

<b>Development of Technical Requirements for Procurements</b>	<b>Manual Document Page Issue Date</b>	<b>Engineering TFC-ENG-DESIGN-C-34, REV C-4 1 of 23 July 29, 2020</b>
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Ownership matrix	RPP-27195
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## **1.0 PURPOSE AND SCOPE**

(7.1.2)

This procedure defines the Tank Operations Contractor (TOC) requirements associated with the preparation, review, approval, release, and revision of technical requirements for procurement of items (TFC-BSM-CP\_CPR-C-06) and services (TFC-BSM-CP\_CPR-C-05). These items and services include catalog items, developmental technology, engineered equipment, design/build procurements, and construction.

This procedure also describes the steps for developing TOC technical requirements for procurements as captured in Standalone Specifications, should they be needed for specific structures, systems, and components (SSCs).

While this procedure defines procurement steps for commercial grade dedication (CGD), it does not address the CGD process. For procurement of Commercial Grade Items or Services as safety significant (SS) structures, systems, and components (SSCs), using a Vendor/Supplier CGD service, refer to TFC-ENG-DESIGN-C-15, and for CGD of software, refer to TFC-ENG-DESIGN-C-65. When acquisition of computer software is involved, requirements of TFC-BSM-IRM\_HS-C-01 are applicable in addition to this procedure.

General procurement policies and practices are contained in TFC-BSM-CP\_CPR-C-09.

TOC specifications such as those for system level and subsystem level definitions should be developed according to TFC-ENG-DESIGN-C-01.

## **2.0 IMPLEMENTATION**

This procedure is effective on the date shown in the header. This procedure is applicable to the preparation of new TOC procurement technical requirements and revisions to existing TOC procurement technical requirements released on or after this procedure's implementation date.

## **3.0 RESPONSIBILITIES**

Technical requirements are the responsibility of Engineering and specifically the responsibility of the Design Authority (DA).

Specific responsibilities are contained within Section 4.0.

## **4.0 PROCEDURE**

This procedure addresses the engineering interface for procurement of items and services when Engineering receives a request for supporting procurement of services or items that need technical requirements definition.

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#### 4.1 Guidance for all Technical Requirements

(7.1.4, 7.1.10, 7.1.11, 7.1.14, 7.1.15)

The following requirements, as applicable, apply to technical requirements conveyed by Material Requisitions (MR), Enterprise Asset Management (EAM), and Purchase Requisitions (PR), Statements of Work (SOW) and Addenda, Procurement Specifications, or Equipment Data Sheet (EDS):

- Appropriate technical requirements shall be identified for catalog items, technology subject to maturation procurements, engineered equipment, and design/build and construction subcontracts. The following shall be considered:
  - Selection of the appropriate TOC engineering standard(s) that apply to the procured item
  - The technical or design requirements may be documented in an Engineering approved technical document identified by Table 1 of TFC-ENG-DESIGN-C-25
  - Development of technical requirements in accordance with TFC-ENG-DESIGN-C-57 (7.1.8, 7.1.7, 7.1.10)
  - A Modification Traveler (MT), as per TFC-ENG-DESIGN-C-56, must be developed for most modifications to SSCs in nuclear facilities. The MT defines design requirements and, when applicable, should be used as a source of technical requirements for procurement activities
  - A Design Requirements Compliance Matrix (DRCM), as per TFC-ENG-DESIGN-C-42, must be developed for Design Type I and II designs. Technical reviews must be conducted in accordance with the requirements of TFC-ENG-DESIGN-C-52. This includes all designs prepared by an external design agency
  - If external design agencies perform checking and verification, the respective contract/release contains requirements for these activities.
- All technical requirements shall be reviewed by Engineering, in consultation with QA, and approved by the cognizant Design Authority
- When specifying requirements for procurement, the Design Authority/Project Engineer shall ensure the specific codes/standards and regulation references selected for the item's design are included in the SOW or Code of Record (COR)
- The collection of applicable codes, standards, regulations, etc. are commonly referred to as the COR for the design. The COR includes those requirements invoked during the design phase and later used to initiate operations to ensure those requirements are available to all responsible parties during each life cycle, organizational, and mission change. They typically include:
  - Federal and state laws and regulations, U. S. Department of Energy (DOE) requirements, and specific design criteria defined by national codes and standards. This includes national codes and standards invoked through 10 CFR 830, "Nuclear Safety Management," 10 CFR 851, "Worker Safety and Health

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Program,” the design criteria in DOE O 420.1C, “Facility Safety,” or its successor directives, and applicable state and local building codes. While the standards listed in 10 CFR 851, Section 851.23(a) must be met, more recent editions of the standards may be used as long as the more recent standards are at least as protective as the edition specified in 10 CFR 851 (7.1.2, 7.1.3, 7.1.5, 7.1.7)

- For new projects connecting to existing facilities/systems, current editions of Codes and Standards should be used. New or revised requirements between the new and old facilities/systems shall be identified and managed in accordance with the change control process provided in TFC-ENG-DESIGN-C-57.
- Quality Assurance Program requirements and/or specific Quality Assurance criteria shall be identified for technical requirements and shall include the following, as applicable:
  - Criteria in technical requirements shall include inspection, surveillances, and reviews using Site Form A-6006-661, and be included with the procurement information
  - A graded approach shall determine the appropriate level of effort necessary to attain and document technical/quality requirements (see TFC-ESHQ-Q\_ADM-C-01). Table 1 shows the determination of Quality Levels.

**Table 1. Quality Level Determination.**

SSC Classification	Safety Class (SC)	Safety Significant (SS)	General Service (GS)
Nuclear Facility	QL-1	QL-2	QL-3
Non-nuclear Facility*	N/A	N/A	QL-0

\*Facilities Change Package criteria in accordance with TFC-ENG-DESIGN-C-67 must apply.

- The criteria in technical requirements shall include identification, prevention, evaluation, notification, and disposition of suspect/counterfeit items (see TFC-ESHQ-Q\_C-C-03) and include technical specifications, procurement quality clauses, documentation, and inspection requirements to prevent introduction of suspect/counterfeit items
- Measurements contained in engineering documents are written using English customary units as the main designator. The Engineering Level 1 Manager may approve the use of other units. The approval for the use of other units shall be documented. It is not required to show alternate units for a mathematical value. When International System of Units (SI) are used, they should be selected from the guidance of the National Institute of Standards and Technology
- Determine if the document contains (or is expected to contain) information that is To Be Determined (TBD) or if the document contains (or is expected to contain) information that cannot be used until verification has been completed (HOLD). Engineering TBDs/HOLDS included in specifications shall be identified in accordance with TFC-ENG-DESIGN-C-25 (7.1.7, 7.1.9)

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- If tools, measurement and test equipment (M&TE), or equipment are to be relocated between facilities or sent back to Vendor, process in accordance with TFC-BSM-CP\_CPR-C-18
- If a special tool needs to be procured, process in accordance with Attachment A
- If the procurement involves the evaluation of special tools and equipment, ensure the documentation of this evaluation is numbered and processed in accordance with TFC-ENG-DESIGN-C-25.

#### 4.2 Paths for Preparation, Release and Configuration Control of Technical Requirements

According to TFC-BSM-CP\_CPR-C-05, TFC-BSM-CP\_CPR-C-06, and TFC-BSM-IRM\_DC-C-07, two primary methods for defining procurement requirements (not technical requirements) are:

- Material Requisitions (MR), EAM, or Non-safety Purchase Requisitions (PRs) generated in an electronic procurement system and typically result in a purchase order or purchase-card transaction.
- Statement of Work (SOW) generated using the templates found on the Procurement website and result in a Subcontract award.

Generally, design services are procured using the SOW approach and items/materials are procured using a MR or EAM approach. However, the approaches listed above provide the ability to include attachments and/or references to other documents, including engineering documents. These documents contain technical requirements such as MTs, specifications, drawings, calculations, etc. Suitability of attachments for the approaches is broken down into four paths as depicted in Figure 1. Applicable attachments through each of the four paths for conveying technical requirements are depicted in Figure 1.

Where possible, technical requirements for procurement should be captured through one of the four paths depicted in Figure 1. Figure 1 may be used as a guide to determine the most suitable method for conveying technical requirements. However, the DA shall make the final decision. The technical requirements conveyed via the four paths include: (7.1.1, 7.1.5, 7.1.7)

- Path 1: Material Requisitions, EAM, or Purchase Requisition;
- Path 2: SOW Addenda;
- Path 3: For procurements with complex procurement, project management, and/or technical requirements requiring design services, a standalone specification should be developed in accordance with Attachments B, C and D; or
- Path 4: General Equipment Procurement Specification (general specification) and EDS.

To choose the appropriate path on Figure 1, the criteria below for conveyance of technical requirements, is provided:

- Path 1: Include item identification in MRs, EAMs and PRs. As appropriate, an MR, EAM, and PR may also be used when minimal technical requirements beyond item identification (such as a catalog number) are required. Non-safety PRs, which are used to purchase off-the-shelf items and spare parts, will contain item identification (such as a catalog number) within the respective document; there is no requirement for additional technical requirements

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- Path 2: As illustrated, a SOW Addenda should be used when procurement and/or project management requirements require more information than can be captured through MRs, EAMs, and PRs alone. Requirements for design/build subcontracts are processed in conjunction with a statement of work prepared in accordance with TFC-BSM-CP\_CPR-C-03 using a Design/Build Statement of Work template
- Path 3: For procurements with complex procurement, project management, and/or technical requirements requiring design services, a standalone specification should be developed in accordance with Attachments B and C of this procedure and/or a MT in accordance with TFC-ENG-DESIGN-56
- Path 4: For procurements involving routinely procured items, generalized procurement specifications have been produced that coincide with EDS. EDS capture design inputs for specific components used in projects, systems, and/or facilities. EDS are found as SmartPlant Foundation Non-Mapped Word Templates.

Development of technical requirements for MRs, EAMs, and PRs is given in Section 4.2.1. Section 4.2.2 describes the steps needed to prepare and release technical requirements found in a SOW Addendum. Steps for development of standalone specifications supporting procurement are listed in Section 4.2.3. Section 4.2.4 describes the process for capturing technical requirements in general procurement specifications and EDS or just EDS if the specification already exists. Section 4.3 describes the General Control of Changes for Technical Requirements. Guidance for Construction specifications are provided in Section 4.4. Procurement of Safety Significant (SS) items or services from an evaluated supplier using Vendor/Supplier CGD services is found in TFC-ENG-DESIGN-C-15. Guidance on the development submittals is located in TFC-BSM-IRM\_DC-C-07.

**4.2.1 MRs, EAMs, and PRs: Preparation, Release, and Configuration Control of Technical Requirements (Path 1, Figure 1)**

MRs and EAMs shall be prepared in compliance with TFC-BSM-CP\_CPR-C-06.

Non-safety PRs are used to purchase off-the-shelf items and spare parts and no requirements are needed to specify additional technical requirements. For spare parts, refer to TFC-BSM-CP\_CPR-C-19 for guidance.

All change control of technical requirements shall be performed according to Section 4.3 of this procedure.

**4.2.2 SOW Addenda: Preparation, Release, and Configuration Control of Technical Requirements (Path 2, Figure 1)**

Requirements for design/build subcontracts are processed in conjunction with a statement of work prepared in accordance with TFC-BSM-CP\_CPR-C-03. For procurements requiring simple technical requirements, the technical requirements can be documented in an attachment to the SOW (SOW Addenda).

Technical requirements that may be included in the SOW are limited to TOC standards, procedures, and references to specifications or MTs previously approved by Engineering. Technical requirements other than those identified above shall not be included within the SOW.

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Supplemental technical requirements are to be documented in an Engineering approved technical document, as SOW Addenda.

Technical requirements incorporated as a SOW Addenda, shall be prepared to document requirements, such as design, performance, fabrication, installation, testing, quality assurance, packaging, storage, and shipping.

- Originator
1. Develop a SOW according to TFC-BSM-CP\_CPR-C-05 in conjunction with Buyer’s Technical Representative (BTR), Manager, Requestor, and Subject Matter Experts (SMEs).

NOTE: All Engineering drawings included in the SOW Addenda shall be prepared and reviewed in accordance with TFC-ENG-DESIGN-C-09.

- Design Authority/Project Engineer
2. Complete the necessary SOW Addenda.
    - a. Review all engineering calculations, documents supporting the Addenda, and design information in the Addenda shall be reviewed and released according to TFC-ENG-DESIGN-C-25.

- Originator
3. Review and approve the technical requirements prior to them being attached to the SOW.
  4. Perform all change control of technical requirements in accordance with Section 4.3 of this procedure.

#### 4.2.3 Standalone Specifications, MTs: Preparation, Release, and Configuration Control of Technical Requirements (Path 3, Figure 1)

(7.1.11, 7.1.12)

As MTs and specifications are Engineering documents, the development, review, issuance, and change control of each specifications is the responsibility of Engineering.

The format and contents of specifications should follow the guidelines given in Attachment B. Sections that are not applicable or are not labeled as “Required” may be deleted and the subsequent sections renumbered. The items in Attachment C should be considered for inclusion in specifications.

- Originator
1. Develop a specification according to Attachment B in conjunction with the BTR/STR, Manager, Requestor, and Subject Matter Experts (SMEs).

- Design Authority/Project Engineer
2. Ensure all technical requirements are captured.

- Design Authority
3. If QA requirements are going to be captured in Engineering technical requirements, consult with the QAE.

- Design Authority/Project Engineer
4. Review and release all engineering calculations, documents supporting the Addenda, and design information in the Addenda in accordance with TFC-ENG-DESIGN-C-25.

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5. Ensure Vendor Calculation Reports comply with TFC-ENG-STD-51.
6. Prepare and review all Engineering drawings in accordance with TFC-ENG-DESIGN-C-09.

Originator

7. Perform change control of technical requirements in accordance with Section 4.3.

#### 4.2.4 General Equipment Procurement Specifications and EDS: Preparation, Release, and Configuration Control of Technical Requirements (Path 4, Figure 1)

As general equipment procurement specifications (general specifications) are engineering support documents, the development, review, issuance, and change control of each specification is the responsibility of Engineering.

The format and contents of general specifications should follow the guidelines given in Attachment B. Sections that are not applicable or are not labeled as “Required” may be deleted and the subsequent sections renumbered. The items in Attachment C should be considered for inclusion in general specifications. For all general specifications, an EDS must be attached. EDS are an attachment to a general specification that contains project, system, or facility specific design requirements and performance criteria. Example EDS may be available as SmartPlant Foundation Non-Mapped Word Templates. EDS may be revised without revising the associated General Procurement Specification given appropriate project needs.

Originator

1. Determine if a general specification exists to support the procurement of the SSC needed.
  - a. If a general specification has been produced with the desired application, proceed to step 6. Otherwise, continue to Step 2.
2. Develop a general specification according to Attachment B.

NOTE: Existing EDS examples and instructions are posted on the SPF Non-Mapped World Templates link.

3. Develop a corresponding project, system, or facility specific EDS in conjunction with the DA and SMEs.

Design Authority/Project Engineer

4. Ensure all technical requirements are captured within the general specification and associated EDS.

Design Authority

5. If the QA requirements are going to be captured in Engineering technical requirements, consult with the QAE.

Design Authority/Project Engineer

6. Review and release all engineering information supporting the specification and EDS, and design information in the EDS according to TFC-ENG-DESIGN-C-25.

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- Originator
7. Complete the EDS in accordance with the form instructions based on specific technical requirements for the application.
  8. Review and release the EDS according to TFC-ENG-DESIGN-C-25.
  9. Perform all change control of technical requirements according to Section 4.3 of this procedure.

### 4.3 General Control of Changes for Technical Requirements

- Design Authority/Project Engineer
1. Prepare revisions if changes to released specifications, drawings, calculations and/or EDS are identified.
  2. Control changes to released engineering documents, drawings, calculations and/or EDS in accordance with TFC-ENG-DESIGN-C-25. (7.1.5, 7.1.7)
  3. Ensure that all affected parties are notified of changes in technical requirements.

NOTE: Depending upon the complexity, the technical description could be a standalone specification or a simpler approach, as shown in Figure 1. (7.1.5)

4. Revise all other related/referenced specifications to incorporate changes when deemed necessary for safe operations.
5. Maintain specifications required for safe operation of a facility in a formal, real-time incorporation status (configuration control).

NOTE: Step 6 must be completed in the case of technology maturation procurement, after qualification testing and prior to field deployment.

6. Update the initial SOW and performance/functional criteria with a revised technical description of the technology.

### 4.4 Construction Specifications

The following additional requirements and recommendations apply to construction specifications:

- The format and contents of construction specifications shall comply with the Construction Specification Institute (CSI) Manual of Practice (MP-1), which contains editorial and content guidelines and provides excerpts from sample specifications to illustrate text being explained. The master format section in the Construction Specifications Institute Manual of Practice provides standard section titles and numbers
- Construction specifications shall be prepared to document the needed requirements for site installation, such as product delivery, handling, and storage, execution of site work, type(s) of materials, acceptance criteria, submittal and documentation requirements, and the quality of workmanship. The minimum requirements shall be clearly and concisely stated and consistent with the intended use. Existing designs and specifications, updated

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to include current requirements, shall be used where appropriate. Construction specifications must also consider and implement, as appropriate, energy and natural resource conservation, waste minimization via source reduction and engineering controls, and pollution prevention in accordance with 10 CFR 436 and 42 USC Chapter 149, as applicable. (7.1.1, 7.1.4, 7.1.6, 7.1.7, 7.1.8, 7.1.10, 7.1.11)

- Construction specifications that include welding shall contain the welding requirements and/or symbology, and Welding Procedure Specifications/Procedure Qualification Records (WPS/PQR), and the requirement to include the Quality Assurance (QA) quality clauses for Welding/Non-Destructive Examination (NDE) submittals in Statements of Work/Purchase Orders (PO) that include Welding/NDE, and to ensure these submittals are reviewed and approved by the applicable Subject Matter Experts (SME)
- Alternately, construction specifications may be written using a number of different specifying methods, which include descriptive specifications, performance specifications, reference standards, and proprietary specifications. Refer to the Construction Specifications Institute Manual of Practice for more information.

#### 4.5 Procurement of Safety Significant Items or Services, and Materials using a Vendor who has a TOC Approved Commercial Grade Dedication Program

The following outlines the specific steps necessary to obtain the Safety Significant (SS) items or services from an evaluated supplier using Vendor/Supplier CGD services.

- |   |   |
|---|---|
| Design Authority/Project Engineer           | 1. Ensure the Vendor is on the Evaluated Supplier List (ESL) and has been approved to perform commercial grade dedication to the requirements of ASME NQA-1-2008 including NQA-1a-2009 addenda.   |
| Design Authority/Quality Assurance Engineer | <p>2. Include the following information in all procurement documents for SS items or services for which the Vendor will perform commercial grade dedication.</p> <ul style="list-style-type: none"> <li>• This information should be separately provided to the vendor (<b>SELLER</b>), if sufficient space is not available on standard forms (e.g., Material Requisition): <ul style="list-style-type: none"> <li>– Identification of the safety function and critical characteristics for acceptance of the item, or service</li> <li>– A requirement for the Vendor to perform CGD at the <b>SELLER's</b> sub-tier suppliers' sites, if applicable</li> </ul> </li> <li>• A requirement for TOC review and approval of the Vendor's commercial grade dedication plan. The review and approval shall be performed by the Design Authority/designee, Quality Assurance Engineer/Quality Assurance Representative, and Procurement Engineering manager/designee</li> </ul> |
| Procurement Engineering                     | 3. Perform a Procurement Engineering Evaluation of the items after they are entered into the Electronic Procurement System in accordance with TFC-ENG-DESIGN-C-15.  |

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4. Submit the completed dedication package, including all supporting documentation, for TOC review and approval as verification of the critical characteristics for acceptance of the item, or services have been met prior to shipment of the item or after completion of the service.

Design  
 Authority/Quality  
 Assurance Engineer/  
 Procurement  
 Engineering  
 Manager/  
 Engineering Manager

5. Review and approve the completed dedication package.

## 5.0 DEFINITIONS

Cleanness Classification. Four classes of surface cleanness (Classes A, B, C, and D) are provided. The cleanness class applicable to the item or specific part shall be established and specified in the applicable drawings, specifications, or other appropriate documents. Different cleanness classes may be assigned to internal and external surfaces, or to different parts of the same item based on the cleanness needs of the specific item.

- Class A cleanness is a very high level, generally applicable to special items whose functions might be impaired by the presence of very small quantities of contaminants.
- Class B cleanness is a high level, generally applicable to internal surfaces of corrosion-resistant alloys in contact with process fluids in fuel manufacturing, and other similar applications.
- Class C cleanness is a high level of initial cleanness, generally applicable to carbon steel and low alloy steel surfaces in contact with fluids where the formation of light corrosion product films in service is expected and can be tolerated.
- Class D cleanness is a nominal level applicable to both carbon and low alloy steels and the corrosion-resistant alloys in applications where the presence of mill scale or tightly attached heavy corrosion product films on the surfaces in contact with process fluids does not cause concern, or where significant amounts of contamination are anticipated to be present in the process fluids themselves. (7.1.9, 7.1.13)

Code of Record (COR). A COR contains, or references, requirements that directly affect the public, facility worker, environment or nuclear safety; engineering disciplines, including civil, structural, mechanical, electrical, instrumentation and control, piping, and fire protection; and management systems including safety, security, and quality assurance. The COR includes Federal and state laws and regulations, DOE requirements, and specific design criteria defined by national codes and standards. This includes national codes and standards invoked through 10 CFR 830, “Nuclear Safety Management;” 10 CFR 851, “Worker Safety and Health Program;” the design criteria in DOE O 420.1C, “Facility Safety,” or its successor directives; and through applicable state and local building codes. While the standards listed in 10 CFR 851, Section 851.23(a) must be met, more recent editions of the standards may be used as long as the more recent standards are at least as protective as the edition specified in 10 CFR 851. (7.1.2, 7.1.3, 7.1.5, 7.1.7)

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General Equipment Procurement Specification. A specification that includes fundamental requirements, applicable codes and standards for SSCs. Project, system, or facility specific design criteria and performance requirements are found in the accompanying Equipment Data Sheet.

New facility construction must conform to both the national consensus industry standards and the model building codes, e.g., International Building Code (IBC) and National Fire Protection Association (NFPA), for Washington State. However, Washington State requirements, which would reduce safety, conflict with other DOE requirements, or increase risks at TOC facilities, may not be adopted unless they have demonstrated a commensurate benefit to DOE and DOE approval has been obtained.

Equipment Data Sheet (EDS). An attachment to a General Equipment Procurement Specification that contains project, system or facility specific design requirements and performance criteria. EDS may be revised without revising the associated General Procurement Specification given appropriate project needs.

EDS may be available as SmartPlant Foundation Non-Mapped Word Templates. These templates are located under the “SPF Forms and Instructions” tab.

Graded Approach. A process by which the level of analysis, verification/validation, documentation, and actions are determined based on safety, quality and/or project risk. This approach shall determine the appropriate level of effort necessary to attain and document the technical/quality requirements.

Safety Significant Structures, Systems and Components. Safety-significant structures, systems, and components are the structures, systems, and components that are not designated as safety class structures, systems, and components, but whose preventive or mitigating functions are a major contributor to defense in depth and/or worker safety as determined from safety analyses. (10 CFR Part 830)

## 6.0 RECORDS

The following records may be generated in the performance of this procedure:

- Statement of Work and Addenda
- General and Standalone Specifications
- Equipment Data Sheets.

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM\_DC-C-02.

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## 7.0 SOURCES

### 7.1 Requirements

- 7.1.1 10 CFR 436, "Federal Energy Management and Planning Programs."
- 7.1.2 10 CFR 830, "Nuclear Safety Management."
- 7.1.3 10 CFR 851, "Worker Safety and Health Program."
- 7.1.4 Correspondence No. 1002646 (DOE-OPR: 10-ESD-026), "Forwarding of the U.S. Department of Energy (DOE), Office of River Protection, Office of Environmental Management Interim Policy, "Code of Record (COR) for Nuclear Facilities."
- 7.1.5 DOE O 252.1A, "Technical Standards Program."
- 7.1.6 DOE O 413.3B, "Program and Project Management for the Acquisition of Capital Assets."
- 7.1.7 DOE O 420.1C, "Facility Safety."
- 7.1.8 DOE/RL-92-36, "Hanford Site Hoisting and Rigging Manual."
- 7.1.9 Department of Energy, Office of Nuclear Safety and Environmental Policy, Technical Position NSEP-TP-2007-1.
- 7.1.10 RPP-PLAN-39434, "Construction and Acceptance Testing Program," Section 5.1, "Verification and Approval."
- 7.1.11 RPP-PLAN-39434, "Construction and Acceptance Testing Program," Section 5.2, "Acceptance Test Plans and Procedures."
- 7.1.12 TFC-ENG-STD-51, "Vendor Calculation Standard."
- 7.1.13 TFC-PLN-02, "Quality Assurance Program Description."
- 7.1.14 TFC-PLN-03, "Engineering Program Management Plan."
- 7.1.15 TFC-PLN-90, "Technology Maturation Management Plan."

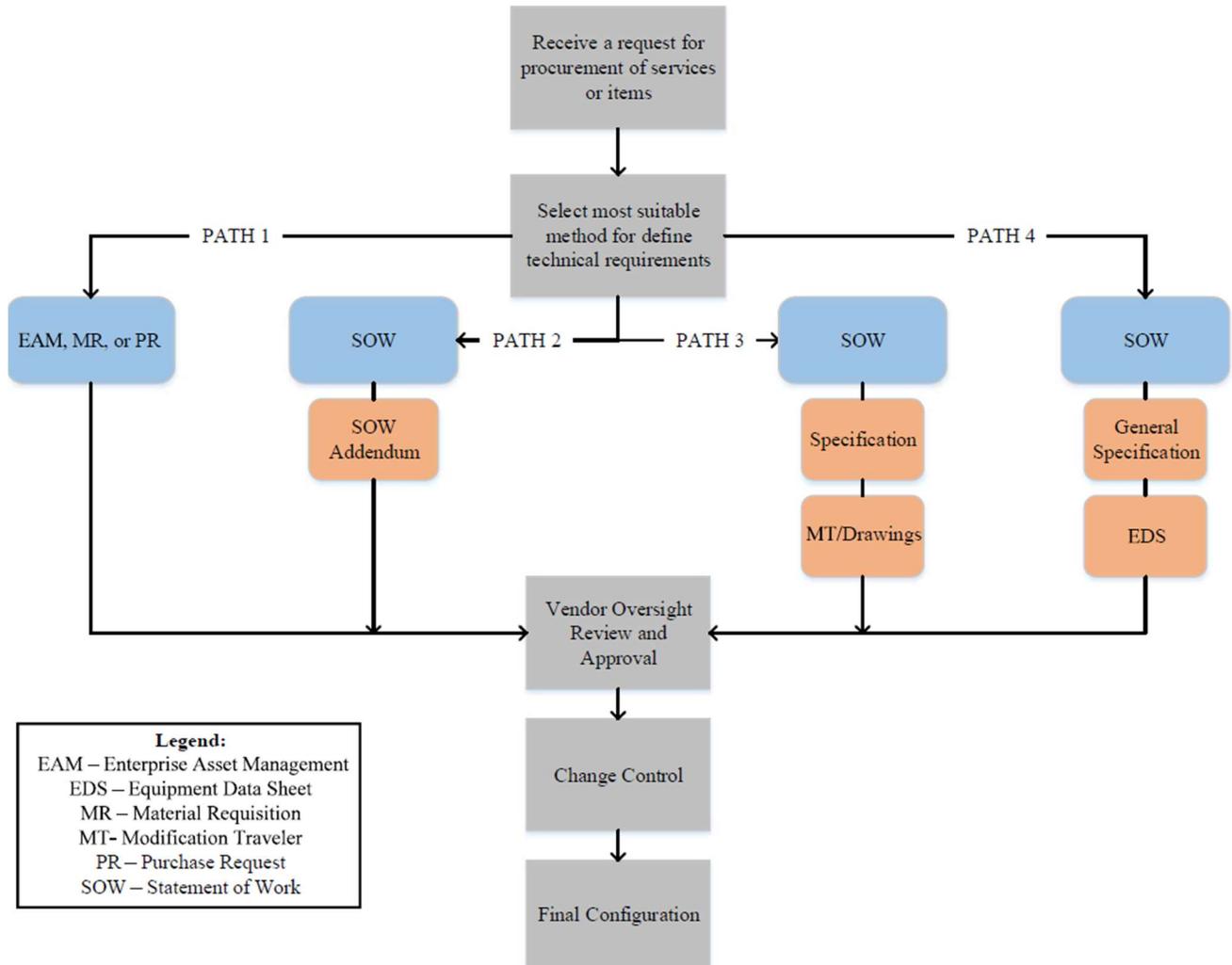
### 7.2 References

- 7.2.1 42 USC 15801, "Energy Policy Act of 2005."
- 7.2.2 MP-1, "Manual of Practices," Construction Specification Institute, Alexandria, Virginia.
- 7.2.3 TFC-BSM-CP\_CPR-C-03, "Buyer's/Subcontractor's Technical Representative."
- 7.2.4 TFC-BSM-CP\_CPR-C-05, "Procurement of Materials and Services."
- 7.2.5 TFC-BSM-CP\_CPR-C-06, "Procurement of Materials."

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- 7.2.6 TFC-BSM-CP\_CPR-C-09, "Supply Chain Process."
- 7.2.7 TFC-BSM-CP\_CPR-C-18, "Material Control."
- 7.2.8 TFC-BSM-CP\_CPR-C-19, "Controlling Spare Parts Inventory."
- 7.2.9 TFC-BSM-IRM\_DC-C-02, "Records Management."
- 7.2.10 TFC-BSM-IRM\_DC-C-07, "Vendor Processes."
- 7.2.11 TFC-BSM-IRM\_HS-C-01, "Software Development, Implementation and Management."
- 7.2.12 TFC-ENG-DESIGN-C-15, "Commercial Grade Dedication."
- 7.2.13 TFC-ENG-DESIGN-C-25, "Technical Document Control."
- 7.2.14 TFC-ENG-DESIGN-C-42, "Design Requirements Compliance Matrix."
- 7.2.15 TFC-ENG-DESIGN-C-52, "Technical Reviews."
- 7.2.16 TFC-ENG-DESIGN-C-56, "Modification Traveler."
- 7.2.17 TFC-ENG-DESIGN-C-57, "Development and Maintenance of Code of Record."
- 7.2.18 TFC-ENG-DESIGN-D-13.2, "Guidance for Applying Engineering Codes and Standards to Design."
- 7.2.19 TFC-ENG-STD-10, "Drawing Standard."
- 7.2.20 TFC-ESHQ-Q\_ADM-C-01, "Graded Quality Assurance."
- 7.2.21 TFC-ESHQ-Q\_C-C-03, "Control of Suspect/Counterfeit Items."
- 7.2.22 TFC-PLN-123, "Integrated Environmental Management System Description."
- 7.2.23 TFC-PLN-125, "Sustainable Program Plan."

**Figure 1. Flowchart of Technical Requirements Definition.**



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### ATTACHMENT A - SPECIAL TOOLS

NOTE 1: The person that initiates the request for a special tool is responsible for ensuring that an ergonomic evaluation and hazard analysis is performed.

NOTE 2: Tools that are procured with integral software code (embedded software or firmware) are to be used in accordance with this procedure and vendor instructions. If any change to the embedded software or firmware source code is required (other than changes formally supplied by the vendor), then software modification must be managed in compliance with TFC-ENG-DESIGN-P-12. A functional test is required to ensure the tool performs its intended function whenever the integral software code is modified. If any testing is necessary, it should be performed to the source procedure that was used for the acquisition.

- |                              |  |
|------------------------------|--|
| Requestor/<br>Engineering    | 1. Using site form A-6003-129, justify the need for a special tool (i.e., special tools include any site fabricated tool or commercially obtained [off the shelf] tool that requires modification prior to use).   |
| Engineering                  | 2. Determine functional requirements as the tool is planned to be used.<br><br>3. Determine performance requirements.<br><br>4. Provide design media (photo, sketch, cut-sheet etc.) with delineated modification.   |
| Safety and Health            | 5. With input from the user and Engineering, perform a hazard analysis regarding the use of the tool and identify any controls necessary to mitigate hazards identified.<br><br>6. Perform an ergonomic evaluation of the tool and its intended use and identify any actions or controls necessary to mitigate or eliminate any issues identified. |
| Engineering                  | 7. Release the evaluation as a RPP, hazard analysis, and ergonomic assessment in accordance with TFC-ENG-DESIGN-C-25.  |
| Work Planning/<br>Procedures | 8. Ensure controls identified from the hazard analysis or ergonomic evaluation are incorporated into the work order/procedure or Standing JHA as appropriate.<br><br>9. If the integral software has been modified as described in note 2 above then specify that a functional test of the special tool is required.                               |

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**ATTACHMENT B – SAMPLE SPECIFICATION**

The sample specification template is posted on the Forms & Instructions  
SmartPlant® Foundation website.

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## ATTACHMENT C – ITEMS FOR INCLUSION IN SPECIFICATIONS

The following provides items to be considered for completeness of the specification. Depending on the nature of the specification and procurement process, items may alternatively be included in other procurement documents or may be deemed not applicable to the specification.

1. Scope.

- The scope is clearly defined and is consistent with the Statement of Work.
- Requirements are appropriate for the item.
- Limited “extra” information is provided.

2. Requirements and References.

- Requirements are clearly defined.
- As-is conditions, interfaces, and tie-ins are clearly defined and are physically field verified or required to be verified.
- Requirements of the new item/equipment due to restrictions on interfaces with existing equipment, or new equipment provided by other vendors. Such restrictions may include: maximum operating pressure, minimum/maximum flow rate, minimum/maximum operating temperatures, maximum attached equipment weight, available electrical load supply, electrical phase and voltage, structural load limits, maximum allowable movement, vibration limits, electromagnetic interference (EMI) limits, compatibility of electronic protocols, and compatibility of physical interfaces.
- Requirements of the new item/equipment due to conditions imposed on interfaces by existing equipment, or new equipment provided by other vendors. Such conditions may include, but are not limited to: movement, vibration, thermal load, weight bearing requirements, pressure, etc.
- Performance requirements are used where appropriate with an appropriate level of detail.
- Technical requirements, salient features, and critical characteristics are defined in measurable and verifiable terms with acceptance limits and requirements, including tolerances.
- Special requirements are addressed and specified, if appropriate (shelf life, long-term storage, barriers, lifting points, lifting devices, etc.).
- Requirements for personnel qualifications or certifications are specified where required by applicable codes and standards.
- Submittals of special process procedures for review are specified.
- Quality requirements are defined and appropriate for procurement level and risk to project or reference is made to the document that defines the quality requirements.
- Critical design and quality assurance hold points and witness points are defined.

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**ATTACHMENT C – ITEMS FOR INCLUSION IN SPECIFICATIONS (cont.)**

- Deliverables are clearly defined.
- Partial shipments of equipment parts, components and subassemblies are defined and include acceptance criteria.
- Supplemental requirements of the codes and standards are incorporated, as appropriate.
- National codes and standards and TOC standards governing the work, and other references, are identified (Ref. TFC-ENG-DESIGN-D-13.2), including notes and/or specific code cases, particularly for safety significant equipment.
- Requirements in one section are not in conflict with requirements in others.
- Tests (including bench tests), standards, and inspection plans necessary to demonstrate performance requirements are included and contain acceptance criteria and appropriate tolerances.
- Performance attribute verification requirements are clearly defined and implement developed QA Inspection Plans (QAIP).
- Compliance reviews (e.g., National Electric Code) are developed and included.
- Submittals are linked to technical requirements.
- References are used appropriately.
- There are no conflicts or ambiguities in the references.
- Specific revisions to codes, standards, and other references are used.
- Drawings and sketches contain sufficient detail to define expectations, including fabrication specifications (e.g. welding requirements and symbology detail).
- The specification is consistent with the statement of work.
- Documentation and approvals.
- Applicable quality assurance program documentation is submitted to TOC for review and approval prior to commencement of work.
- Quality Assurance Inspection Plans including critical design and quality assurance hold points and witness points are submitted to TOC for review and approval.
- Those records that the supplier is to maintain are identified, the retention period is stated and it is stated that they shall be accessible to project, as applicable.
- Records to be submitted are defined and the schedule for submittal of the records is established and consistent with partial shipments defined.

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**ATTACHMENT C – ITEMS FOR INCLUSION IN SPECIFICATIONS (cont.)**

- Lessons learned from previous design or operating experience with similar equipment are considered and incorporated as applicable into the design.
- Compliance with manufacturer’s specific installation instructions/guidance with respect to similar installation configurations is addressed.
- Equipment reliability/functionality experience from available testing records for similar equipment is addressed.
- Unique location/configuration considerations that may impact installation or operability are addressed.
- Design requirements for accessibility/maintainability are addressed.
- Design requirements for ease of testing and or calibration during installation and operation are addressed.

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## ATTACHMENT D – PROJECT MANAGEMENT GUIDANCE

The following guidance is provided to assist with project management for procurement of SSCs.

### Submittals Required with Proposal – *Optional*

<b>Item</b>	<b>Title</b>	<b>Description</b>
1	Preliminary Drawing and Documentation List	List of drawings and documentation that will be provided in completion of the contract.
2	Quality Assurance Program	Copy of <b>SELLER</b> Quality Assurance (QA) Program.
3	Identification of Subcontractors	List of all proposed subcontractors. The <b>SELLER</b> shall flow down all requirements to subcontractors, as applicable.
4	Preliminary Schedule	Summary of activities required to design, fabricate, test, and ship the equipment.

### Submittals Required after Receipt of Order – *Optional*

<b>Item</b>	<b>Title</b>	<b>Description</b>
5	Configuration Drawing	Drawing detailing all major components and orientation.
6	Preliminary System Performance Analysis	Preliminary performance evaluation including equipment sizing analysis.
7	Code Deviations	All deviations to the codes identified within this Specification shall be clearly identified.
8	Work Plan	A work plan shall be submitted per Attachment A, Section 6.1.
9	Detailed Schedule	A detailed schedule showing the activities required to design, fabricate, test, and ship the equipment; including submittals and major procurements (long lead items).

### Submittals Required Prior to Fabrication – *Optional*

<b>Item</b>	<b>Title</b>	<b>Description</b>
10	Fabrication Drawings	All fabrication drawings including manufacturer standard details associated with the fabrication and assembly drawings shall be submitted. Assembly drawings shall include detail parts list with manufacturer part numbers and associated ASTM standard, dimensional layouts and details, welding symbols, details, and notes. Drawings shall include dimensions, required clearances, part number callouts, connection sizing, and operating weight of the equipment. Drawings must identify the location of access doors.
11	Factory Test Procedures	Test procedures shall be submitted for review and approval for all factory tests.
12	Vendor Equipment Sheets	<b>SELLER</b> shall submit product data and rated capacities/efficiencies of selected equipment and accessories.
13	System Performance Analysis. Stress and Structural Analysis Calculations	<b>SELLER</b> shall provide a system performance evaluation, including equipment sizing analysis, indicating compliance with the performance requirements identified in this Specification.

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**ATTACHMENT D – PROJECT MANAGEMENT GUIDANCE (cont.)**

<b>Item</b>	<b>Title</b>	<b>Description</b>
14	Welding and NDE	All Welding Procedure Specifications and Procedure Qualification Records shall be submitted for review and approval. All NDE Procedures as well as certified records of qualified personnel who will perform or verify the welding or NDE shall be submitted by the <b>SELLER</b> .
15	Authorization to Start Fabrication	The <b>SELLER</b> shall not start fabrication until written authorization has been received from the <b>BUYER</b> .
16	Packaging , Storage, Shipping, and Load Handling Plan	<b>SELLER</b> shall submit a PSSH Plan for approval by the <b>BUYER</b> . The PSSH plan shall include all plans, procedures, and drawings that address how items will be packaged, stored, shipped, and handled in accordance with the requirements described throughout this specification. The plan shall be prepared per RPP-8360.
17	Cleaning Records	During/after fabrication and prior to packaging and shipment cleaning records must record cleaning performed according to cleanliness level as specified in Section 4.2 of Attachment B.
18	Lifting and Rigging Plan	<b>SELLER</b> shall provide a Lift and Rigging Plan to cover the lifting and handling instructions for each lifted item (entire package as well as individual items that are uncrated). The plan shall describe the lift points, special lifting devices and/or hardware needs, and lift diagrams.
19	Site Assembly Instructions	<b>SELLER</b> shall provide site assembly instructions, including unpacking and installation drawings.
20	Equipment Interface Description	<b>SELLER</b> shall provide a description of the acceptable range of operating conditions and/or restrictions for interfaces with interrelated items or equipment not provided by the <b>SELLER</b> .
21	Calculations	Preliminary calculations shall be provided for review. Calculations may include (but are not limited to): structural calculations, lifting lug calculations, performance calculations, and etc.

**Submittals Required for Contract Completion – *Optional***

The **SELLER** shall not ship the equipment until all tests and inspections have been performed and the documentation data package is complete and approved by the **BUYER**. The **SELLER** shall notify the **BUYER** three weeks before the intended shipping date. The **SELLER** shall allow the **BUYER** one week after receiving the package and before shipment to review the data package.

<b>Item</b>	<b>Title</b>	<b>Description</b>
22	As Built Drawings and Specifications	The <b>SELLER</b> shall deliver to the <b>BUYER</b> one (1) hard copy and one (1) electronic file in PDF format of the final fabrication level as-built drawings and specifications accurately depicting the product delivered. Drawings shall include dimensioned layouts, dimensioned subassemblies, dimensioned component details, material and fastener size, descriptions, dimensioned interface locations including uncertainty/tolerances, weld symbols and notes. The designer’s name, responsible engineer’s name, EAM, and drawing number shall appear on the index (cover sheet).

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**ATTACHMENT D – PROJECT MANAGEMENT GUIDANCE (cont.)**

<b>Item</b>	<b>Title</b>	<b>Description</b>
23	Equipment Interface Description	<b>SELLER</b> shall provide a description of the acceptable range of operating conditions and/or restrictions for interfaces with interrelated items or equipment not provided by the <b>SELLER</b> .
24	Calculations	Reviewed and approved calculations shall be legible and prepared on 8 ½ inch by 11 inch sheets with all pages numbered and bound in a hard copy binder.
25	Inspection and Testing Reports	Inspections, examinations, testing and NDE activities shall be documented and the documentation delivered before shipment of the product. Inspection reports shall provide actual inspection results, specifying what was inspected, who inspected it, the characteristics that were inspected, and the acceptance criteria. All test requirements called out in <b>specification(s)</b> and fabricator drawings shall be documented in the testing reports.
26	Certified Material Test Reports	Certified Material Test Reports (CMTRs) shall be provided for the material used in welding applications.
27	Welding	Welding documentation shall be submitted in accordance with the requirements of Section 4, Weld Inspection Requirements, prior to shipping.
28	Procedures for Repair	The <b>SELLER</b> shall submit the procedures for repairs of rejected items or parts.
29	Spare Parts List	The <b>SELLER</b> shall provide a list of all Spare parts, identifying each specific subassembly to which it applies.
30	Certificate of Conformance	The Certificate of Conformance shall identify the contract requirements met, including reference to codes, standards and specifications, written change orders, and any <b>BUYER</b> -approved Contractor Non-Conformance Requests. The Certificate of Conformance shall describe the quality assurance function and position of the person attesting to its accuracy. Documentation shall conform to QA-AVS B79, "Certificate of Conformance."
31	Warranty Information	The <b>SELLER</b> shall provide their warranty offer.
32	Maintenance Manuals	Manuals shall be provided including recommended lubrication details for bearings, etc. including grease type, volume, and lubrication frequency as well as, bolt torque requirements, and hoisting and rigging sequences.