

PPPL	PRINCETON PLASMA PHYSICS LABORATORY	PROCEDURE		No. ENG-006 Rev 6 page 1 of 6
		Subject:	Effective Date: July 13, 2017	Initiated by: Head, Engineering
Preparation, Review & Approval of Specifications & Statements of Work		Supersedes:	Approved:	
		Revision 5, dated 11/20/13 and related TCRs	Director	

TCR ENG-006,R6-002

Management System (Primary): 03.00 Engineering
Management System Owner: Head, Engineering
Management Process: 03.06 Technical Project Management
Process Owner: Head, Project Management Office
Subject Matter Expert (SME): Head, Project Management Office

APPLICABILITY

This procedure applies to activities and projects at PPPL and to off-site work including collaborations, Strategic Partnership Projects, subcontracted work, and purchased items and services – unless superseded by external agreements or contracts. This includes purchase orders, subcontracts, Basic Ordering Agreements (BOAs) and Blanket Purchase Agreements (BPAs). For BOAs, a Statement of Work (SOW) describing the nature of the work and common requirements must be included in the BOA itself. Each job order under a BOA requires a detailed SOW, or an addendum defining the job specific requirements and deliverables, or a procedure per [ENG-030](#); that is reviewed by the PTR, the Responsible Engineer (NSTX-U only) and approved by the Responsible Line Manager (RLM) and includes job-specific safety requirements and necessary hold points to verify that safety and quality requirements are satisfied prior to proceeding with work.

INTRODUCTION

This procedure provides requirements and guidance for the development, review and approval of specifications and Statements of Work (SOWs). These documents may be standalone documents that govern internal work activities and fabrications, or as part of a procurement package, or external agreement such as a Memorandum of Understanding. A SOW/SPEC may be required per an approved Work Planning form per ENG-032.

A **Specification** is typically developed for equipment or hardware that is either fabricated in-house at PPPL or procured from a Vendor. A specification thoroughly describes the equipment or hardware and its requirements, including functionality and acceptance criteria.

Specification for construction activities may use the format of commercially available specification libraries provided:

1. There is a SOW or an umbrella specification that addresses the applicable topics of each section of the SOW, see Attachment 1, and;
2. There is revision control of the sections, including a listing of the applicable sections.

A **Statement of Work** is typically developed for services or activities that are either subcontracted or provided by in-house shops, and involves large, complex, or non-routine work scopes or activities. These activities may involve coordination of multiple work activities, be governed by more than a single engineering standard, or involve specific testing and inspection methods and criteria. Applicable environment, safety and health (ES&H) requirements must be included in SOW's for subcontracted work that is to be performed at PPPL as defined in Policy

P-072, Procurement Assurance. The exception is for small, routine work scopes where a less detailed description of work may be prepared, provided it is accompanied by a Job Hazard Analysis (see procedure ESH-004). There is additional information to guide and the SOW to Purchase Order process located in the PPPL Procurement Policies & Procedures Manual Section 2-6, Specifications and Statements of Work.

There may be cases where it is appropriate for a SOW to include references to specifications for related equipment and hardware.

Attachment 1 provides a sample of the required template for developing a PPPL SOW or Specification. A link is provided to the current SOW Form: [Link to Engineering SOW Form](#). All fields of information must be filled-in or marked as not-applicable (NA). If an entire section is marked as not-applicable, it is not necessary to enter all subsections as NA. Sections may not be omitted without written approval by the Head of Engineering, and only if they were determined to be not applicable. Changes to the sequencing of sections, minor naming changes, or minor formatting changes may be made with the approval of the RLM, to accommodate better flow of information.

If no part of the SOW applies beyond Section 1.0 Intro and Scope, then the SOW template is not needed for the procurement. If the SOW template is not needed, other simple attachments may be used per the discretion of the RLM or the Director of Procurement. Specifically, the procurement has no engineering, QA, or ESH (including equipment usage) content. Otherwise the Attachment 1 template must be used.

When a designated approver cannot sign and there is no specified designee, the document must pass up the organization chart for signature. The substitute should consult appropriate technical personnel prior to signing.

REFERENCES

- [ESH-004, Job Hazard Analysis](#)
- [GEN-023, Records Management](#)
- [ESHD 5008 Safety Manual ES&H Directives](#)
- [ENG-032 Work Planning Procedure](#)
- [P-018, Subcontract Proposal Evaluation Board \(SPEB\) Policy](#)
- [P-072 Procurement Assurance](#)
- [P-082 Environmentally Preferable Purchasing](#)
- PPPL Procurement Policies and Procedure Manual

A. PROCEDURE

Responsibility

Cognizant
 Individual /
 Accountable
 Technical
 Individual (ATI)

Action

1. Determines if a specification and/or Statement of Work (SOW) is required or appropriate for items and services and obtains concurrence from Supervisor/Responsible Line Manager (RLM). [See definitions of SOW/specification in the Introduction for guidance].
2. Develops specification/SOW in accordance with the guidelines provided in Attachment 1 and Project / Department requirements.

This includes the list of all deliverables, which is integral to the SOW/specification, per section 13 of Attachment 1.

Identifies palate of reviewers and approvers and obtains RLM approval of list per the following:

- ES&H review and approval is required for all specifications having safety or regulatory compliance implications and for all SOWs that involve one or more of the following:
 - PPPL on-site construction
 - Installation or modification of PPPL structures, systems, or components
 - Physical changes to PPPL site features
 - Projects that may require an environmental permit (air emissions, soil erosion, wastewater discharge, wetlands, etc.)
 - Analysis that may impact safety analysis or regulatory compliance of PPPL projects.
 - Contractor work at PPPL, such as maintenance or repair of equipment.
 - Contractor work that will require a PPPL permit and/or a Safety Watch.
- PPPL Quality Assurance review and approval is required for all specifications and SOWs involving fabricated or specially modified products, all ITER activities, as well as for on-site contracts involving special processes.
- Include additional reviewers as needed. These additional reviewers need not necessarily approve the document.
- Obtain approvals of Department Head and Head of Engineering, based on risk and graded approach.

SOW Sections may not be omitted without written approval by the Head of Engineering, and only if they were determined to be not applicable. Changes to the sequencing of sections, minor naming changes, or minor formatting changes may be made with the approval of the RLM, to accommodate better flow of information.

Cognizant
Individual /
Accountable
Technical
Individual (ATI)

3. Obtains a unique identification number for the specification/SOW from the Operations Center or Project Manager.
4. Issues specification/SOW review package to reviewers.
5. Resolves reviewer comments. Updates specification/SOW as necessary, signs the specification/SOW as the preparer, and then submits to reviewers.
6. Obtains reviewer signatures.

NSTX-U
Responsible

7. For NSTX-U only, reviews and approves the specification/SOW package, forwards to RLM.

- | | |
|---|--|
| Engineer
Supervisor /
Responsible Line
Manager (RLM) | 8. Reviews and approves the specification/SOW package. |
| Cognizant
Individual /
Accountable
Technical
Individual (ATI) | 9. Forwards the specification/SOW to the appropriate PPPL Department that will carry out the requirements, or forwards to the Procurement Division, together with a requisition and other necessary documentation.

10. Provides copies of specifications/SOW to the Operations Center (or other Project, Department or Division designated file center).

11. Increments revision level, obtains the review and approval signatures from the same individuals or functions, and reissues document if any changes are needed after the document is fully signed. |

Proceed to Section B. for on-site SOW activities.

- | | |
|---|---|
| Procurement
Division | 12. Awards contract and after consultation with and concurrence of RLM assigns the responsible Princeton Technical Representative (PTR). |
| Princeton
Technical
Representative
(PTR) | 13. Notifies the PQA representative of the contract or purchase order and establishes expectations and communications for involvement, required support, and records retention methods. |
| PQA | 14. Provides any QA Plans or other documents received from the vendor to the PTR. |
| Operations Center
or Project
Administrator | 15. Ensures that copies of project related specifications/SOWs are maintained in accordance with Project/Department requirements and procedure GEN-023, Records Management. |
| Princeton
Technical
Representative
(PTR) | 16. Executes the procurement.

17. Ensures that all deliverables have been received and annotates accordingly in Section 13 of the SOW/specification (Documentation and Deliverable).

18. Pursues missing or incomplete deliverables through Procurement.

19. Documents, in Section 13, if there are deliverables that are no longer required, with reasons, and informs the RLM.

20. Signs the bottom of Section 13 of the SOW/specification when all deliverables are received or otherwise dispositioned. |

21. Ensures that deliverables are provided to the locations identified in Section 13 of the SOW/specification.
22. Forwards the completed and fully signed Section 13 of the SOW/specification to the Operations Center (or other Project, Department or Division designated file center).

B. ON-SITE ACTIVITIES

- | | |
|---------|---|
| COG/ATI | <ol style="list-style-type: none"> 1. Manages the activities described in the SOW. 2. Ensures that all deliverables have been received and annotates accordingly in Section 13 of the SOW/specification (Documentation and Deliverable). 3. Documents, in Section 13, if there are deliverables that are no longer required, with reasons, and informs the RLM. 4. Signs the bottom of Section 13 of the SOW/specification when all deliverables are received or otherwise dispositioned. 5. Ensures that deliverables are provided to the locations identified in Section 13. of the SOW/specification. 6. Forwards the completed and fully signed Section 13 (Documentation and Deliverables Section) of the SOW/ specification to the Operations Center (or other Project, Department or Division designated file center). |
|---------|---|

C. TRAINING

- | | |
|---------------------------------|--|
| Head, Project Management Office | <ol style="list-style-type: none"> 1. Provides/assures the following training. <ol style="list-style-type: none"> A. Target Audience: <u>COGs, ATIs, and RLMs</u>
 Instructor: <u>Head, Project Management Office</u>
 Training Methods:
 <ul style="list-style-type: none"> - Incorporate in COG/ATI/RLM Project Management Training. - Combination of classroom, online, and reading as determined by the Head, Project Management. Frequency:
 <ul style="list-style-type: none"> - Initial training and periodic refresher training as determined by the Head, Project Management. B. Target Audience: <u>All Supervisors</u>
 Distributed by: <u>Head, QA/QC</u>
 Training Methods:
 <ul style="list-style-type: none"> - Read only - distribution of procedure revisions and TCRs. Frequency:
 <ul style="list-style-type: none"> - After revisions or TCR changes of this procedure. C. Target Audience: <u>Council Members</u>
 Instructor: <u>Head, QA/QC</u> |
|---------------------------------|--|

Training Methods:

- Prepare a briefing for attendees of the weekly Laboratory Leadership Council.

Frequency:

- After revisions or TCR changes of this procedure.

- Head, Engineering or Designee
2. Notifies the Human Resources Training Office of the training so that they will be aware of the training requirements and be able to provide assistance and guidance in the course development, implementation, tracking, and maintenance.

D. RECORDS MANAGEMENT

Records Documented	Record Custodian	Where Record Kept	Record Duration
Statement of Work / Specification *	Operations Center (or Designated Project/Department/Division Custodian)	Operations Center (or file center designated by Project/Department/Division)	Lifetime of Project
Deliverables List			

* Note that Procurement Files will also contain the SOW/Specification, but they will be only kept for the time designated for procurement files, which may be less than the lifetime of the project.

ATTACHMENTS

1. Format and Content Requirements for Statements of Work and Specifications (including documentation/deliverables list)
2. Statement of Work/Specification Deliverables Worksheet - Typical
3. Process Flow Charts

STATEMENT OF WORK/SPECIFICATION*(Enter either "Statement of Work" or "Specification")***FOR****TITLE OF WORK TO BE PERFORMED***(Enter the name of the items or services being specified in this document)***UNIQUE PROJECT IDENTIFIER:****Reference Work Planning #:****REVISION 0****DATED Month DD, YYYY**

PREPARED BY: _____

Cognizant Individual (COG) / Accountable Technical Individual (ATI)

REVIEWED BY: _____

ES&H

REVIEWED BY: _____

Quality Assurance

APPROVED BY: _____

Supervisor / RLM

**PRINCETON UNIVERSITY
PLASMA PHYSICS LABORATORY
P.O. BOX 451
PRINCETON, N.J. 08543
609-243-2000**

NOTE: Items and Services that have the potential to impact ES&H and/or quality require appropriate review and signature by representatives from the ES&H and Quality Assurance organizations.

All items or services for NSTX-U require that both the Responsible Engineer and the RLM sign their approval.

1.0 INTRODUCTION & SCOPE

1.1.

Provide background information, as appropriate, to improve understanding of the nature of the items, work and services required. Information on the Laboratory, projects, or systems should be included, if they provide valuable context.

Describe the intended use of the item/system or services being procured, fabricated or installed in a summary type statement.

2.0 APPLICABLE DOCUMENTS

2.1.

Provide a listing of those documents that are referenced in the SOW/specification. These may include industry standards issued by nationally recognized organizations (e.g., ASME, IEEE, NFPA, ANSI, OSHA, etc.), bulletins, manuals, drawings, and DOE Orders. References should be to the specific items required by this SOW/specification. For example, rather than stating PPPL Engineering Standards, include the name of the standards that apply (e.g., ES-MECH-007, Hoisting and Rigging).

The listing should include the edition/revision level of each listed document or have a statement that the applicable edition/revision level is the latest in effect at the time of fabrication, installation or subcontract award. If only part of a particular document is in effect or applicable, it should be so noted.

The source location of the referenced documents should be specified. Industry standards may be presumed to be available to all industry participants. Government and PPPL documents should be made available in hard copy form, or at a public Internet web site. Internet addresses should be included in the SOW/specification. PPPL Policies and Procedures are available at:

<http://bp.pppl.gov/procedures.html>

<http://bp.pppl.gov/policy.html>

3.0 APPLICABLE DRAWINGS

3.1.

Provide a listing of those drawings that are part of the SOW/specification.

The listing should include the edition/revision level of each drawing or have a statement that the applicable edition/revision level is the latest in effect at the time of fabrication,

installation or subcontract award. If only part of a particular drawing is in effect or applicable, it should be so noted.

The source location of the referenced drawings should be specified. Drawings should be made available in hard copy form, or at a public Internet web site. Internet addresses should be included in the SOW/specification.

4.0 RESPONSIBILITIES

4.1. PRINCETON PLASMA PHYSICS LABORATORY

4.1.1.

Describe single-point contact, reporting, project organization, supplies provided, etc.

4.2. SUBCONTRACTOR

4.2.1.

Describe supervision required, reporting, compliance with PPPL procedures, on-site training required, etc.

4.2.2 Notification Requirements Off-Normal Events and Issues

This notification must be in all on-site work SOWs and must be posted in a highly visible location where the work is to be performed. (Found on Engineering Forms web site)

Note: Contacting the PPPL Emergency Services Unit at X3333 to obtain emergency assistance and taking immediate actions to protect workers, guests and visitors takes precedence over the notification requirements described herein.

The Subcontractor shall notify PPPL within 15 minutes of becoming aware of off-normal events and issues; off-normal events and issues include:

- Personnel injuries of any kind
- Near misses that could have resulted in significant (recordable injury or worse) worker injuries
- Uncontrolled or unforeseen personnel exposure to radiation, chemical, biological or physical hazards (e.g., noise, laser, ultraviolet light, heat, etc.)
- Fire emergency of any kind
- Any unexpected discovery of an uncontrolled hazardous energy source (e.g., live electrical power circuit, etc.) not including discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin
- Any failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout)
- Damage of any kind to Laboratory property
- Damage of any kind to personal property owned by PPPL employees, guests and visitors
- Any spills of chemicals, fuels, lubricants, etc.
- Other off-normal events and issues deemed by the Subcontractor to require notification

In the event of an off-normal event or issue, the Subcontractor and its lower-tier subcontractors SHALL:

- Notify PPPL Emergency Services Unit at X3333 for emergency response, if required
- Take immediate action to evacuate and post affected area, if required
- STOP related work or work in affected area
- Take actions to post and safe-off affected area
- Within 15 minutes: Contact Subcontractor Site Supervisor, PPPL PTR, ESH Construction Safety Engineer and ESH Head

Regarding these off-normal events or issues, no recovery actions (other than those immediately required to preserve life safety) or repairs are to take place until they are reviewed by the Subcontractor and PPPL, and specifically authorized by the PPPL PTR or ESH Department Head. Resumption of work that has been stopped by PPPL due to off-normal events and issues must follow the provisions of PPPL Policy P-012, STOP Work Authority.

5.0 REQUIREMENTS *This section contains performance, design, maintenance, and construction requirements. Indicate "not applicable" for those subsections that are not applicable to the item or work activity being procured, fabricated or installed.*

5.1. PERFORMANCE REQUIREMENTS

5.1.1. PERFORMANCE CHARACTERISTICS

5.1.1.1.

Identify the functional characteristics which have been established by analysis or design including those which are not necessarily mission critical, but which must be specified to properly constrain a complete design. State requirements in quantitative terms that can be measured to determine acceptability of end-products and services.

5.1.2. OPERATING ENVIRONMENT

5.1.2.1.

State the environment that the component is to withstand such as maximum/ minimum temperature, humidity, pressure, magnetic fields, radiation, etc. Specify any constraints to eliminate an environmental impact (e.g., no PCB's, CFC's, etc.).

5.1.3. DESIGN LIFE

5.1.3.1.

Identify the required life cycle of the product in terms of cycles or hours of operation required. Include requirements for shelf-life and storage prior to usage.

5.1.4. RELIABILITY

5.1.4.1.

Identify reliability requirements by stating in quantitative terms such as mean time to failure, duration of down time, etc.

5.1.5. MAINTAINABILITY

5.1.5.1.

Include schedule of intended maintenance per storage or operating hour. Describe requirements for service such as access doors; built in tools; self test capability; test jacks; and other appropriate requirements.

5.1.6. HUMAN FACTORS

5.1.6.1.

Specify requirements related to user operation, such as color recognition, foolproof assembly, interlocks, etc.

5.1.7. SUSTAINABILITY

PPPL's prime contract requires the purchase of certain types of environmentally preferable products such as, but not limited to, EPEAT-registered electronic devices, ENERGYSTAR and FEMP-listed energy-consuming equipment, Water-Sense listed products, bio-based materials, EPA-designated recycled content products, non ozone-depleting chemicals and non-toxic or less toxic alternatives when practical. Where such products are available and meet the technical requirements of the work, they should be specified to the maximum extent practical. In addition, SOWs for architecture and facility design, construction, demolition and maintenance services should include the use of sustainable design practices, inventory, tracking and reporting of recyclables, and the specification on sustainable building materials and equipment to the maximum extent practical. Additional information on environmentally preferable products is available online at:

https://pppl.princeton.edu/PPPL_Environmentally_Preferable_Purchasing

5.2. EQUIPMENT DEFINITION

5.2.1. SPECIFICATIONS AND STANDARDS

5.2.1.1.

Identify and explain requirements, criteria, and constraints, pertinent to the component. Include requirements that apply from nationally recognized codes and standards as well as federal/military specifications and standards. Any referenced documents should also be listed in Section 2.0.

5.2.2. GENERAL DESIGN FEATURES

5.2.2.1.

Specify physical characteristics such as size, weight, shape, and individual critical dimensions. Requirements may be descriptive or expressed in quantitative terms. All requirements should be verifiable by inspection and should include appropriate tolerances.

5.2.3. MATERIALS

5.2.3.1.

List specific materials that are required and any materials that are prohibited for the various parts of the hardware. For subcontracts, identify any material/equipment that is being provided by PPPL.

5.2.4. ELECTROMAGNETIC INTERFERENCE AND SUSCEPTIBILITY

5.2.4.1.

Identify the electromagnetic radiation of fields the hardware may be subjected to (the susceptibility specification) and the maximum electromagnetic radiation permitted from the hardware (the interference specification).

5.2.5. IDENTIFICATION AND MARKING

5.2.5.1.

Include requirements for marking and coding the parts of the hardware such as wiring, plumbing, nameplates, etc. (see procedure ENG-012, Identification and Control of Items).

5.2.6. WORKMANSHIP

5.2.6.1.

List requirements for acceptable workmanship such as: IPC 610, Electronic Workmanship Standards; ASME and AWS codes for qualified welders and procedure; PPPL specific requirements for workmanship; or generally accepted industry practice, if appropriate. Also include requirements for cleaning and painting of hardware. Standards should be listed in Section 2.0.

Include a statement that maintenance and repair work must comply with original equipment manufacturer recommendations; including parts, workmanship standards, parts, and functionality.

5.2.7 SUBCONTRACTOR EQUIPMENT USE

Subcontractors must provide their own equipment and not use government equipment. Work activities anticipated to be performed by the subcontractor shall be reviewed by ESH and the respective SME, when appropriate. Subcontractors shall provide evidence of qualification and competence in the performance of their duties including the use of powered equipment. Should the use of government equipment become absolutely necessary, that use of equipment will require a liability release covering the use of PPPL equipment to be defined in the subcontract. All vehicles being used for work activities on the PPPL site, regardless of their maximum capable speed, must be equipped with safety belts prior to entrance.

6.0 TEST & INSPECTION REQUIREMENTS

6.1. PERFORMANCE TESTS

6.1.1.

Identify each of the performance tests that the supplier is to perform on the hardware before shipping and the acceptance criteria that must be met. These may include destructive and nondestructive tests. The tests should verify that the specified performance values have been met.

6.2. ACCEPTANCE TESTS

6.2.1.

Identify each of the acceptance tests and inspections that PPPL is to perform. If these tests and inspections require participation by supplier personnel, their participation should be specified. Also state where and when they must be performed. Acceptance criteria must be clearly identified.

6.3. SUPPLIER HOLD POINTS

6.3.1.

Identify hold points for the supplier where inspections must be made and approved prior to continuing work. Hold points are especially critical when additional fabrication and assembly will obscure performed work and workmanship. (See procedure QA-003).

6.4. QUALITY CONTROL RECEIPT INSPECTIONS

6.4.1.

Identify QC receipt inspection of parts, equipment, or other deliverables when received by PPPL prior to acceptance. Inspection shall be performed to determine compliance with drawings, SOW's and specifications. (See procedure QA-003).

7.0 QUALIFICATIONS

7.1.

List specific qualifications of workers. For example, describe if a subcontractor must provide certification or proof that repair personnel successfully completed manufacturer's training, or that welders are certified per a specific ANSI/ASME code section, or that equipment operators have documentation that they are qualified or certified to operate the equipment. Indicate what proof of the qualifications is required (resume, certification card, operator license, certificate of manufacturer's training, etc.) Qualifications for Hoisting and Rigging and mobile equipment operation and repair may be found in the specific Engineering Standard.

8.0 ENVIRONMENT, SAFETY, AND HEALTH

8.1.

The ES&H Department will provide assistance in developing this section. Identify requirements to preclude or limit hazards to personnel, the environment and /or equipment including necessary hold points to verify that safety requirements are satisfied prior to proceeding with work. Refer to hazards in assembly, disassembly, test, transport, storage, operations, and/or maintenance. Specify all applicable safety requirements unique to PPPL.

General ES&H Statement

A general ES&H Compliance Statement should be included with subcontracts, such as:

“The subcontractor shall comply with:

- the specific PPPL documents, requirements, permits and courses listed in this Statement of Work;*
- the completed subcontractor ISM Plan, and*
- all applicable Federal, State, and local laws, regulations and requirements whether or not they are specifically listed in the Statement of Work or subcontract.*
- the requirement that all vehicles being used for work activities on the PPPL site, regardless of their maximum capable speed, must be equipped with safety belts prior to entrance.*

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The following are ES&H controls that must be included in the specification or SOW if they are applicable to the work – for example if on-site work at PPPL is to be performed by a supplier, include appropriate provisions from the following items.

PPPL has safety programs that include the following areas Confined Space Permits, Digging Permits, Penetration and Fire Seal permits, Flame permits, Radiation Work permits, Lock-out/Tagout of energy sources, and restrictions on working alone. The subcontractor must confirm with their PPPL contact person that all prerequisites have been met before initiating any activity that involves these areas.”

JHA

The PPPL Job Hazard Analysis (JHA) form (see procedure ESH-004, Job Hazard Analysis) can be used as a tool to help identify ES&H hazards, controls, and related PPPL requirements that potentially apply to a subcontract. Those items identified using the JHA should then be incorporated into the SOW or subcontract documents. The ES&H Department/Industrial Hygiene will provide assistance in developing this section. Subcontractor personnel must be briefed on JHAs, just as PPPL staff must.

The JHA form can be found at the following web site:

http://bp.pppl.gov/JHA_online.doc

Specific PPPL requirements documents

Include a list of specific PPPL procedures, policies and ESH Directives that are applicable to the subcontractor's work scope. Those documents should be provided to potential subcontractors, either via Web access or as hard-copies. The list should choose from PPPL policy, procedure and ES&H documents, as applicable:

A PPPL approved lock-out tag-out procedure, and application of locks and tags by affected individuals, is required in most cases to mitigate hazards associated with any potential energy sources (electrical, mechanical, cryogenic, etc.).

<http://bp.pppl.gov/procedures.html>

<http://bp.pppl.gov/policy.html>

http://bp.pppl.gov/ESHD_MANUAL/sm.html

Applicable PPPL Permits

Include a list of PPPL permits that are applicable to the subcontractor's work scope. The list should choose from the following permits, as applicable:

- Confined Space Permit,*
- Radiological Work Permit,*
- Hot Work Permit,*
- Flame Permit,*
- Digging Permit,*
- Penetration Permits*
- Air Permit (NJDEP)*
- Wetlands Permit / Transition Area (NJDEP)*
- Soil Erosion Permit (Freehold Soil Conservation District FSCD)*

Specific OSHA requirements

Cite specific OSHA regulations that are applicable to the subcontractor's work scope if they warrant additional focus or attention by the subcontractor (note that subcontractors are required to comply with OSHA regulations by law). The cognizant individual/ATI should pay particular attention to the need for designating "competent person(s)" if the work scope requires such under OSHA. The SOW must clearly specify if this accountability will rest with PPPL or the subcontractor. PPPL Competent Persons and SMEs for specific OSHA sections are listed at: http://spportal.pppl.gov/bp/Lists/PPPL_Experts The Safety Division can be consulted for advice in this regard. For hoisting and rigging and for mobile equipment, reference the specific PPPL Engineering Standards where specific OSHA requirements may be listed and where all OSHA and ASME requirements are detailed in the specific requirements sections.

Applicable PPPL ES&H training courses

Include a list of PPPL ES&H training courses that are applicable to the subcontractor's work scope. State if the training must be provided by PPPL or if equivalent subcontractor training may be substituted with prior PPPL approval. State if a written or practical Test is required. The list should choose applicable courses from those listed at: <http://hr.pppl.gov/SafetyCourses.htm> and include them in the SOW/specification. A sample list of potential course includes:

<i>Safety Courses at PPPL</i>	<i>Written Test*</i>
<i>Advanced Electrical Safety (see EUT)</i>	
<i>Aerial Lift Boom (Classroom)</i>	<i>YES</i>
<i>Aerial Boom Lift (OJT)</i>	
<i>Asbestos Awareness</i>	<i>No</i>
<i>Basic Electrical Safety</i>	<i>YES</i>
<i>Bloodborne Pathogens</i>	<i>No</i>
<i>Bubblesuit Training</i>	<i>YES</i>
<i>Capacitor Bank Access</i>	<i>YES</i>
<i>Capacitor Bank Access OJT</i>	

<i>Compressed Gases & Cryogenic Liquids</i>	<i>YES</i>
<i>Confined Space Entry</i>	<i>YES</i>
<i>CPR</i>	<i>No</i>
<i>Crane Operator (Classroom)</i>	<i>YES</i>
<i>Crane Operator (OJT)</i>	
<i>D-site Access Training</i>	
<i>Disposable Respirators</i>	<i>No</i>
<i>Electric Utilization Training (EUT)</i>	<i>YES</i>
<i>ES&H Issues in the Workplace (Grad Students)</i>	<i>No</i>
<i>Fall Protection</i>	<i>YES</i>
<i>Fire Extinguisher Training</i>	<i>YES</i>
<i>Fire Watch Training (For D-site Fire Watch Qualification)</i>	<i>No, lecture only (Prereq. Fire extinguisher Training)</i>
<i>Forklift Training (Classroom)</i>	<i>YES</i>
<i>Forklift Training (OJT)</i>	
<i>Forklift Rigging (Classroom)</i>	
<i>Forklift Rigging (OJT)</i>	
<i>General Employee Training</i>	<i>YES</i>
<i>General Employee Training for Subcontractors</i>	<i>YES</i>
<i>Hazard Communication (Formerly Right-to-Know)</i>	<i>YES</i>
<i>Hazardous Waste Generator's Training</i>	<i>Read Only</i>
<i>Hazmat Handling/On-site Transportation</i>	
<i>Hearing Conservation</i>	<i>YES</i>

<i>Hoisting & Rigging (Classroom)</i>	<i>YES</i>
<i>Hoisting & Rigging (OJT)</i>	
<i>Integrated Safety Management</i>	<i>No</i>
<i>Ladder Safety</i>	<i>YES</i>
<i>Laser Safety</i>	<i>YES</i>
<i>Lead Safety</i>	<i>YES</i>
<i>Lockout/Tagout</i>	<i>YES</i>
<i>Machine Guarding</i>	<i>YES</i>
<i>NSTX Access</i>	
<i>Personal Protective Equipment</i>	<i>YES</i>
<i>Radiation Safety</i>	<i>YES</i>
<i>Respiratory Protection</i>	<i>YES</i>
<i>Scissor Lift (Classroom)</i>	<i>YES</i>
<i>Scissor Lift (OJT)</i>	
<i>Tritium Work Practices (donning & doffing)</i>	<i>No</i>
<i>Working Under the Vacuum Vessel During D&D</i>	<i>Read Only</i>

** Challenge testing only allowed in extreme emergency cases.*

Additional ES&H Controls

The following are additional ES&H Controls that should be considered for inclusion in the Statement of Work:

- State that the subcontractor's safety record will be considered in the proposal/bid evaluations. Request supporting information.*
- State that the subcontractor's number of injury/illness cases, in the last year or even longer, will be included in the proposal/bid evaluation requirements. Request supporting information.*

- *Work subcontracted by PPPL is frequently subcontracted to sub-tier contractors and, at times, sub-tier contracts are not known at the time of the initial subcontract award. The Statement of Work should address the method by which PPPL ES&H Requirements (imposed on the subcontractor) are subsequently applied to work performed by their sub-tier contractors.*
- *If the work is to be performed at D-Site, or some other restrictive area, state that a briefing by PPPL personnel on the unique safety requirements will be included in the Pre-Proposal/Pre-Bid Conference.*
- *Consider including a requirement for the Subcontractors to submit an Integrated Safety Management (ISM) Plan (examples of when this is appropriate include: subcontractor replacement of underground water pipes in the vicinity of electrical and gas utilities, and subcontractor inspection and repair of on-site cranes) Submittal of the ISM Plan should be required within a certain number of days of subcontract award. State that receipt of the Plan will be a condition of letting the Subcontractor begin on-site work. [PPPL review of the ISM Plan should be by the Cog/ATI/Construction Manager/requisitioner and an individual with an ES&H background. PPPL should review and approve the ISM Plan.]*

NOTE: An ISM Plan (Health & Safety Plan) per ESHD 5008, Section 1, Subsection 1.4.4 (http://bp.pppl.gov/ESHD_MANUAL/safety/sm1.pdf) must be provided for review and approval for all construction projects. This and other statements cited in Subsection 1.4.4 must be included in all SOWs for construction projects.

- *A statement that the subcontractor must inform its employees of the contents of their ISM Plan, including hazards and controls should also be included in subcontracts. This requires subcontractor to hold a pre-job briefing before starting on-site work. [Relying on "paper" alone is not the most effective way to convey requirements. The one-on-one conversations of an on-site pre-job brief are invaluable.] A Pre-Job Briefing form should be attached to the subcontract that must be signed prior to starting the job. A Job Hazard Analysis form signed by affected workers can be used as documentation of a pre-job brief. The JHA form can be found at the following web site:*

http://bp.pppl.gov/JHA_online.doc

- *Consider including a sample ISM Plan with the RFP/RFB.*
- *State that PPPL will monitor execution of the ISM Plan and subcontract compliance.*
- *Identify waste that is generated from work performed, construction, installation and or cleanup efforts. Specify type of waste generated for the purpose of reducing waste to landfill and separate by type. Specify contractor or PPPL PTR who is responsible for waste*

and recyclables generated. Contact Facilities and Site Services to ensure proper containers and size are available for the project. Dispose of waste and recyclables in the proper containers and provide weight for each category for contractors taking materials off site (e.g. scrap metal, clean wood, concrete, wires, asphalt, fill dirt etc.). Weight shall be provided in pounds or metric tons.

- For all cleanup efforts ensure that property items are excessed through material services. This includes furniture, computer related items and equipment. Those items will be inspected by Material Services to be excessed, sold, reused or properly disposed.*

9.0 QUALITY ASSURANCE REQUIREMENTS

9.1.

Provide a description of the quality assurances and controls that need to be implemented for this work. As appropriate, include a general statement such as "Work under this SOW shall be performed under an effective Quality Assurance Program. The Subcontractor shall maintain an effective Quality Assurance Program to assure that the Subcontractor's work meets the required quality and is performed in accordance with contractual requirements. Subcontractor's quality assurance function shall be actively involved in the planning, processing oversight, problem resolution, and determination of acceptability of all work under this SOW. The function shall be organized to have sufficient authority and independence to identify quality problems, verify conformance of supplied items or services to specified requirements and obtain satisfactory resolution of conflicts involving quality."

Select and include appropriate specific requirements from the list contained at:

<http://www-local.pppl.gov/qa/PQA/QAClauses.doc>

Consult Procurement Quality Assurance to assist in determining these requirements and agree upon general approach to supplier/subcontractor oversight.

10.0 SHIPPING STORAGE AND HANDLING

10.1.

Specify the requirements for packing (e.g., crating, pallets, accelerometers, nitrogen purge, desiccant, etc), shipping and handling of the component. Identify temperature and humidity storage requirements. Specify labeling to be placed on shipping container. Also identify requirement for receipt inspection, if necessary.

11.0 WARRANTY

11.1.

Identify if a warranty is required or desired and describe in detail.

12.0 ATTACHMENTS

12.1.

Provide a list of attachments, including each attachment referred to in the text of the SOW/specification. Attachments may include examples of documentation of similar work, done previously.

13.0 DOCUMENTATION & DELIVERABLES

Documentation deliverables required: List the required documents that must be delivered to fulfill the requirements. State "None" if there are no documents required.

SOWs that include environmentally preferable materials / products / services must include a requirement for vendor documentation of compliance with these requirements. Copies of the Document Deliverable Checklist for such procurements shall be provided to the Environmental Services Division (ESD) to facilitate Laboratory and DOE sustainability reporting. When Deliverable Is Required: Define a relative timeframe when the deliverable needs to be received.

Deliverable Format: Defines whether the specific deliverable will be maintained digitally or in paper format. It can also define the file type (PDF, Excel, PowerPoint, etc.) if you need to be that specific.

Deliverable Received: A check is placed in this column to designate receipt of that deliverable.

Storage Location for Deliverable: This defines where the master set of documents would be kept and where one would go to find the records for the SOW/Specification. The location may be dictated by project management or department policy. The Operations center can also be used. The records must be retrievable.

Exceptions: Use this area to justify when a Documentation Deliverable is not received and the order can still be closed. A justification must be given.

Notes / Exceptions – If a deliverable cannot be delivered and this is acceptable or if other exceptions occur, it must be noted and approved by the RLM when they sign off on the deliverables.

Deliverables List

PO / Subcontract / BOA / BPA #: _____

#	Physical Deliverables Required	When Deliverable Is Required	Deliverable Received (✓)
1			
2			
3			
4			
5			
Exceptions (Add justification for any missing physical deliverables that will not be received):			

#	Document Deliverables Required	When Deliverable Is Required	Deliverable format (paper, electronic etc.)	Storage Location for Deliverable	Deliverable Received (✓)
1					
2					
3					
4					
5					
Exceptions (Add justification for any missing document deliverables that will not be received):					

Princeton Technical Representative/COG: _____

(Sign-off and provide to the Operations Center when job is completed and deliverables are dispositioned and placed/filed in Operations Center (or other Project, Department or Division designated file center)

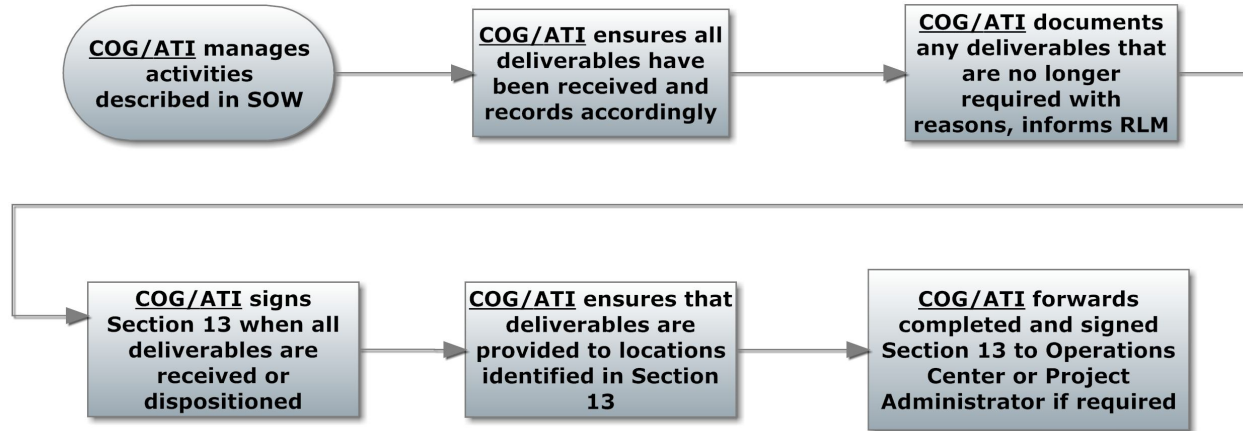
Statement of Work/Specification Deliverables Worksheet - Typical

Attachment 2

Statement Of Work/Specification Deliverables Worksheet

These are examples of items to consider when determining deliverables to require and list in the Documentation and Deliverables section of a particular Statement of Work or Specification (this worksheet is not part of the SOW itself.)

Hardware: <i>List hardware items and, for each item, select the tests documents, etc. from the right hand columns that you require.</i>		
1.	• Heat Treatment Charts	• Installation Plan
2.	• Dimensional Inspection Reports	• Qualifications and Certifications
3.	• Surface Quality	• Equipment Calibration History
4.	• Weld Inspection Reports	• Non-Conformance Reports
5.	• Visual Inspections	• Disposal Plan/Clean Up Plan
6.	• Electrical Test Reports	• Material Certifications
7.	• Non-Destructive Examination (NDE) Reports	• Radiographs
8.	• Mechanical Test Reports	• User Manuals
9.	• Performance Test Reports	• Repair Manuals
10.	• Performance Graphs / Charts	• Maintenance Manuals
11.	• Magnetic Permeability Reports	• Design data/calculations
12.	• Completed Travelers/Process sheets	• QA Plan
13.	• Preliminary Drawings	• As-Built Drawings
14.	• Environmental Preferred Products documents	
Software: <i>List software items and, for each item, select the tests documents, etc. from the right hand columns that you require.</i>		
1.	• Source Code	• User Manual
2.	• Stress Test Results	• Training Material
3.	• Testing Verifications	• Non-Conformance Reports
4.	• Code Documentation	• QA Plan
5.	• Installation Plan	
Research: <i>List research items and, for each item, select the tests documents, etc. from the right hand columns that you require.</i>		
1.	• Data (Define Format)	• Material Certifications
2.	• Research Results Report	• Procedure Plan
3.	• Analysis	• CRADA
4.	• Status Reports (Weekly/Monthly)	• Funding Procedure
5.	• Proposed Next Steps	• Equipment Calibration History
6.	• Patents	• Qualifications and Certifications
Safety and Health: <i>List ES&H items and, for each item, select the tests documents, etc. from the right hand columns that you require.</i>		
1.	• ISM Plan	• Digging Permit (PPPL ENG-024)
2.	• QA Plan	• Penetration Permit (PPPL ENG-028)
3.	• Welding Plan (PPPL ENG-037)	• Radiological Work Permit(PPPL ESH-008)
4.	• Lift Plan (PPPL ES-MECH-007)	• Confined Space Permit (PPPL IH-OP-24)
5.	• Hot Work Permit (see ESU)	• Inspection/Test Plans
6.	• Flame Permit (see ESU)	• Installation Plan
7.	• Air Permit (NJDEP)	• Soil Erosion Permit (FSCD)
8.	• Wetlands Permit (NJDEP)	•



ENG-006 R5 Section B
On-Site Activities