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Pressure Safety Criteria Review and Approach Document		
Authorization and Approval	 Kevin G. Kilp Deputy Director, Office of Environment, Safety and Health Assessments Date: November 20, 2019	 Charles C. Kreager Acting Director, Office of Worker Safety and Health Assessments Date: November 20, 2019

1.0 PURPOSE

The mission of the U.S. Department of Energy (DOE) Office of Environment, Safety and Health Assessments (EA-30) is to assess the effectiveness of safety and emergency management systems and practices used by line and contractor organizations and to provide clear, concise, rigorous, and independent evaluation reports of performance in protecting workers, the public, and the environment from the hazards associated with DOE activities.

In addition to the general independent oversight requirements and responsibilities specified in DOE Order 227.1A, *Independent Oversight Program*, this criteria and review approach document (CRAD), in part, fulfills the responsibility assigned to EA in DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, to conduct independent assessments of high consequence activities. This CRAD specifically relates to assessment of the pressure safety program under 10 CFR Part 851, *Worker Safety and Health Program*.

The CRADs are available to DOE line and contractor assessment personnel to aid them in developing effective DOE oversight, contractor self-assessment, and corrective action processes. The current revision of EA's CRADs are available at <http://www.energy.gov/ea/criteria-and-review-approach-documents>.

2.0 APPLICABILITY

The following CRAD is approved for use by the Office of Worker Safety and Health Assessments.

3.0 FEEDBACK

Comments and suggestions for improvements on this CRAD may be directed to the Director, Office of Environment, Safety and Health Assessments.

4.0 CRITERIA REVIEW AND APPROACH

The review of pressure safety systems will assess the effectiveness of programs and processes for establishment of a comprehensive pressure safety program in accordance with 10 CFR 851.24(b), *Functional areas* and Appendix A.4. *Pressure Safety*. The Integrated Safety Management Policy (ISMP), DOE P 450.4A, establishes the Department's policy for work to be conducted safely and efficiently and that ensures protection of workers, the public, and the environment. To achieve this, implementing Integrated Safety Management (ISM) requirements are established through directives, and for contractor organizations through contract clauses. This includes identification of existing and potential workplace hazards and assessment of risk, development and implementation of hazard controls, assurance that work is performed within established hazard controls, and implementation of a formal mechanism and process to gather feedback and implement continual improvement by the site contractor. The following objectives are designed as stand-alone sections to be used in any combination based on the need of the specific assessment.

OBJECTIVES

DOE.1: DOE field element provides oversight of contractor 10 CFR 851, *Worker Safety and Health Program*, pressure safety functional area program. (10 CFR 851.11(b) and (c))

Criterion:

1. DOE field element maintains sufficient technical capability and knowledge to review, provide direction, and recommend approval of the WSHP Pressure Safety program and oversee its implementation. (10 CFR 851.11(b) and (c); DOE Order 226.1B, 4.a.2.)

PS.1: Site Contractor has established a Worker Safety and Health Program that addresses safety policies and procedures to ensure that pressure systems are designed, fabricated, tested, inspected, maintained, repaired, and operated by trained and qualified personnel in accordance with applicable and sound engineering principles. (10 CFR 851.11(a)(3))

Criteria:

1. Contractor has developed a documented pressure safety program has established that adequately addresses regulatory and contract requirements. (10 CFR 850.24, Functional Area 4. (b)(1)-(3), Revised Technical Amendment)
2. Procedures for facility-related pressure vessels, boilers, air receivers, and supporting piping systems conform to appropriate codes and standards. (10 CFR 851.24, Functional Area 4.(b)(1)-(3); NFPA 45 and 55)
3. Procedures for research-related pressure vessels, boilers, air receivers and supporting piping systems conform to appropriate codes and standards. (10 CFR 851.24, Functional Area 4.(b)(2);

PS.2: Contractor maintains complete and accurate inventory records of pressure hazards. (10 CFR 851.26(a)(1))

PS.3: Site contractor has established procedures to provide equivalent protection and ensure a level of safety greater than or equal to the level of protection afforded by the American Society of Mechanical Engineers (ASME) or applicable state or local codes when national consensus codes are not applicable (equipment primarily used in laboratory scale and some full-scale research activities) because of pressure range, vessel geometry, use of special materials, etc. (10 CFR 851.24, Functional Area 4.(c).

Criteria:

1. Contractor has defined or has established a technical basis for when DOE pressure safety requirements (national consensus standards) are not applicable to pressure-related equipment because of pressure range, vessel geometry, use of special materials, etc. (10 CFR 851.24, Functional Area 4.(c).
2. The contractor organization/person responsible for a pressure equipment is clearly documented. (DOE P 450.2, Guiding Principle “Clear Roles and Responsibilities”)
3. Contractor has documented measures for providing equal or superior safety to intent of ASME code for each non-code compliant pressure system. Measures must meet the following criteria (10 CFR 851.24, Functional Area 4.(c)):
 - (a) Design drawings, sketches, and calculations must be reviewed and approved by an independent design professional engineer or by a documented organizational peer review. (10 CFR 851.24, Functional Area 4. (c)(1)
 - (b) Examinations and inspections of materials, in-process fabrications, use of non-destructive tests, and acceptance tests are established for each pressure system. (10 CFR 851.24, Functional Area 4.(c)(2)
 - (c) Documentation, traceability, and accountability must be maintained for each pressure vessel or system, including descriptions of design, pressure, testing, operation, repair, and maintenance. (10 CFR 851.24, Functional Area 4.(c)(3).
 - (d) Qualified personnel are used to perform examinations and inspections of materials, in-process fabrications, non-destructive tests, and acceptance tests. (10 CFR 851.24, Functional Area 4.(c)(2).

PS.3: Contractors train personnel working to design, approve, inspect, test, maintain, or use pressure equipment to ensure workers can perform their assigned duties and work in a safe and healthful manner. (10 CFR 851.25)

Criteria:

1. Contractor has established training appropriate to a worker's role (e.g., researcher, mechanic, designer, quality assurance) related to pressure systems. 10 CFR 851.24, Functional Area 4.(c)(2); 10 CFR 851.25(a) and (b)).
2. Contractor has documented workers have received training applicable to their roles in pressure safety equipment. (10 CFR 851.26(a)(1))

WP&C.1: Contractors use work planning and control (WP&C) procedures to conduct work on pressure systems (DOE P 450.4A1; DOE Contract requirements from DEAR 970.5223-1 Integration of Environment, Safety, and Health into Work Planning and Execution)

Criterion:

1. Contractor implements WP&C procedures to effectively identify and control pressure safety hazards. (DEAR 970.5223-1(c))

REVIEW APPROACH

Records Review:

- 10 CFR 851 *Worker Safety and Health Program* with Functional Area 4. Pressure Safety implementing procedures
- DOE review and approval documentation of contractor Worker Safety and Health Program
- Complete inventory of Research Laboratory Pressure Systems
- Pressure system documentation associated with each laboratory pressure system sampled (mix of high, medium and low hazard systems), to include but not limited to:
 - Pressure Permit
 - Design professional and their training records
 - Professional engineer approval documentation and training records
 - Specifications and drawings related to design, construction, inspection method and frequency and any required testing that demonstrates safety compared to ASME requirements
 - Records associated with establishment of testing and inspections protocols/frequency.
 - Training and qualification records for workers conducting testing and inspections.
- Samples of completed work packages (construction, maintenance, testing and or inspection) involving pressure hazards
- List of projected work on pressure systems during onsite review
- Assessment reports of the Pressure Safety Program during the past 5 years
- External assessment reports of the Pressure Safety Program during the past 5 years
- ORPS reports involving pressure systems during the past 5 years.

Interviews:

- Pressure Safety Program Manager
- Pressure System Owner (for laboratory pressure systems observed)
- Qualified Pressure System Inspector(s) and Tester(s)
- Contractor Assurance System Manager

Observations:

- Work involving sampling of pressure systems
- Selectively walk through of pressure systems
- Pressure Safety classroom training
- Pressure safety inspections or testing activities
- Meetings related to Pressure Safety Program or design and review of a pressure system