safety related equipment? (Refer to paragraph 2.13.12.1.)

A4.3.7.2. Ensuring there are adequate attachment points outside the confined space for tying-off or otherwise securing retrieval lines for all authorized entrants? (Refer to paragraph 2.13.12.2.)

A4.3.7.3. Providing an equivalent method for rescue where retrieval lines themselves may constitute an entanglement hazard or otherwise cannot be used? (Refer to paragraph 2.13.12.3.)

A4.3.7.4. Determining the availability of a rescue team, and if the installation fire department is not available, verifying the availability of an organizational rescue team or other emergency rescue team? (Refer to paragraph 2.13.12.4.)

A4.3.7.5. Ensuring the means for summoning the rescue team are operable? (Refer to paragraph 2.13.12.5.)

A4.4. Does the entry (on-site) supervisor:

A4.4.1. Sign the permit indicating that all conditions for entry have been met? (Refer to paragraph 2.13.13.)

A4.4.2. Provide an attendant for each permit entry as required by this standard? Ensure the attendant is continuously aware of the location and condition of all entrants? (Refer to paragraph 2.13.14. and **NOTE** after paragraph 2.15.3.)

A4.4.3. Provide appropriate vehicle and pedestrian guards, barriers, or other means to protect entry party and attendants from local traffic hazards and to protect non-entering personnel from hazards arising from the confined space? (Refer to paragraph 2.13.15.)

A4.4.4. Determine and evaluate (with assistance from SEG, CEF, or BE personnel if required) the source of any suspected atmospheric conditions found at the time of entry? (Reference paragraph 2.13.16.)

A4.4.5. Terminate the entry upon becoming aware of a prohibited or unexpected condition? (Reference paragraph 2.13.17.)

A4.5. Do confined space entrants:

A4.5.1. Fully understand all procedures, safeguards, and emergency egress and (or) rescue procedures before signifying such understanding on the permit? (Refer to paragraph 2.14.1.)

A4.5.2. Follow all safe work procedures required by supervisory personnel and installation SEG, CEF, and BE representatives. (Refer to paragraph 2.14.2.)

A4.5.3. Notify the supervisor when hazards exist that have not been corrected? (Refer to paragraph 2.14.3.)

A4.6. Does the attendant:

A4.6.1. Know to remain outside the confined space and not attempt rescue involving entry until the rescue team has been notified and assistance has arrived? Make rescue efforts only by means of the lifeline until assistance arrives? (Refer to paragraph 2.15.2.)

A4.6.2. Maintain continuous communications with all authorized entrants within the permit entry confined space by voice, radio, telephone, visual observation, or other equally effective means? (Refer to paragraph 2.15.3.)

A4.6.3. Have authority to order entrants to exit the confined space at the first indication of a non-permitted condition, an unexpected hazard, indication of a toxic reaction, or if a situation occurs outside the space that could pose a hazard to the entrants? (Refer to paragraph 2.15.4.)

A4.6.4. Know the procedure and have the means to summon immediate emergency assistance if needed? (Refer to paragraph 2.15.5.)

A4.6.5. Remain at the attendant's post and not leave for any reason (except self-preservation) unless replaced by an equally qualified individual? Order entrants to exit if the attendant must leave and there's no replacement? (Refer to paragraph 2.15.6.)

A4.6.6. Warn unauthorized persons not to enter or to exit immediately if they have entered? (Refer to paragraph 2.15.7.)

Evaluation of Confined Space Hazards:

A4.7. Do all evaluations of confined space include:

A4.7.1. The contents or previous contents of the space which may result in the presence of flammables, toxic materials, or oxygen-deficient or enriched atmospheres? (Refer to paragraph 3.3.1.)

A4.7.2. The location and configuration of the space, including restricted access, obstructions, remoteness, etc., which may inhibit or interfere with movement, ventilation, rescue efforts, fire fighting efforts, etc.? (Refer to paragraph 3.3.2.)

A4.7.3. Potential hazards from the external environment which could affect the atmosphere within the confined space? (Refer to paragraph 3.3.3 .)

A4.7.4. The types of operations, particularly those which by their nature of the process produce toxic materials, flammables, oxygen depletion or enrichment, or ignition sources? (Refer to paragraph 3.3.4.)

A4.7.5. Fixtures, devices, or equipment within the space which may create or contribute to hazardous conditions including piping systems, conduits, ducts, machinery, or pressurized lines, etc.? (Refer to paragraph 3.3.5.)

A4.7.6. The presence of other hazards such as slippery surfaces, deteriorated or unstable ladders, irritants, or caustic materials? (Refer to paragraph 3.3.6.)

Classification of Confined Spaces:

A4.8. Are confined spaces classified on the basis of measurements of the oxygen content, flammability, and toxicity? (Reference paragraph 3.4.)

A4.9. Do entry supervisors ensure non-permit confined space entrants do not perform work that could create a hazardous atmosphere? (Refer to paragraph 3.4.2.)

Approved Equipment:

A4.10. Is testing and monitoring equipment used in confined spaces approved for use in Class I, Division 1 and the appropriate group atmospheres? Do workers ensure they only use direct reading equipment with current calibration? (Refer to paragraph 3.6.)

Atmospheric Monitoring:

A4.11. Does the entry supervisor, with assistance from the CSPT, establish the frequency and type of tests for atmospheric monitoring and enter these requirements on the entry permit? (Refer to paragraph 3.9.)

A4.12. Are the following types of operations carefully evaluated for continuous atmospheric monitoring?

A4.12.1. Work which has the potential of generating hazardous concentrations of toxic materials? (Refer to paragraph 3.9.1.)

A4.12.2. Application of preservatives, paints, epoxies, solvents, etc., which may involve hazardous concentrations of toxic or flammable vapors? (Refer to paragraph 3.9.2.)

A4.12.3. Cleaning operations, sludge removal, etc., which may produce or cause release of hazardous concentrations of toxic or flammable vapors? (Refer to paragraph 3.9.3.)

A4.12.4. Similar operations which possess the potential for producing or releasing toxic, flammable, or asphyxiating atmospheres or materials into the space? (Refer to paragraph 3.9.4.)

Emergency and Rescue Procedures:

A4.13. Does the entry supervisor have emergency and rescue procedures that are well planned and consistent with the nature of the operations and conditions within the confined space? (Refer to paragraph 4.1.)

A4.14. Are employees trained in self-rescue techniques (to exit from the confined space) according to requirements in paragraph 5.2.3. of this standard? (Refer to paragraphs 4.1.1. and 5.2.3.)

A4.15. Does the person in charge of entry into a confined space contact the fire department prior to entering a permit-required confined space, to coordinate emergency rescue assistance and ensure its availability within a reasonable period of time? (Refer to paragraph 4.1.2.)

A4.16. Where confined space work is performed outside of the installation or area for which the installation fire department has responsibility or the installation fire department is unable to support the operation, is an organizational rescue team available or the work rescheduled? (Refer to paragraph 4.1.3.)

A4.17. Are organizational rescue team members, if not trained in technical school, trained locally in the correct performance of the rescue functions assigned to them? (Refer to paragraph 4.1.3.1.)

A4.18. Is the inspection, testing, maintenance, and documentation of safety and rescue equipment accomplished according to requirements in AFOSH Standard 91-31 and TO 00-25-245? (Refer to paragraph 4.2.)

Training:

A4.19. Is the training program based on specific hazards to be encountered and given to all individuals who are authorized confined space entry to perform confined space work or assigned as attendants or rescue personnel? (Refer to paragraph 5.1.)

A4.20. Are employees made aware of the appropriate procedures and controls for entry and that unauthorized entry into such spaces is forbidden? (Refer to paragraph 5.1)

A4.21. Is each employee who is required to enter a confined space, trained in emergency procedures and have they received specific training covering the following subjects: (Refer to paragraphs 5.2.1. through 5.2.4.)

A4.21.1. Hazard Recognition?

A4.21.2. Personal Protective Equipment (PPE)?

A4.21.3. Self-Rescue?

A4.21.4. Special Work Practices or Procedures?

A4.22. In addition to meeting the training requirements of an entrant, is the person who authorizes confined space entry or who is in charge of confined space entry trained to: (Refer to paragraph 5.3.)

A4.22.1. Recognize the effects of exposure to hazards reasonably expected to be present? (Refer to paragraph 5.3.1.)

A4.22.2. Perform the duties and responsibilities outlined in paragraph 2.13. of this standard? (Refer to paragraph 5.3.2.)

A4.22.3. Are personnel who are required to perform duties as an attendant trained to perform the duties and responsibilities in paragraph 2.15. of this standard and on the same requirements as those of an entrant or rescue personnel? (Refer to paragraph 5.4.)

A4.23. Are persons, who conduct tests of confined spaces, trained on the specific equipment required to be used and how to interpret the results? (Refer to paragraph 5.6.)

Specific Requirements:

Entry Into Known IDLH Conditions Permit-Required Confined Spaces:

A4.24. Is entry into and work in permit-required confined spaces under IDLH conditions authorized only under the following conditions:

A4.24.1. When efforts are made to reduce the hazard within the confined space by isolation, ventilation, or other techniques to result in a lower classification confined space? (Refer to paragraph. 6.3.1.)

A4.24.2. If the efforts to reduce the hazard to a lower classification confined space are unsuccessful, authorized only in cases of EXTREME EMERGENCY such as rescue efforts, emergency repairs, etc.? (Refer to paragraph 6.3.1.)

A4.24.3. When the permit for entry into a permit-required confined space under IDLH conditions is approved by the CSPT prior to space entry? ***NOTE***: Rescue operations are exempt. (Refer to paragraph 6.3.2.)

A4.24.4. When the permit authorizes entry into a specific confined space, for a specific purpose, by a specific work crew, and for a period not to exceed a single shift or a time established by CSPT officials? (Refer to paragraph 6.3.3.)

A4.24.5. When personnel entering the space are equipped with an approved breathing apparatus, a harness of a type suitable to permit extraction of the person from the space, a lifeline securely attached to the harness, and such other necessary PPE suitable to the conditions and exposure? (Refer to paragraph 6.3.4.)

A4.24.6. When emergency rescue personnel, equipped with the above listed equipment and any additional equipment which maybe necessary to effect a rescue, are stationed immediately outside the entry to the confined or enclosed space? (Refer to paragraph 6.3.5.)

A4.24.7. When communications are established and maintained between the person entering the space and attendant personnel outside the space? (Refer to paragraph 6.3.6.)

Entry into Non-Permit Confined Spaces:

A4.25. Have appropriate reviews of conditions been conducted in each confined space to ensure no changes have occurred that would change the classification of the space? (Refer to paragraph 6.5.2.)

Welding, Cutting, and Brazing Permit (AF Form 592):

A4.26. Whenever workers will perform hot riveting, welding, cutting or burning, or heating operations within a confined space, do they obtain an AF Form 592, in addition to the entry permit? (Refer to paragraph 6.6.)