1.0 PURPOSE

Integrated Safety Management System (ISMS) activities are integrated into all planning and execution of work at Jefferson Lab. This procedure defines work processes and controls in the Jefferson Lab Environmental, Safety and Health (ES&H) Program, and Quality Assurance Plan (QAP) Section 5 – Work Processes. This procedure is required by DEAR 970.5223-1 Integration of Environmental Safety and Health into Work Planning and Execution.

This procedure outlines how Jefferson Lab implements its ISMS into the planning and execution of work. These steps include:

- Defining the Scope of Work
- Analyzing the hazards
- Developing and implementing hazard controls
- Performing work within controls
- Providing feedback and continuous improvement.

2.0 SCOPE

This process covers all work performed at Jefferson Lab. Each division/organization at Jefferson Lab also has defined work controls and processes tailored to their activities; however, all follow the same guidance as outlined in this procedure. See Figure 1 – Work Planning, Control and Authorization Flow Diagram provides a representation of how ISMS is implemented at Jefferson Lab.

All tasks at Jefferson Lab are evaluated for hazards prior to performing them and a determination of risk is assigned which dictates the relevant mitigating functions. A graded approach, commensurate with the risk code assigned, programmatic impact, and quality assurance is used to determine the level of rigor allotted for each activity.

NOTE: The significance of a hazard depends on the risk of the unacceptable outcomes it creates.

3.0 RESPONSIBILITIES

Each work group is responsible for performing planning, controlling, and authorizing work activities in accordance with this procedure. Qualified Work Control Coordinators (WCC) are assigned responsibilities to ensure the work authorization process is in place and performed in accordance with this procedure.

3.1 All Jefferson Staff

3.1.1 Identifies work to supervisor, or in accordance with other standard procedures.
3.1.2 Performs preliminary planning for assigned tasks.
3.1.3 Utilizes task lists as appropriate.
3.1.4 Ensures all documentation and approvals are obtained prior to performing work.
3.1.5 Analyzes the hazards prior to performing work.
3.1.6 Ensures training is adequate and appropriate for the work.
3.1.7 Ensures an approved WCD exists if required.
3.1.8 Monitors work during performance and re-evaluates the scope of work and task hazard analysis if appropriate.
3.1.9 Solicits and provides feedback for future reference.
3.1.10 Review lessons learned and promote continuous improvement to work.
3.1.11 Adequately documents lessons learned per group procedure.

3.2 WCD Author

3.2.1 Ensures all affected workers read, understand and sign associated documents.

3.3 Lead Worker

3.3.1 Performs pre-job safety briefing

4.0 PROCESS STEPS

4.1 Define the Scope of Work

4.1.1 Identify Task - provide an accurate detailed description of the work or service required include observed symptoms, conditions, suspected causes, hazards, and environmental concerns.

4.1.2 Perform Preliminary Planning – consider administrative, physical requirements, and include any precautions that should be followed. Steps are documented as appropriate to the group performing the work.

4.1.2.1 Review existing, previously approved, and/or current applicable TOSP, OSP, SOP (WCD), and Temporary Work Permits for the planned work or sub-tasks.
4.1.2.1.1 Determine if WCDs which address the scope of work can be utilized.
4.1.2.2 Identify potential hazards associated within the assigned

task.

4.1.2.3 Identify applicable Standard Protecting Measures, and the controls necessary to implement them.

4.1.2.4 Review lessons learned from similar tasks

4.1.2.5 Identify necessary and appropriate training requirements.

4.1.2.6 Determine required qualifications for the individual performing the task (qualifications commensurate with operations and hazards in the area) which may include:

4.1.2.6.1 On-the-job training (e.g., organization's work planning procedure, work permit development and implementation, pre-job briefings, etc.)

4.1.2.6.2 Demonstrated skill level (e.g., identification of hazards associated with planned work, hazard mitigation, activity planning and implementation)

4.1.2.6.3 Skill of the Craft (See Section 5.0 Definitions).

4.1.2.7 Define and ensure necessary resources are available.

4.1.2.8 Involve workers during planning as a resource. Consider::

- any special instructions,
- any special needs, or
- additional work start authorizations that may be applicable.

4.1.2.9 Allocate sufficient time to perform task.

4.1.3 Utilize Task List: as directed by affected group or when the task involves:

- Cross-divisional work.
- Multiple sub-tasks and/or many people.
- Affects other staff's safety or work space environment.
- Affects the operational status of work place systems (power, water, interlocks, alarms, etc.)

NOTE: Use of Task List – Task List can be used for all tasks.

NOTE: Task List may be supplemented with WCDs, engineering instructions, and other group procedures depending on the complexity of the work and the assigned Risk Code.

4.2 Analyze the Hazards – determine the associated Risk Code for work.

4.2.1 Inspect work area to identify possible additional hazards. Perform a pre-work walk-down of the area to identify possible hazards in addition to those previously identified.

4.2.2 Ensure the work is within the scope of understanding or norm.

4.2.2.1 Verify skill set and qualifications are defined and appropriate for the assigned task.

4.2.2.1.1 Involve SMEs and ESH&Q professionals when outside the scope of understanding or norm.

4.2.3 Verify that specified training is adequate for the work.

4.2.3.1 If additional training is required, identify adequately trained staff, or ensure required training is provided before the work is performed. (See Training and Development Office)

4.2.4 Complete an informal Evaluation of Risk for the planned work.

4.2.4.1 Assess Risk Code per ES&H Manual Chapter 3210 Hazard Identification and Characterization

4.2.4.2 Involve SME and ESH&Q professionals appropriately to identify the Risk Code.

4.2.5 Identify the Risk Code for the Task: The five Risk Codes associated with Jefferson Lab and how to define them can be found in ES&H Manual Chapter 3210 Hazard Identification and Characterization.

NOTE: Subcontractors complete a THA and/or Safety Plan in accordance with the Jefferson Lab bid package.

4.2.5.1 Risk Code $\leq$ 2 are considered Skill of the Craft:

4.2.5.1.1 For Risk Code =2 Jefferson Lab worker and supervisor meet to discuss associated hazards before the work begins. Then proceed to Section 4.4 – Perform Work within Controls.

4.2.5.1.2 For Risk Codes <2 proceed to Section 4.4 – Perform Work within Controls.

4.2.5.2 Risk Code > 2:

4.2.5.2.1 A formal Task Hazard Analysis and WCD are required.

EXCEPTION: a WCD is not necessary if the Risk Code can be reduced to ≤ 2 through the use of Standard Protecting Measures alone. If additional mitigation is needed a WCD is required.

4.3 Develop and Implement Hazard Controls

4.3.1 Determine if an approved WCD exists for the planned work. Have all affected workers read, understand, and sign (where appropriate) the associated WCDs prior to commencing work.

4.3.2 If a WCD is needed a formal Task Hazard Analysis is required in accordance with ES&H Manual Chapters 3210 Hazard Identification and Characterization, 3310 Work Control Documents, and 3320 Temporary Work Permits; and becomes a part thereof. These documents are then attached to any associated Task Lists. All necessary approvals are obtained before work is performed.

4.3.2.1 Have all affected workers read, understand, and sign (where appropriate) the associated WCDs prior to commencing work.

4.4 Perform Work within Controls.

4.4.1 Ensure all documents and approvals have been obtained prior to performing work.

4.4.2 Perform pre-job safety briefing(s) to review the precautions, pre-requisites, job hazards, and work coordination. Consider the following:

- What are the hazards associated with the work?
- Are they properly controlled?
- What are the critical steps to complete the work safely?
- What is the worst thing that can go wrong? And what to do about it.
- What actions are taken if new hazards are identified?
- Are there any lessons learned issues?

NOTE: Additional workers arriving on the job after the original

briefing must be briefed before they can start work.

4.4.3 If the authorized work is not progressing as planned or unforeseen hazards are identified re-evaluate the scope of work and THA. Review and rectify any discrepancies, up to and including ES&H Manual Chapter 3330 Stop Work Orders, beginning with Section 4.1 Define the Scope of Work.

4.5 Feedback and Continuous Improvement

4.5.1 Upon completion of the work, feedback is communicated in accordance with group procedures to convey any technical process information, safety reviews, efficiency issues, etc.

4.5.2 Areas or work practices are evaluated to determine if the feedback should be incorporated.

5.0 DEFINITIONS – are for the purposes of this procedure only.

ALARA – A Radiation Principle where workers plan their work so that their exposure level is As Low As Reasonably Achievable

Formal Evaluation of Risk or Formal Hazard Analysis: A Task Hazard Analysis formally document the process of evaluating pre-mitigated hazards and the potential outcome using risk codes as described in the ESH&Q Manual Chapter 3210 and associated appendices. (Task Hazard Analysis for Risk Code > 2 are documented and approved)

Graded Approach – Disciplined approach to determining the levels of analysis, management controls, documentation, and necessary actions commensurate with the Risk Code of an activity.

Hazard – Anything that could cause damage to an individual, property, or environment.

Informal Evaluation of Risks or informal **Task Hazard Analysis** – the process of evaluating pre-mitigated hazards and the potential outcome using risk codes as described in ESH&Q Manual Chapter 3210 and associated appendices (Informal Task Hazard Analysis for Risk Codes <2 do not need to be documented).

Risks Codes – The significance of a hazard is dependent on the risk of unacceptable outcomes it creates. Jefferson Lab has established and categorized five Risk Codes applicable for work activities. Risk Codes are based on the likelihood of an accident occurring for a given activity coupled with the severity of the

outcome. (Ref. ES&H Manual Chapter 3210 Hazard Identification and Characterization.)

Routine Tasks - are activities for which hazards have been previously identified, and mitigation measures are addressed in the ES&H Manual. They include common and non-hazardous activities. These are routine, recurring tasks such as maintenance, repairs, surveillances, etc. They are performed using the Task List and related procedures as appropriate.

Skill of the Craft – Term used to describe tasks that are routine and safely conducted by experienced staff who have been appropriately trained and working under Risk Code of $\leq$ 2 with or without Standard Protecting Measures

Standard Protecting Measures – a list of specific personnel protective equipment that is routinely used to reduce the risk codes to an acceptable level includes:

Basic PPE:

Hard Hat
Safety Glasses with side shields
Safety Shoes
Ear Protection
Face Shield
Gloves
Knee Pads
Proper Work Clothes

Engineered Safeguards currently in place and reviewed

Task List – Any work order, work tracking system, or document, used to define work.

Temporary Work Permit (TWP) – Work Permits which are authorized, approved, and have a limited life span (See: ES&H Manual 3320 Temporary Work Permits).

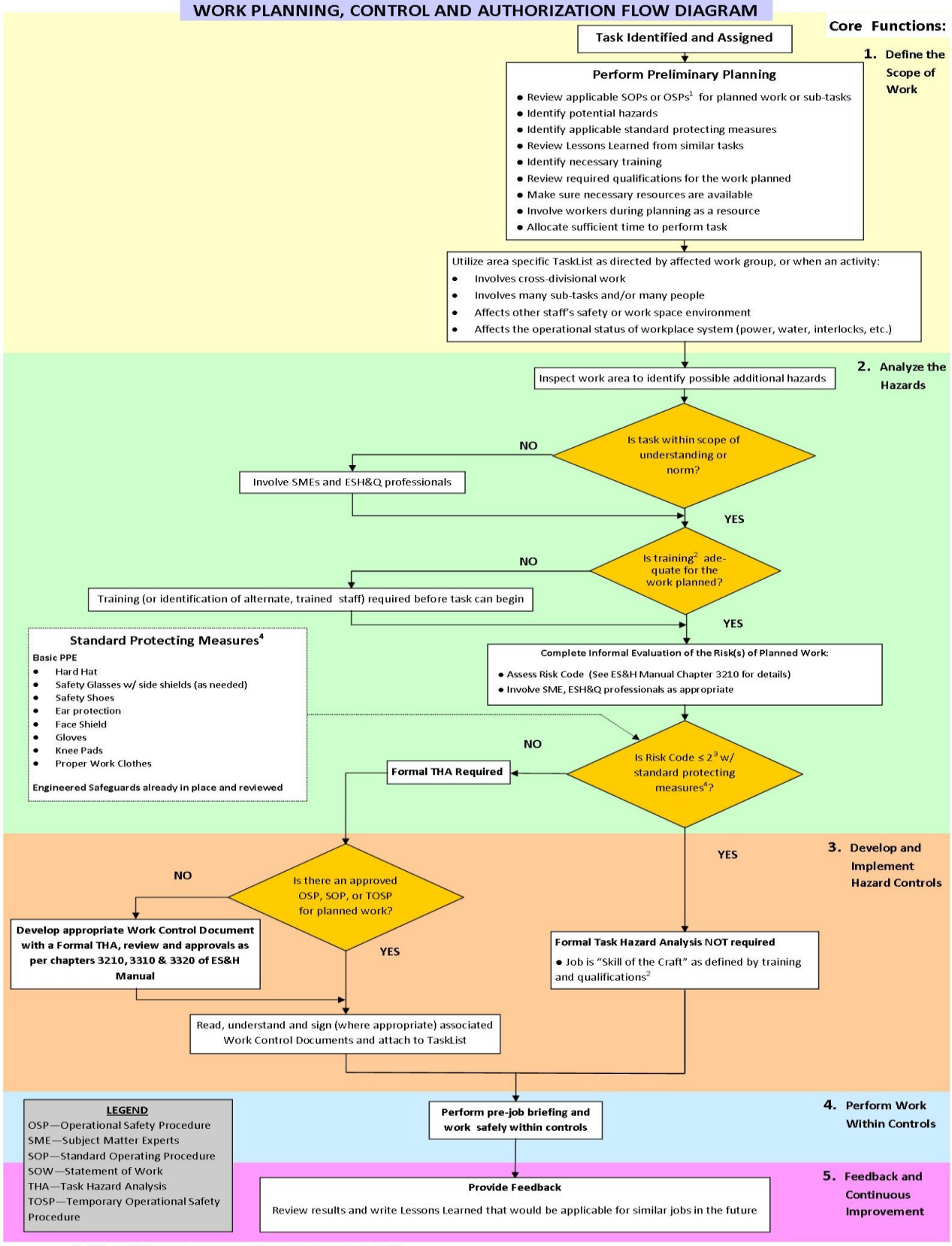
Training – Equipment specific, area specific, or functional/technical competencies

Unmitigated – No preventive features have been installed, or taken credit for, to terminate or relieve a hazard.

Work Control Document (WCD) – A formal controlled document as described in the ESH&Q Manual Chapter 3310 Work Control Documents (TOSP, OSP or SOP) or Jefferson Lab approved Subcontractor Safety Plan (e.g., used for large construction projects)

FIGURE 1 (Click here for Flow Diagram)

WORK PLANNING, CONTROL AND AUTHORIZATION FLOW DIAGRAM



1- OSPs and SOPs must be approved and current to be considered valid
2- Training = Equipment Specific, Area Specific or Functional or Technical Competencies
3- When RC =2, worker and supervisor will meet to discuss associated hazards before task can begin

05/19/08

6.0 REFERENCES

6.1 Jefferson Quality Assurance Plan
6.2 DOE Order 414.1C Quality Assurance
6.3 DOE P 450.4 Safety Management System Policy
6.4 ES&H Manual Chapter 3210 – Hazard Identification and Characterization.
6.5 ES&H Manual Chapter 3310 Work Control Documents and associated Appendices
6.6 ES&H Manual Chapter 3320 Temporary Work Permits
6.7 ES&H Manual Chapter 3330 Stop Work Orders
6.8 Jefferson Lab Lessons Learned
6.9 Jefferson Lab Training Management System
6.10 Construction Safety Subject Area
- **6.10.1** Jefferson Lab's 10 CFR 851 Worker Safety and Health Protection Program
- **6.10.2** ES&H Manual Chapter 3420 ESH&Q Aspects of procured Services and Construction
- **6.10.3** Facilities Management Division 1 Master Specification Section 01525, Safety and Health Requirements