



U.S. DEPARTMENT OF
ENERGY



Princeton Plasma Physics Laboratory

Integrated Safety Management (ISM) System Description

*[ISM is the Integrated Management of Environmental Protection, Safety,
Health, Physical Security, Cyber Security, and Emergency Management]*

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Director's Statement of Commitment to Integrated Safety Management

At the DOE Princeton Plasma Physics Laboratory, we advance the coupled fields of fusion energy and plasma physics. PPPL staff and collaborators together are developing the scientific understanding and key innovations needed to realize fusion as an energy source for the world, and are conducting research along the broad frontier of plasma science and technology. We also nurture and support the national research enterprise in these fields, and we educate the next generation of plasma and fusion scientists.

In pursuit of our mission, the Laboratory is committed to the application of the principles and functions of Integrated Safety Management (ISM.) These principles and functions have been very effective in their application to safety, health, and environmental sustainment and we have expanded their use to include the PPPL systems for safeguards and security, cyber security, and emergency management. As a result, these systems have achieved excellent results and they continue to mature and improve as ISM becomes evermore integrated with day-to-day work planning and practices.

This document describes PPPL's framework for integrating environmental sustainment, safety, health, physical security, cyber security and emergency management considerations into the management and performance of all Laboratory work activities. At the heart of the PPPL ISM system is the policy that responsibility for environment, safety, health, and security resides with each individual and every line manager. The Laboratory will continue to be committed to applying the principles, functions, and controls of ISM as described in this plan as we fulfill our responsibilities and commitments to each other, the University, the Department of Energy, and the public.

Stewart Prager, Director

I. Introduction

This document describes the structure and implementation of Integrated Safety Management (ISM) at Princeton Plasma Physics Laboratory (PPPL). ISM is implemented consistent with DOE policy, requirements, and guidance in a manner that applies controls and precautions tailored appropriately to the hazards of the projects and work being performed.

II. PPPL's Integrated Safety Policy and Philosophy

Integrated Safety Management (ISM) comprises:

- The governing policy (P-001) that safety be integrated into work management and work practices at all levels.
- The distinct policies, programs, plans, procedures, and cultural beliefs that we have developed as the structure that our managers and workers utilize in fulfilling our Laboratory's ISM responsibilities in the planning and performance of their jobs.

ISM is a socially responsible philosophy that is inherent to our Laboratory's primary programmatic mission – develop the scientific understanding and the key innovations that will lead to an attractive fusion energy source.

The Department of Energy (DOE) by contract requires Princeton to provide a place of employment that meets the worker safety and health requirements of 10 CFR Part 851 and is integrated with its ISM system. In addition, DOE contractually requires integrating environment, safety and health into work planning and execution, and integration of the Laboratory's Contractor Assurance System with Integrated Safety Management. The PPPL ES&H Program was built on these concepts and includes well-established safety policies, procedures and practices that have helped our workers successfully implement ISM.

The first three components of the DOE ISM Policy (Objective, Guiding Principles, and Core Functions) are described in Figure 1. Component 2 identifies seven "Guiding Principles" that are to be followed while applying the other components of ISM. Component 3 provides five safety management "Core Functions" as the steps that must be taken to attain the ISM "Objective" of integrated safety.

Figure 1

Intent and Essential Elements of ISM

- 1 Objective - Integrate safety into management and work practices.** [To ensure missions are accomplished while protecting the public, workers, and the environment.]

- 2 Guiding Principles** [The principles to be followed in the establishment and performance of the core functions (3) to accomplish Objective (1).]
 - **Line Management Responsibility for Safety**
 - **Clear Roles and Responsibilities**
 - **Competence Commensurate with Responsibilities**
 - **Balanced Priorities**
 - **Identification of Safety Standards and Requirements**
 - **Hazard Controls Tailored to Work Being Performed**
 - **Operations Authorization**

- 3 Core Functions** [The five functions that must be applied, on a graded approach, to any work activity.]
 - **Define the Scope of Work**
 - **Analyze the Hazards**
 - **Develop and Implement Hazard Controls**
 - **Perform Work within Controls**
 - **Provide Feedback and Continuous Improvement**

The final three components of ISM (Mechanisms, Responsibilities, and Implementation) are discussed in Figure 2, and are tailored to the work conducted at PPPL. This document describes how the Mechanisms, Responsibilities, and Implementation components of ISM are implemented at PPPL.

Figure 2

PPPL's Implementation of ISM

- 4 Mechanisms** [Define how the Core Functions are applied at PPPL based on the specific activities being performed, the associated hazards and work, and the DOE expectations.]
- **DOE Expectations for How the Core functions are to be performed** are conveyed to PPPL through DOE Directives and contract clauses.
 - **PPPL policies, procedures and documents** [such as ES&H plans, safety assessment documents and hazard analyses] outline how PPPL implements the ISM Core Functions and Principles, and fulfills commitments made to DOE, and DOE Expectations.
- 5 Responsibilities are incorporated into the PPPL "Mechanisms"**
- **PPPL Responsibilities** are defined in our contract, regulations, and PPPL procedures.
 - **PPPL Approval Authorities** for employing the ISM Principles and Core Functions have been established by Lab Policies and Procedures, applying a risk-based graded approach.
 - **DOE responsibilities** are defined in DOE Directives.
- 6 Implementation of ISM at PPPL**
- **Implementing the Mechanisms** is accomplished by applying the PPPL Procedures, Plans, and Policies to individual work activities and projects on a risk-based graded approach.

III. PPPL's Implementation of Integrated Safety Management

Implementation of ISM at PPPL begins at the Institutional or Lab-wide level by:

- 1) Identifying the governing requirements, customer expectations, and responsibilities that must be fulfilled in the management and operation of Laboratory activities. This step results in the "umbrella" of standards encompassing Laboratory activities that include applicable DOE Directives, laws, regulations, contractual requirements, and industry standards.
- 2) Developing Laboratory policies, plans, and procedures, based on the "umbrella" of governing requirements and expectations, to guide work activities and ensure responsibilities and commitments are met.

While the establishment of the regulatory framework and implementing documents is performed at the institutional level, the integration of safety and environmental considerations into management and work is also performed at the facility or project levels, and specific to each work activity being performed.

Whether at the institutional, project, or activity level, the main focus of ISM is that all work be performed safely, and this is accomplished by applying the "Core Functions" of ISM to all work:

1. Define the Scope of Work
2. Analyze the Hazards
3. Develop and Implement Hazard Controls
4. Perform Work within Controls
5. Provide Feedback and Continuous Improvement

The core functions are integrated into Lab-wide, Department, Project, and work group policies, plans, engineering standards and procedures, which are developed by knowledgeable subject-matter experts, reviewed by the management of the impacted Departments as well as workers, and approved by senior management (for Lab-wide requirements) or the appropriate Department management (for project or Department specific requirements). Laboratory staff and other individuals who work at PPPL are trained with and expected to be familiar with the established systems and documents. Attachment 1 shows applicable Lab-wide policies, plans, procedures, and manuals along with the

corresponding ISM "guiding principles" and "core functions". Specific procedures developed by individual projects (e.g., procedure OP-AD-09 which details the requirements for obtaining a permit to perform work on the D-Site experimental facilities) also become part of the overall integrated safety management system for that project.

Integrated Relationship of ES&H Systems Within Core Functions

The chart below illustrates for each of the five Core Functions the flow down of the PPPL Management processes from Lab wide policies, processes and requirements to the Department/Process level management procedures and requirements down to the activity level work controls. For each Core Function, a representative sample of Mechanisms is listed.

Core Function	Lab Level	Department/Project Level	Activity Level
1. Define the Scope of Work	Prime Contract with DOE, Field Work Proposals, PPPL Laboratory Plans, Statement Of Work, (NEPA) review process, Conduct of Operations Procedure, Cyber Security Program, Environmental Management Systems, Radiation Protection Program	Work Planning System, Project Charter, Design Review Meetings	JHA, Permitting Process, Job Specific Training Sessions
2. Analyze the Hazards	Lab Procedures, ES&HD 5008 Section 11 Operations Hazards Criteria and Safety Certification, Radiological ALARA Plan	Department Procedures, Work Planning Procedures, Training, Permit Applications, Conduct of Operations Procedure, MSDS Online, Environmental Assessments, Safety Certificates, Experiment Run Assessments	JHA, Environmental Monitoring Plan, Root Cause Analyses, Incident Investigations

<p>3. Develop and Implement Hazard Controls</p>	<p>Lab wide Permit Procedures, Training, ES&H Executive Board Subcommittees, Site Sustainability Plan</p>	<p>Access and Safeing Procedures, Training and Qualifications, PPPL Work Planning Procedure</p>	<p>JHA, RCA, Permitting Processes, Project Procedures, Pre-job Briefings, PPPL Work Planning Procedure</p>
<p>4. Perform Work within Controls</p>	<p>Line Manager/ES&H Oversight, DuPont STOP™ Program</p>	<p>Line Manager/PTR Oversight, Employee Qualifications, Management Walkthroughs, Self-assessments</p>	<p>JHA, Training, Hazardous Work Permits, Conduct of Operations Procedure, Job Specific Training Sessions</p>
<p>5. Provide Feedback and Continuous Improvement</p>	<p>Lessons Learned, Work Planning Reviews, Tracking and Trending, Peer Reviews, Safety Forum, ES&H News Letters, Emergency Response Drills</p>	<p>Daily Tailgate Meetings, Post Job Briefs, Audits, Facility Walkthrough Inspections</p>	<p>JHA reviews , Experiment Run Assessments, Post Job Briefs, DuPont STOP™ Program</p>

PPPL Integrated Safety Management Processes, Programs, and Systems

DOE provides their expectations and requirements for PPPL in the form of Directives, contract clauses, funding directives and performance objectives. In addition, DOE contractually requires integration of environmental programs into Integrated Safety Management Systems as part of the Contractor Assurance System. The PPPL policies, procedures, and documents (ISM mechanisms) listed in Attachment 1 show how PPPL meets those DOE expectations and requirements by implementing the Principles and Core Functions of ISM (see Figure 2).

PPPL's commitment to strong ES&H programs, the importance of protecting the environment and the safety of workers and the public, and the belief in line management responsibility for achieving these objectives are illustrated prominently in Laboratory policies and procedures, are fully integrated into PPPL work planning and control systems, and are well understood by all employees. Laboratory policies P-002 *Environmental*

Stewardship and P-003 *Environment, Safety, and Health Policy*, signed by the Laboratory Director, clearly state the Laboratory's commitment to the principles of integrated safety management and describe the goals of PPPL's ES&H programs. Management assessments, including Management Safety Walkthroughs and quarterly senior Laboratory Management Reviews, regularly assess the performance of organizations and functions in order to determine how well and efficiently objectives, goals and safety criteria are being met.

Laboratory plans that set institutional level goals, objectives, and controls include Environmental Monitoring Plan, Environmental Management System (EMS), Site Sustainability Plan (SSP), Radiological ALARA Plan, Radiation Protection Program, General Plant Project (GPP) Prioritization, Worker Safety and Health Program, and the Assurance System Description. Institutional committees comprised of senior and line management are well established and include the ES&H Executive Board, the Safety Review Committee, the Environmental Review Committee, the Cyber Security Policy Review Board, the ALARA Review Committee, and the Technical Resources Committee. In addition, two new committees have been chartered, the Safety Champions Committee and the Lithium Experts Committee. These committees have intimate awareness and involvement with ES&H and security issues that have potentially broad Laboratory impacts. These committees provide resources able to investigate concerns, define training requirements and provide technical assistance to establish procedures, policies and controls to ensure ISM implementation in new and proposed Lab programs and exposures.

The National Environmental Protection Act (NEPA) review process (PPPL ESH-014) is a cornerstone of the integrated safety and environmental sustainment program that ensures line management, line workers, and independent safety professionals have thoroughly reviewed proposed activities, analyzed the associated hazards and potential environmental impacts, and developed appropriate controls. Over the years, the PPPL NEPA process has evolved and has been recognized by DOE for its effectiveness and method of application. The safety analysis and review system has been folded into the NEPA process so that reviews include all safety and health issues in addition to environmental impacts. NEPA reviews incorporate activities at all levels including major projects and limited scope work activities. The need for careful planning and review of activities is ingrained in the work force and management. NEPA review activities are invoked during the initial stages of projects, prior to project modifications, and during routine work planning. The NEPA process is covered in General Employee Training (GET), which also introduces employees and other workers to the tenets of line management responsibility and individual worker

responsibility for ES&H. These tenets are emphasized continually at management talks, design review meetings, and job specific training sessions.

PPPL also employs a comprehensive Job Hazard Analysis (JHA) procedure. The JHA form is extensively used as a tool for workers and supervisors to identify and control hazards for work being performed at the Laboratory, and to review them at pre-job briefings prior to starting work. Hazards Awareness Training, designed around the Job Hazard Analysis procedure and form, educates staff on the hazards commonly found at PPPL and how to mitigate them effectively. Virtually all PPPL staff have now received this training, and the training is being provided to new employees and new graduate students as well.

Work planning and control aspects of ISM begin with the proposal of a project, facility modification, or specific work scope tasks. Proposed activities are identified, reviewed, prioritized, and scheduled using work planning forms, work authorizations, field work proposals, work orders, GPP proposals, and design change proposals. Safety reviews and oversight are integrated into these schedules and activity budgets. These methods of work proposal and authorization trigger the NEPA review process and related ES&H activities. General Plant Projects undergo review by the Technical Resources Committee and are prioritized in accordance with Capital Asset Management Process (CAMP) risk criteria. Detailed reviews of the ES&H aspects of the work are performed that include identification, analyses, and categorization of the hazards according to DOE Order guidance and Laboratory and project procedures.

These reviews and analyses result in one or more of the following: documented Environmental Assessments, permit applications, NEPA forms and approvals, safety assessment documents (SADs), work planning form approvals, safety certifications, and ultimately, Job Hazard Analyses. Depending on the hazard levels, operating procedures are developed, design reviews are conducted, and conduct of operations plans are developed to specify administrative controls, security precautions, safety controls, safety programs, environmental sustainment measures and other conditions for the work. Work packages, job procedures, maintenance and work plans, and "safety envelopes" can also be developed. Appropriate input from multiple disciplines of line management and line workers is an essential part of the review and development of these documents and controls. The PPPL Work Planning Procedure has matured as a tool for guiding the accountable individuals through ES&H and technical requirements and reviews. The Work Planning form clearly assigns responsibility for the planning of the work and is used to attain authorization from

the line manager who has ultimate responsibility for the work. The Job Hazard Analysis procedure and form have evolved into a very important ES&H tool. The "JHA" form is a two-page form that efficiently guides workers and job supervisors to consider the multitude of hazards that may be associated with a work task and also to plan the appropriate controls to mitigate the actual hazards for the particular job. The JHA form is routinely applied to work performed by subcontractors and PPPL staff.

Depending on hazard categorizations, reviews of the readiness to operate are conducted prior to commencement of work activities. Worker qualification requirements are defined and documented to ensure appropriate training is provided using existing Laboratory training courses or by developing specialized courses. Pre-job briefs, using the JHA form as the basis, are also conducted with line workers, supervisors and subcontractors to assure awareness of the existing hazards and controls that are to be implemented.

During the conduct of work activities, Laboratory control systems are utilized such as configuration management; ES&H oversight, using professionals in the areas of health physics, industrial hygiene, occupational medicine, industrial safety, electrical safety, fire safety, environmental management; and quality audits and inspections. These systems, based on industry and DOE standards and Directives, provide assurance that safe work practices are followed and are in accordance with applicable laws and regulations.

Work activities are assessed and performance is measured using contractual performance measures, self-assessments, independent assessments, Unified Safety Reviews (USRs), experiment run assessments, post-job briefs and audits. The Laboratory works closely with DOE Princeton Site Office (DOE-PSO) to establish performance expectations and measures. That cooperation carries over to the daily and periodic activities that PPPL and DOE-PSO perform to assess and assure that those expectations are met or exceeded by Laboratory performance. That DOE/PPPL partnership and commitment to performance excellence is exemplified by extraordinary cooperation in the scheduling and conduct of USRs, emergency response drills, audits, Business Oversight Reviews, facility walkthrough inspections, surveillance of work activities, and participation in design and program reviews and planning. The Lab, in conjunction with PSO, establishes an "Integrated ES&H Assessment Schedule". Development of the schedule (which has been expanded to also include other business areas as part of the Contractor Assurance System, and is now referred to as the "Integrated Assessment Schedule") is coordinated by the Best Practices Office and integrates PSO, PPPL and external ES&H assessment activities for the Fiscal Year into a

comprehensive plan for assessing the PPPL ISM program. This integrated approach considers all ES&H areas and results in the efficient allocation of PPPL and PSO assessment resources where they are most warranted. The schedule is considered a “living document” and is updated as assessments are completed, added or rescheduled. At the end of each Fiscal Year, the matrix serves as a tool to help evaluate PPPL’s overall ISM performance, and subsequently determine what assessments are warranted for future years.

Laboratory ES&H performance is reported in several ways. Recordable injuries, lost work cases, lost work days as well as energy and environmental performance measures are tracked and made available to Laboratory management and DOE in accordance with DOE Orders and OSHA requirements. Contract performance metrics, assessment results, progress reports, and other performance indicators are published frequently. Quarterly management reviews also share and discuss performance information. Annually, PPPL reports to DOE-PSO the status and effectiveness of the PPPL ISM system. The report, along with the annual revision of this ISM System Description, serve as the annual PPPL declaration and commitment to ISM. Ongoing assessments of the ISM System are planned for each fiscal year and included in the Integrated Assessment Schedule.

When appropriate, root cause analyses and incident investigations are performed and the results are followed-up and shared via Laboratory, DOE, and industry lessons learned programs – the objectives being to improve PPPL programs and activities, preventing recurrence of negative events, and helping other Laboratories and facilities do the same. Laboratory procedure GEN-006, “Investigation and Follow-up of Adverse Events and Conditions including Occurrence Reporting and Price Anderson Amendment Act Reviews,” requires that incidents be looked at with more scrutiny, including determining if the “extent of cause” and the “extent of condition” exist elsewhere within the Laboratory or at other facilities. Over the years, the PPPL ESH&S Newsletters have been very effective in communicating lessons learned and heightening worker awareness of ES&H issues, and now accident investigation reports are widely shared and discussed with Laboratory management and staff.

Consistent with Clause H.50 of prime contract DE-AC02-09CH11466, the "Assurance System Description for Princeton Plasma Physics Laboratory" describes PPPL's Contractor Assurance System, which includes Department of Energy (DOE) and Princeton University involvement and supports their mutual efforts to ensure: mission objectives are met;

workers, the public, and the environment are protected; and operational, facility, and business systems are effectively run and contract requirements are met.

The Assurance System is an integral part of the PPPL management system. It is the policy of Princeton University and PPPL to implement the Assurance System effectively, efficiently, safely and securely so that the Laboratory mission is accomplished and we are in compliance with legal requirements, contract requirements and other customer commitments, and funding and assets are used most productively in support of the mission of the Laboratory and in the interests of taxpayers. It is the responsibility of all PPPL staff members to assure the effectiveness, efficiency, and compliance of work activities, consistent with the Integrated Safety Management and Institutional Quality Assurance policies. The Assurance System is integral to keeping the Laboratory on course in achieving its mission and minimizing the effects and unacceptable risks of non-conformances. Our program emphasizes three key principles:

- The most essential resources are the dedicated, diligent, and creative staff.
- People who perform the work have the greatest effect on outcomes and quality.
- Problem prevention is more cost-effective than problem correction.

Accordingly, our program establishes a management system that provides a process for continuous improvement in the operational management of the Laboratory and the unique relationship between Princeton University and the Department of Energy.

Individual's work activities and awareness of ES&H principles are also assessed by use of personnel performance appraisals, small group meetings, frequent supervisor-worker discussions, management walkarounds as well as co-worker dialogue. These means are also used effectively to solicit line worker feedback and suggestions, as well as reinforce the principle of personal responsibility for safety, security, and environmental stewardship. Every employee is made aware of their right and responsibility to stop any unsafe activities. This is a written Policy that is well understood and taken very seriously.

Additional valuable feedback and continuous improvement mechanisms have been added to the ISMS in recent years. Safety Forums and the online "Safety Or Suggestion Box" allow workers to submit comments and suggestions on ES&H issues, directly or anonymously. The issues are then prioritized and tracked to resolution.

The PPPL Worker Safety and Health Program document formally documents how the PPPL program implements the requirements of Subpart C of 10 CFR Part 851, DOE Worker Safety and Health Program Final Rule. PPPL reviews this document at least annually for any needed changes and documents this review with the DOE Princeton Site Office (PSO).

Assigning responsibility for specific Laboratory areas and facilities to individuals and their supervisors and providing them with increased ES&H training has heightened all worker's awareness of safety and improved ES&H performance. Evolving from the institutional level Facility Manager (FM) program and precursor programs, PPPL has seen line supervisors, managers, and workers take more responsibility and ownership for the safety of their facilities and work activities in recent years. At this point, the concept of line responsibility is integrated with the organization structure for the Laboratory and entails varying levels of responsibility and authority.

At times, issues arise which are beyond the control and authority of individual line managers. Examples could include the need to modify a facility structure in order to provide appropriate lighting, ventilation, environmental sustainment, safety features, etc. In these cases, the Laboratory's Engineering and Infrastructure Department has the responsibility and authority for addressing these global issues. While considering ES&H aspects of these issues, the Department determines the appropriate priorities for resolving the issues by re-evaluating the Work Order queue or applying the GPP prioritization process, as appropriate. Furthermore, representatives from the Engineering and Infrastructure Department fulfill the "On-duty Facility Manager" responsibilities outlined in the DOE Occurrence Reporting process. Under the leadership of the Associate Director for Engineering and Infrastructure, the Department provides facility management support for technical/experimental facilities, which include D-Site; and specific experimental facilities at C-Site (the Laboratory Wing; the COB, CS, RF and MG Building complex; and the CAS/RESA Buildings). The Department also provides facility management support for the remaining buildings, grounds and property at C-Site. Responsibilities of the Associate Director for Engineering and Infrastructure include, for example:

- maintaining an awareness of activities (e.g., renovations, modifications, construction, etc.) that affect multiple buildings/facilities;
- performing periodic walkthroughs of the work place and work activities with responsible line managers; and

- ensuring that cognizant DOE Facility Representatives are kept apprised of ES&H related issues.

PPPL has established a formal program for identifying and qualifying “competent persons” in areas of work that are performed at PPPL and covered under applicable OSHA regulations. Individuals were designated as PPPL Competent Persons for the OSHA areas under their expertise. A comprehensive listing of PPPL Competent Persons has been established. The result of this effort is assurance that the Laboratory has knowledgeable individuals, with documented qualifications, in each applicable OSHA area. As a complement to the list of OSHA competent persons is the list of PPPL ES&H Standards and Cognizant Points of Contact. This list contains the names of PPPL experts for the broader array of ES&H topical areas along with related PPPL training courses that may be required for these roles. In addition to these lists of experts and contacts, procedure GEN-007, "Review and Implementation of Laws, Regulations, Standards, and DOE Directives," identifies the PPPL organizations that have responsibility for identifying laws and regulations that apply to PPPL, maintaining familiarity with them, with and for informing appropriate Laboratory management, personnel, and committees of those laws and regulations.

Responsibilities

By the Prime Contract, Princeton University has the responsibility for managing and operating the Laboratory. These responsibilities are firmly rooted with the Laboratory Director and Deputy Directors. The ISM responsibilities flow down to all Laboratory managers and workers through the Head of the ESH&S Department, the ES&H Executive Board, the Associate Director for Engineering and Infrastructure, and through all Department and Project Heads (the PPPL Organization chart is shown in Attachment 3). The Head of the ESH&S Department reports to the office of the PPPL Director (through the Deputy Director for Operations) and is a member of PPPL Council. General responsibilities for PPPL workers and managers to conduct work safely are defined in the PPPL document O-027, "Line Management Safety Organization" and in the Position Descriptions for individual positions. PPPL O-027 describes responsibilities of line workers, the chain of line management (Department Heads, Division Heads, Supervisors, Area Coordinators), and oversight and expertise provided by ES&H professionals, subject matter experts, and Facility Managers. Additional specific personnel responsibilities are clearly defined in

documents for specific activities. Laboratory and subcontractor responsibilities are defined in contracts, regulations, and procedures. Project and work approval authorities are specified for employing safety principles and functions dependent on hazard levels.

Line management presence and involvement in work activities is key to the Laboratory reaching the highest levels of safety performance. In order to increase line management involvement, as well as increasing worker-management interaction and feedback, the Laboratory implements the DuPont STOP™ program (a behavior based safety program. The goal of the program is to prevent workplace injuries by learning what actions lead to accidents and then preventing those actions from occurring or recurring. Supervisors have been trained to perform safety audits and record observations of work practices and conditions. The STOP™ program has been helpful in identifying opportunities for improvement in addition to positive work behaviors that have been exhibited by employees. These positive behaviors are reinforced and shared. The web based SafetyWiki allows safety information to be easily located, and provides plain-language summaries for quick comprehension. This new interface puts the answers to common ES&H questions “right at the fingertips” of the workforce. The SafetyWiki is designed to be continually improved to provide the workforce with answers to safety-related questions.

The Laboratory is responsible for compliance with the ES&H requirements applicable to the contract regardless of the performer of the work. This responsibility includes the safety of all on-site subcontractor organizations. Subcontractors must meet PPPL specified safety, environmental sustainment, and security expectations. Basic required ES&H management elements are listed in subcontract Terms and Conditions. Subcontracts provide the Laboratory with the right to stop work that does not comply with ES&H regulations and requirements. Subcontracts involving complex or hazardous on-site work include appropriate requirements/clauses substantially the same as Department of Energy Acquisition Regulations clause 48 CFR 970.5223-1 “Integration of environment, safety, and health into work planning and execution.” Also, depending on the complexity and hazards associated with the work, and whether construction activities are involved, PPPL may require that the subcontractor submit a Safety Management program and implementation plan for PPPL's review and approval. Subcontractors and visitors are subject to the same security and access controls that apply to employees. Each subcontractor and visitor must have an authorized PPPL host prior to being given site access. Laboratory employees who are responsible for writing Statements-Of-Work, or who otherwise bring subcontractors to the Laboratory, work with the Procurement Division, ESH&S Department, and the

Environmental Services Division to ensure that appropriate ES&H requirements are included in subcontracts and met.

IV. Attachments

1. PPPL ISM Document Application
2. PPPL Organization Chart

PPPL ISM Principles/Functions Matrix

- P1 = Principle 1 Line Management Responsibility for Safety
- P2 = Principle 2 Clear Roles and Responsibilities
- P3 = Principle 3 Competence Commensurate with Responsibilities
- P4 = Principle 4 Balanced Priorities
- P5 = Principle 5 Identification of Safety Standards and Requirements
- P6 = Principle 6 Hazards Control Tailored to Work Being Performed
- P7 = Principle 7 Operations Authorization
- F1 = ISM Function #1 Define the scope of work
- F2 = ISM Function #2 Analyze the hazards
- F3 = ISM Function #3 Develop and implement hazards controls
- F4 = ISM Function #4 Perform work within controls
- F5 = ISM Function #5 Provide feedback and continuous improvement

<u>Document</u>	<u>Applies to</u>											
	P1	P2	P3	P4	P5	P6	P7	F1	F2	F3	F4	F5
Policies												
P-001 Graded Approach	✓	✓		✓	✓	✓	✓		✓			
P-002 Environmental Stewardship	✓	✓		✓	✓	✓	✓		✓			
P-003 Environment, Safety and Health Policy	✓	✓		✓	✓	✓	✓		✓			
P-004 Quality Assurance	✓	✓		✓	✓	✓	✓					
P-008 Staff Training and Development	✓	✓	✓	✓	✓	✓	✓			✓		
P-010 Design Reviews	✓			✓	✓	✓	✓		✓	✓		
P-012 Stop Work Authority	✓	✓		✓	✓	✓	✓			✓	✓	
P-013 Use of Procedures	✓			✓	✓	✓	✓					
P-014 Waste Minimization	✓	✓		✓	✓	✓	✓		✓	✓		
P-017 Working Alone	✓	✓		✓	✓	✓	✓		✓	✓	✓	
P-020 Policy for Research Sponsored by Non-DOE Entities	✓	✓			✓		✓		✓			
P-027 ALARA	✓	✓		✓	✓	✓	✓					
P-029 PPPL Examination Program	✓	✓	✓		✓	✓	✓					
P-032 Hierarchy of Documents	✓											
P-033 Unauthorized Persons in the Workplace	✓	✓	✓		✓							
P-036 Asbestos Management	✓	✓	✓	✓	✓	✓	✓		✓	✓		
P-038 Control of Hazardous Energy Sources	✓	✓		✓	✓	✓	✓		✓	✓		
P-039 Hazard Analysis and Controls	✓			✓	✓	✓	✓		✓	✓		
P-041 Suspect Parts	✓	✓		✓	✓		✓		✓			
P-044 External Audits and Appraisals and PPPL Submissions to the ORPS and NTS	✓	✓		✓								
P-045 Working on Rotating Equipment	✓	✓		✓	✓	✓	✓			✓		
P-046 Cable Tagging and Removal		✓		✓	✓	✓	✓			✓		
P-048 Safety Analysis and Review System Program	✓			✓	✓	✓	✓		✓			
P-049 Authorization for Work on Electrical Systems	✓	✓	✓		✓	✓	✓			✓		
P-051 Review and Approval of Policies,		✓	✓									

PPPL ISM Principles/Functions Matrix

	P1	P2	P3	P4	P5	P6	P7	F1	F2	F3	F4	F5
Procedures, Plans, and Manuals												
P-052 Special Processes	✓		✓		✓	✓	✓					
P-053 Eating, Drinking and Smoking in Radiologically Controlled Areas					✓	✓	✓					
P-062 Reduction of Ozone Depleting Substance Emissions	✓	✓	✓	✓	✓	✓	✓		✓			
P-063 Handling, Shipping and Storage						✓			✓	✓		
P-071 Inspection and Acceptance Testing	✓	✓	✓	✓	✓	✓	✓					
P-072 Procurement Assurance (ES&H, Quality and Technical Requirements)	✓			✓	✓	✓	✓					
P-073 Blood Borne Pathogens		✓	✓		✓				✓	✓		
P-075 Configuration Management	✓			✓	✓	✓	✓					
P-076 Internal Communications	✓	✓										
P-077 Roles and Responsibilities for General Plant Projects	✓	✓	✓	✓	✓	✓	✓					
P-078 External Correspondence Concurrence Signatures	✓			✓								
P-079 Identification and Control of Materials	✓											
P-080 Variances to ES&H Regulations	✓	✓		✓	✓	✓	✓		✓			
P-082 Environmentally Preferred Purchasing	✓	✓		✓		✓			✓			
P-083 Lessons Learned and Their Promulgation	✓	✓	✓	✓	✓	✓	✓					✓
P-084 Management Safety Walkthroughs	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓
P-085 Environment Safety and Health Policy for Off-Site Work	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
P-086 Specifying, Using, and Calibrating Measuring and Test Equipment	✓	✓	✓	✓	✓	✓				✓		
P-088 Computer Use Policy	✓	✓		✓	✓	✓	✓		✓	✓	✓	
P-089 Moratorium on the Release of Surplus and Scrap Materials	✓	✓		✓	✓	✓	✓		✓	✓		
P-094 Cyber Security Policy	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
P-095 Protection of Personally Identifiable Information	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
P-096 Independent Verification	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
P-101 Export Control	✓	✓		✓	✓	✓	✓		✓	✓	✓	
P-105 Energy Management	✓	✓		✓	✓	✓			✓	✓	✓	
Organization/Mission Statement												
O-001 Laboratory Mission	✓	✓	✓	✓	✓	✓	✓					
O-008 Engineering and Infrastructure Department Organization and Mission	✓	✓	✓	✓	✓	✓	✓			✓	✓	
O-010 Theory Department Charter		✓	✓	✓								
O-012 Best Practices and External Affairs Department Charter	✓	✓	✓	✓	✓	✓						✓
O-014 Human Resources Charter	✓	✓	✓	✓								
O-015 Business Operations Department Charter		✓	✓	✓								
O-016 Plasma Science & Technology Mission Statement		✓	✓	✓								
O-021 ES&H Executive Board Charter	✓	✓	✓	✓	✓	✓	✓		✓	✓		
O-022 Safety Review Committee Charter	✓	✓	✓	✓	✓	✓	✓		✓	✓		

PPPL ISM Principles/Functions Matrix

	P1	P2	P3	P4	P5	P6	P7	F1	F2	F3	F4	F5
O-023 Environmental Review Committee Charter	✓	✓	✓	✓	✓	✓	✓		✓	✓		
O-024 ALARA Review Committee Charter	✓	✓	✓	✓	✓	✓	✓		✓	✓		
O-025 Electrical Safety Subcommittee Charter	✓	✓	✓	✓	✓	✓			✓	✓		
O-027 Line Management Safety Organization	✓	✓	✓	✓	✓	✓	✓		✓	✓		
O-041 Suspect and Counterfeit Items Committee Charter	✓	✓	✓	✓	✓				✓	✓		✓
O-042 Environment, Safety, Health and Security (ESH&S) Department Charter	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
O-043 ITER and Tokamaks Department Mission Statement	✓	✓	✓	✓	✓	✓						
O-044 Technical Resources Committee (TRC) Charter	✓	✓	✓	✓	✓	✓	✓		✓	✓		
O-045 Lithium Experts Committee Charter	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓
O-046 Safety Champion Charter	✓	✓	✓	✓	✓	✓			✓	✓		✓
Procedures												
GEN-001 Policy, Procedure and Mission Statement, Development, Review and Approval	✓	✓					✓					✓
GEN-006 Occurrence Reporting and Processing of Operations Information	✓	✓	✓	✓	✓							✓
GEN-007 Review and Implementation of Laws, Regulations, Standards, and DOE Directives	✓	✓		✓	✓		✓					
GEN-008 Coordination of Visits, Assignments and Collaborations at PPPL	✓	✓	✓									
GEN-009 GPP Prioritization	✓	✓		✓			✓	✓				
GEN-011 ES&H Deficiency Reporting	✓	✓	✓	✓	✓	✓	✓	✓				✓
GEN-015 Procedure for Research Sponsored by Non-DOE Entities	✓	✓		✓	✓	✓	✓	✓	✓	✓		
GEN-023 Records Management	✓				✓	✓	✓					
GEN-030 PPPL Commitment Tracking and Reporting Protocol	✓	✓	✓	✓	✓							✓
GEN-032 Sharing PPPL Theory and Computation Department Codes with Researchers at Other Institutions				✓					✓	✓		
GEN-033 PPPL Management Group and PPPL Advisory Board	✓	✓	✓	✓	✓	✓	✓					
ESH-001 Use of Safety, Accident Prevention, and Equipment Protection Tags	✓	✓			✓	✓				✓		
ESH-002 Facility Safety Signs and Barricade Tapes	✓	✓			✓	✓						
ESH-004 Job Hazard Analysis	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ESH-008 Access to Radiologically Controlled Areas (RCAs)	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
ESH-013 Non-Emergency Environmental Release - Notification and Reporting	✓	✓			✓	✓					✓	
ESH-014 NEPA Review System	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
ESH-015 Hazard Assessment by Emergency Response Zone	✓	✓			✓	✓	✓		✓			
ESH-016 Control of Hazardous Energy (Lockout/Tagout)	✓	✓	✓		✓	✓				✓	✓	
EWM-001 Hazardous Waste Management	✓	✓	✓	✓	✓	✓				✓		
EWM-004 Satellite Accumulation Areas	✓	✓	✓		✓	✓				✓		

PPPL ISM Principles/Functions Matrix

	P1	P2	P3	P4	P5	P6	P7	F1	F2	F3	F4	F5
EWM-005 Asbestos Management Services	✓	✓			✓	✓				✓	✓	
EWM-007 Air Environmental Permitting and Monitoring Program Requirements	✓	✓	✓	✓	✓	✓				✓	✓	
QA-002 PPPL Audit Program	✓	✓		✓	✓	✓	✓					✓
QA-003 Procurement Quality Assurance	✓	✓			✓							
QA-004 PPPL Site Inspection Program	✓	✓		✓	✓	✓	✓					
QA-005 Control of Nonconformances	✓	✓			✓	✓	✓					
QA-012 Corrective Action Request	✓	✓			✓	✓	✓					
QA-017 PPPL Tracking and Trending System	✓	✓		✓	✓	✓	✓					✓
QA-019 Root Cause Analysis	✓	✓	✓		✓	✓	✓					✓
QA-020 Identifying and Dispositioning of Suspect Parts	✓	✓			✓	✓						✓
QA-023 Design and Improvement of Processes	✓			✓	✓							
QA-025 Management Assessments	✓			✓	✓		✓					
ENG-005 General Plant Projects Administration	✓	✓			✓	✓						
ENG-006 Preparation, Review and Approval of Specifications & Statements of Work	✓	✓			✓	✓		✓				
ENG-007 Reliability, Availability & Maintainability (RAM) Modeling & Apportionment		✓		✓	✓	✓			✓			
ENG-008 Failure Modes and Effects Analysis	✓	✓		✓	✓	✓	✓		✓			
ENG-009 Electric Service Load Reduction					✓		✓					
ENG-010 Control of Drawings, Software, and Firmware	✓	✓			✓	✓	✓	✓		✓	✓	
ENG-011 Interlock Key Control	✓	✓			✓	✓				✓	✓	
ENG-012 Identification & Control of Items	✓	✓			✓	✓						
ENG-014 Hydrostatic and Pneumatic Testing	✓	✓			✓	✓	✓				✓	
ENG-016 PPPL Preventive Maintenance Program	✓	✓			✓	✓	✓					
ENG-019 PPPL Engineering Standards	✓	✓	✓	✓	✓	✓						
ENG-020 Project Execution Plan	✓	✓		✓	✓							
ENG-021 Hoisting and Rigging Program	✓	✓	✓		✓	✓				✓	✓	
ENG-022 Scheduled Site Power Outage Notification		✓				✓	✓					
ENG-024 Digging Permits	✓	✓			✓	✓				✓	✓	
ENG-025 Impairment of Fire Dampers and Fire Doors	✓	✓			✓	✓	✓			✓	✓	
ENG-026 Fire Detection and Suppression Systems	✓	✓			✓	✓	✓					
ENG-027 Fire Barrier Penetration Seal Installation and Repair	✓	✓			✓	✓	✓			✓	✓	
ENG-028 Core Boring, Cutting & Drilling	✓	✓			✓	✓	✓			✓	✓	
ENG-030 PPPL Technical Procedures for Experimental Facilities	✓	✓			✓	✓	✓	✓		✓		
ENG-032 Work Planning Procedure	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	
ENG-033 Design Verification	✓	✓	✓		✓	✓		✓	✓	✓		
ENG-034 Cyber Security Incident Response	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ENG-037 General Welding and Brazing Requirements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
ENG-038 Welding Materials Control	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

PPPL ISM Principles/Functions Matrix

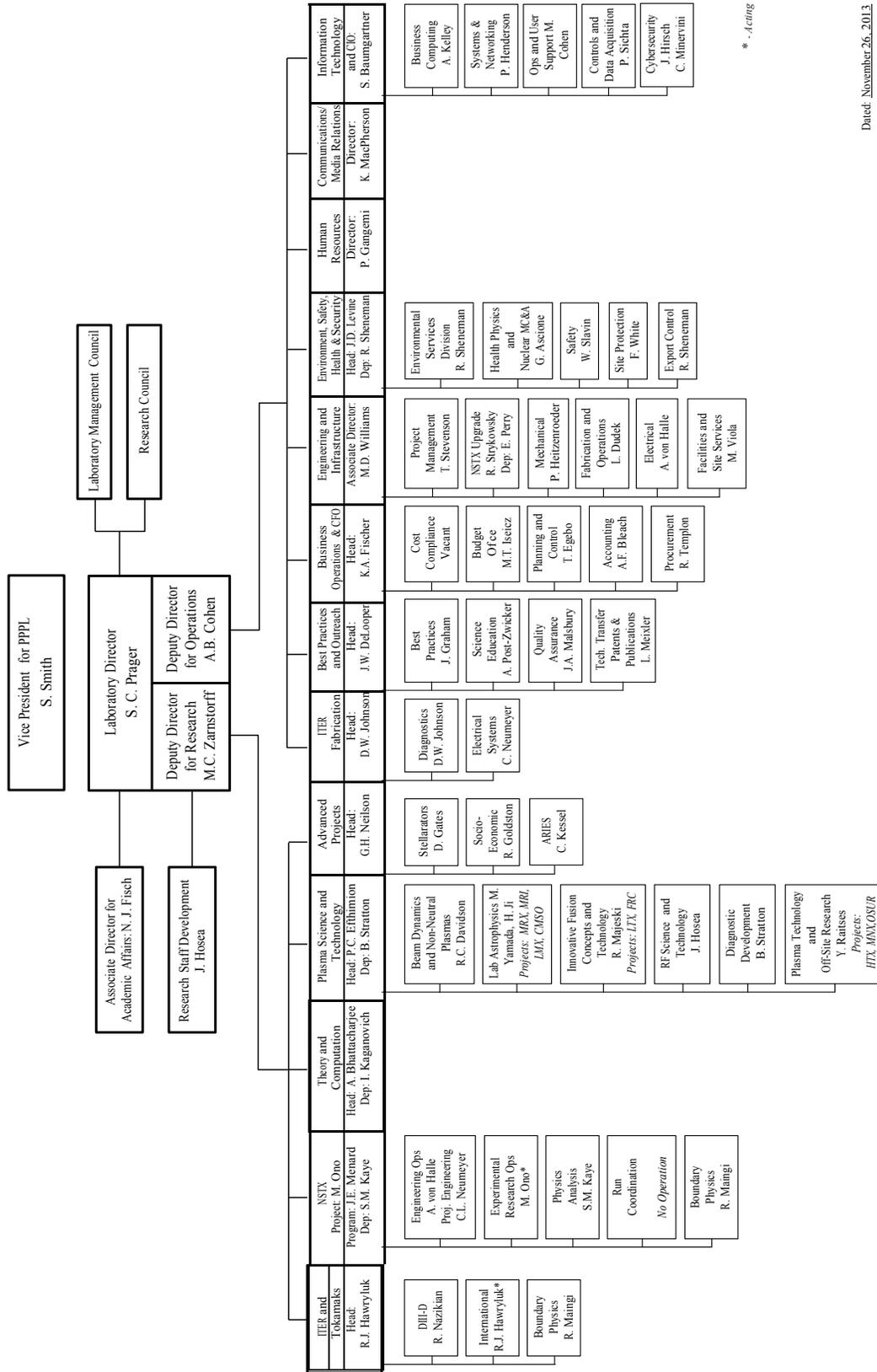
	P1	P2	P3	P4	P5	P6	P7	F1	F2	F3	F4	F5
ENG-039 Computer Center Work Control	✓	✓			✓	✓	✓	✓	✓	✓	✓	
ENG-041 Electrician Qualification		✓	✓		✓	✓	✓			✓		
ENG-042 Boiler Operator Qualification		✓	✓		✓	✓	✓			✓		
ENG-043 Carpenter Qualification		✓	✓		✓	✓	✓			✓		
ENG-044 HVAC Mechanic Qualification		✓	✓		✓	✓	✓			✓		
ENG-045 Table Top Tool Safety Training, Apprentice Machinist and Qualified Machinist Qualification		✓	✓		✓	✓	✓			✓		
ENG-046 Metal Fabricator Qualification		✓	✓		✓	✓	✓			✓		
ENG-047 Facilities Technician Qualification		✓	✓		✓	✓	✓			✓		
ENG-048 Machine/ Carpenter Shop Equipment Safety Checklists	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
ENG-050 Job Requirements Documentation and Control				✓	✓	✓						
ENG-052 Operating Expense (OPEX) Projects Prioritization and Administration	✓	✓	✓	✓	✓	✓	✓		✓	✓		
ENG-053 Job Cost Estimate Development & Review				✓	✓	✓						
ENG-055 Conduct of Operations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ENG-057 COG, RLM, and Project Manager Selection and Training	✓	✓	✓				✓	✓	✓	✓	✓	✓
PER-006 PPPL Guided Tour Program and Escort Responsibilities	✓	✓	✓									
TR-001 Laboratory Training Program	✓	✓	✓									
TR-005 Instructor Qualification and Requalification			✓									
TR-006 Establishing Qualification and Certification Requirements		✓	✓									
TR-007 Guidelines for Developing Training Matrices	✓	✓	✓	✓	✓							
MC-004 Acquisition and Disposal of Excess Government Property	✓	✓			✓	✓						
MC-005 Shipment of Equipment/Material to Off-Site Location	✓	✓			✓	✓						
MC-009 Adding Material to Stores Inventories	✓	✓	✓	✓	✓							
MC-013 Export Control	✓	✓			✓	✓						
ACT-003 Foreign Travel	✓	✓	✓	✓	✓	✓						
Plans And Other Documents												
Worker Safety and Health Program	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Environment, Safety and Health Directives Manual	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
PPPL Environmental Management System	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Environmental Monitoring Plan		✓	✓	✓	✓	✓	✓					
PPPL Annual Site Environmental Report	✓											✓
Stormwater Pollution Prevention Plan	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Beneficial Landscape Plan	✓	✓		✓	✓							
Nuclear Materials Control and Accountability Plan	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Radiological ALARA Plan	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Radiation Protection Program	✓	✓	✓	✓	✓	✓	✓		✓		✓	

PPPL ISM Principles/Functions Matrix

	P1	P2	P3	P4	P5	P6	P7	F1	F2	F3	F4	F5
Institutional Quality Assurance Plan	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
Assurance System Description	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Project Control System Description	✓	✓	✓	✓	✓	✓	✓					
On-Site Transportation Safety Program	✓	✓	✓	✓	✓	✓	✓					
PPPL Engineering Standards	✓	✓	✓	✓	✓	✓	✓					
Security Plan	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Cyber Security Program Plan	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
PPPL Emergency Preparedness Plan	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
PPPL Pandemic Plan	✓	✓	✓	✓	✓	✓	✓					
PPPL Project Management System Description	✓	✓	✓	✓	✓	✓	✓					
ES&H Procedures	✓	✓	✓	✓	✓	✓	✓					
Occupational Medicine Office Procedures	✓	✓	✓	✓	✓	✓	✓		✓	✓		
Project/Department Procedures	✓	✓	✓	✓	✓	✓	✓					
Safety Assessment Documents (SADs)	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Site Sustainability Plan	✓	✓	✓	✓	✓	✓	✓					
Low-Level Radioactive Waste Management Basis	✓	✓	✓	✓	✓	✓	✓					
Environmental Radiation Protection Program	✓	✓	✓	✓	✓	✓	✓					
Energy Management Plan	✓	✓	✓	✓	✓	✓	✓					
Project Management System Description	✓	✓	✓	✓	✓	✓	✓					
Contract Performance Measures												✓
Performance Metrics												✓
PPPL/DOE Unified Safety Review Program												✓
PPPL Personnel Practices Manual												✓
Low-Level Radioactive Waste Management Basis								✓	✓	✓	✓	✓
Environmental Radiation Protection Program								✓	✓	✓	✓	✓
Energy Management Plan								✓	✓	✓	✓	✓
Project Management System Description								✓	✓	✓	✓	✓
Other Mechanisms												
OP-AD-77 Operating and Maintenance of Tritium Contaminated Systems											✓	
Field Work Proposal Process								✓				
Project and Department Job Cost Estimating Processes								✓				
Work Authorization Forms								✓				
Facility Work Order System								✓				
Project Design Change Authorization Systems								✓				
Project and Facility Configuration Management Systems								✓				
Permit Processes								✓				
Operational Readiness Preparations								✓				

Organizational Chart

PRINCETON PLASMA PHYSICS LABORATORY



* - Acting

Dated: November 26, 2013

Organizational Chart

Attachment 2.

Current Chart found at: <http://www.pppl.gov/orgchart>