

EFCOG White Paper

Benchmarking of Engineered Procurement Effectiveness Elements

By the

Energy Facilities Contractors Group

Safety Working Group

Quality Assurance

Procurement Engineering Quality Task Team



E-SG-QA-PEQ-2021-01, Revision 0

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Benchmarking of Engineered Procurement Effectiveness Elements
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**Principal Authors of this Document from
Procurement Engineering, Engineering Practices, and Supply
Chain Quality EFCOG Subgroups/Task Teams**

Richard Salizzoni-Contractor Assurance and Quality Assurance Manager
Savannah River Remediation
EFCOG Supply Chain Quality Task Team Member

Spencer L Daw. – Procurement Engineer P.E.
Idaho National Laboratory
EFCOG Procurement Engineering Task Team Chair

Michael Fish – Procurement Engineering Manager PMP
Idaho National Laboratory
EFCOG Procurement Engineering Task Team Member

Daniel Baide, Deputy Chief Engineer
Washington River Protection Solutions
EFCOG Engineering Practices Subgroup Member

Joseph Fulghum, Supply Chain Quality Assurance Manager
Savannah River Nuclear Solutions
EFCOG Supply Chain Quality Task Team Vice Chair

William Wingfield, Quality & Performance Assurance Lead Auditor
Los Alamos National Laboratory
EFCOG Supply Chain Quality Task Team Chair

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1.0 Abstract

The document was developed to help improve engineered procurement effectiveness in the Department of Energy (DOE) complex. The document provides:

- a brief history of recently completed Energy Facility Contractors Group (EFCOG) engineered effectiveness initiatives
- examples of effective engineered procurement program elements that member sites may find useful in benchmarking for continuous improvement in their engineered procurement technical and quality delivery processes (see Attachment). These examples are considered effective practices and lessons learned and do not constitute requirements.

2.0 Purpose and Background.

The EFCOG board of managers initiated a task effort in late 2019 titled *Meet Mission Demands and Expectations with a Qualified Supplier Base*. The problem statement for the task effort indicated (summarized):

The current Department of Energy (DOE) (including but not limited to National Nuclear Security Administration (NNSA), Office of Science (OOS), Environmental Management (EM), and Nuclear Energy (NE)) supplier base lacks the required level of qualified private sector suppliers and the capacity to meet the DOE projected mission growth over the next 5 years and beyond. Additionally, DOE does not have an enterprise process for communicating multi-year needs, requirements, and acquisition plans by site, across a region or nationally, which inhibits the ability to attract new qualified suppliers or entice suppliers to perform work at multiple locations. Our current business models for contracting work with the private sector do not provide the envisioned value to DOE nor incentivize the private sector to bid on this type of work. Finally, DOE and its Prime contractors do not have consistent systems and process to standardize requirements and optimize the existing qualified supplier base or attract new qualified suppliers who would have interest in working at multiple sites.

To address this problem statement, EFCOG established a Supply Chain Initiative (SCI) team with diverse participation and leadership across the DOE complex to address seven core items relative to the problem statement. This overall effort status was summarized in the June 2020 EFCOG annual meeting with summary slides found at the following links:

https://efcog.org/wp-content/uploads/Library/Meeting%20Proceedings/2020%20Annual%20Meeting/EFCOG%20annual%20meeting%20slides_FINAL%20presentation%20for%20display.pptx

<https://efcog.org/wp-content/uploads/Library/Meeting%20Proceedings/2020%20Annual%20Meeting/EFCOG%20WG%20Chairs%20mtg%20MASTER%20slides%206-2-20%20FINAL.ppt>

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The supply chain initiative continues to be a strategic priority for EFCOG in 2021 as noted in https://efcog.org/wp-content/uploads/2021/01/2pg-EFCOG-Strategic-Priorities_10.19.20.pdf

One of the seven core initiatives was titled “*Quality/Safety Requirements*” with an overall focus to drive continuous improvement in engineered procurement effectiveness within the DOE complex. All sites perform some level of engineered procurements and effectiveness in this process can help reduce risks in safety or mission critical equipment delivery to meet DOE missions. A collaborative teaming of the EFCOG Procurement Engineering Task Team, Supply Chain Quality Task Team, and Engineering Practices Subgroup was formally established to lead engineered procurement effectiveness initiatives within EFCOG. This teaming was formalized in a charter approved by the respective teams found at

<https://efcog.org/wp-content/uploads/Wqs/Procurement%20Engineering/Engineered%20Procurement%20Charter-06-11-2020.pdf>

The collaborative teaming was established to be an enduring approach to continuous improvement with engineered procurements in the complex using the core EFCOG teams/subgroups that are major contributors to this activity. The charter also established a core team of representatives from each group to lead the collaborative efforts for engineered procurement effectiveness. This team makeup is also found at

<https://efcog.org/wp-content/uploads/Wqs/Procurement%20Engineering/EFCOG-engineered-procurement-core-team.pdf>

The first task performed by the collaborative teaming was to establish a new EFCOG Procurement Engineering (PE) Task Team Website

<https://efcog.org/procurement-engineering-task-group/>

that stored available EFCOG, DOE, or other relevant information relative to engineered procurement effectiveness. Through the recent history at EFCOG, numerous initiatives had developed guidance, tools, etc. to help with engineered procurement effectiveness, but their retrieval was difficult or most sites were unaware of the presence of the material. The task teaming identified relative, recent guidance on engineered effectiveness approaches and placed them on the new, more interactive PE Website as the central repository for resources for engineered effectiveness. The intent is this website will endure as the “Go To” point for relevant information and guidance and contacts on engineered procurement effectiveness, whether developed by the PE task group or other EFCOG subgroup or member sites.

3.0 Engineered Procurement Effectiveness Elements

The second task undertaken by the core team was to develop a list of best practices for engineered procurement programs that sites could consider implementing to help reduce risk in engineered procurement processes. The elements would address lessons in the full acquisition

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process from initial engineering, acquisition planning, specification development, vendor selection, specification execution, acceptance, etc. to ensure effective technical and quality delivery by the supply chain. The attachment to this report titled *Engineered Procurement Effectiveness Elements* includes this listing of elements that sites may consider evaluating to enhance their own programs. This “virtual” benchmarking approach of compiling best practices and reference materials from several sites is an efficient approach to share information particularly in periods where travel is limited such as during the COVID-19 Pandemic.

The practices in the attachment focus on more complex acquisitions such as design/fabricate a major safety related or missions critical process vessel or system versus purchase of an off-the-shelf commodity with simple receipt inspections for acceptance.

The elements in the attachment are based primarily on sites that utilize the following source documents:

- 10CFR830, Subpart A, Quality Assurance (QA) Requirements
- DOE Order 414.1D, Quality Assurance
- NQA-1, 2008-2009a, Quality Assurance Requirements for Nuclear Facility Applications
- DOE/RW-0333P, Quality Assurance Requirements and Description (Rev 20)
- NAP-24A or 401.1, Weapons Quality Policy

The attachment does not address “compliance” information for these source documents per se, but rather lists strategies employed to minimize risk in supply chain management from scope development to successful receipt. These practices have been developed considering lessons learned and program execution from a diverse set of sites/experiences in the complex. While geared towards programs aligned with the source documents above, the strategies would be beneficial to sites with other quality programs in place.

There is no intent by this report to advocate that all the information in the attachment is essential for all sites to implement. Many elements may not be necessary for effectiveness at a particular site based on the types, quantities, and maturity of engineered procurement acquisitions at their sites. The information is provided for information to aid those in benchmarking other site practices in areas they may determine would benefit their programs.

The attachment contains technical and quality procurement practices in seven topical areas:

- [People, Training, Organization, General Programs](#) (Attachment page 1)
- [Acquisition Planning and Scope of Work/Specification Development](#) (Attachment page 7)
- [Solicitation, Vendor Selection, and Award](#) (Attachment page 12)
- [Contract Execution and Vendor Oversight/Health](#) (Attachment page 17)
- [Receipt and Acceptance](#) (Attachment page 21)
- [Feedback and Supply Chain Health Approaches after Closeout](#) (Attachment page 22)
- [Engineering and Specialty Technical Guidance](#) (Attachment page 24)

For each effectiveness element, the following information is provided:

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- **Item Number** simple numerical number for reference purposes only. There is no implied order overall or in each topical area for this assigned number
- **Short Description of the effectiveness element**
- **Discussion** with more detailed explanation of the effectiveness element
- **Implementation References** that provides a site that implements that effectiveness element and references for that implementation that can be requested from the respective sites if desired to benchmark the topic. Contacts at the respective sites can be found on the respective EFCOG task team/subgroup contact lists on the EFCOG webpages to obtain the information from those sites. Some items are directly hyperlinked when they are available on the EFCOG or other external site network locations.

Note that while items are binned in one of the seven topical areas, but in many cases, they support other topical areas. The topical area that best fit the element is how they were binned. For example, Item number 1 associated with training programs in the People, Training, Organization, General Programs topical area benefits effectiveness in all topical areas. For this reason, individuals should review each section for potential benchmarking information that may be beneficial.

Example items discussed in the attachment that help reduce risk in developing and executing procurements include:

- Procurement training for specifications/scopes of work developers.
- Organizations should consider having a Procurement Quality Engineering/Supply Chain Quality organization separate from Facility/Construction Quality Engineers to review procurements and plan/perform vendor oversight strategies with engineering.
- Quality Engineers and Supply Chain QA Surveillance personnel have qualification standards defined for these positions.
- Templates and positive examples of effective specifications/scopes of work are readily available for personnel to utilize for future procurements for efficiency.
- Site procedures guide specification/scope of work developers to have meetings early in development with quality, other applicable subject matter experts, to gain input on acquisition approach and technical/quality approaches for the acquisition to improve specification quality, effectiveness, and timeliness.
- Effective use of the Master Supplier List for identifying potential suppliers and improve efficiency in vendor qualifications
- Procurement award procedures include the quality organization in such items as Best Value reviews for vendor selection.
- Key Engineering input needs prior to specification development.
- Oversight plans are incorporated into the specification/scopes and managed by a Supply Chain Quality organization or designated quality function.
- Templates for typical vendor oversight activities such as welding and non-destructive testing are utilized that incorporate lessons learned from past procurements.
- Guides are provided to vendors to develop quality verification document submittals and pre-fabrication/design briefings to ensure vendor understands procurement expectations.

These examples are further discussed in the attachment.

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The information in the attachment is focused on technical and quality elements of and acquisition and does not broadly address other Environmental Safety and Health (ESH) flow down or oversight approaches for on-site subcontractors relative to safety requirements, etc.

4.0 Conclusion

The information in this paper is intended to provide a point of reference to enable DOE sites to “virtually” benchmark other sites engineered procurement practices. Using the material provided, other sites can critically consider if any practices would benefit their programs to reduce risks in engineered procurement activities. Also, if a site believes they have other practices that would benefit the complex in sharing, they can contact the Procurement Engineering chair and suggest revisions to this document to include that additional information.

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| People, Training, Organization, General Programs | | | |
|---|--|--|---|
| Item Number | Short Description | Discussion | Implementation References |
| 1 | Implement training for Engineering Procurement Document Specifications (Spec)/Scope of Work (SOW) preparers and Cognizant Quality Assurance reviewers. | Specific training should be provided to engineering and quality assurance personnel involved with specification/scope of work development. This training should provide expectations for technical and quality attribute flow down from properly approved/developed design to enable effective specification/scope of work development. Training should stress engineering ownership in defining necessary technical requirements, deliverables, quality program flow down, surveillances, quality records to be submitted, etc. are suitable for the safety/mission critical procurement. | <p>Savannah River Site (SRS) Training Program Descriptions (PROGQATP-PDES-0001-02 for Quality and LWOTS000 for Engineering). Training program course is ETS20034, Procurement Practices, and QQPR1130, Procurement Document Review.</p> <p>Hanford Tank Farms has used a vendor provided training course (now discontinued) for developing/writing comprehensive Statements of Work (SOW) for new engineering staff or as refresher training.</p> |
| 2 | Effective Organization structures for Engineered Procurement Activities | Organizations should be organized to efficiently facilitate the procurement process. This is usually done through functional organizations or a direct matrix organization. | <p>Examples of a functional organization where quality, engineering, procurement, and other organizations are separate with procedurally defined roles for each organization can be found by contacting at Savannah River site personnel.</p> <p>Examples of a matrix organization where engineering, quality, procurement, and other organizations are matrixed to one organization for procurement activities can be found by contacting Idaho National Lab (INL).</p> <p>The EFCOG Procurement Engineering (PE) website contains a list of primary contact names for the subgroup and how to request contact information for individuals at other sites. The link to the PE website is:</p> <p>https://efcog.org/procurement-engineering-task-group/</p> |
| 3 | Managers should assign suitably qualified and experienced personnel (SQEP) to develop specifications or SOWs. | This direction is meant to recognize some procurement scopes require more experienced individuals to properly execute an effective acquisition. Even a trained individual may not have sufficient experience and background to develop acquisition strategies and | No procedural requirement required but can be required to re-enforce expectation given numerous instances where sites have shared impacts around specifications being developed by individuals that were not SQEP. In all cases, the manager assigning the task to the individual is responsible they are suitably experienced to develop the technical and quality |

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| People, Training, Organization, General Programs | | | |
|---|---|---|---|
| Item Number | Short Description | Discussion | Implementation References |
| | | technical/quality requirement flow down for complex procurement scope of work development and execution. | resources with the appropriate subject matter experts available for input/review as required. |
| 4 | Supply Chain Management Council (SCMC) is established to ensure procurement lessons learned and process improvements occur at each site. | Establishing a SCMC (or alternate team name) collaborative team with Engineering, Quality, and Procurement to jointly address procurement best practices, lessons learned, issues, concerns, and problem areas to monitor and improve procurement process issues at each site is a beneficial tool. | Savannah River Remediation (SRR) Supply Chain Management Council Charter and Savannah River Nuclear Solutions Supply Chain Center of Excellence Charter. |
| 5 | Quality Assurance should consider establishing a dedicated Supply Chain Quality group (or at least personnel designated) to plan and executing engineering procurement activities such as developing oversight strategies with engineering. | <p>A designated core group of Quality Assurance personnel assigned to effectively execute procurement development, vendor selection, and vendor oversight is beneficial. This focused group of supply chain quality professions can help ensure effectiveness across the spectrum of engineered procurements performed by a particular site. Example activities this group of individuals can perform includes reviewing key safety related and mission critical procurements/scopes of work to ensure the procurement has adequate quality approach considering technical quality, and vendor oversight strategies defined in the procurement. This group also performs the oversight of activities (as directed by engineering, project team, etc.) at the vendor shops pre and post award (e.g., via qualified auditors to perform pre-award audits, qualified Source Surveillance Representatives in welding, non-destructive testing activities, etc.).</p> <p>This function is independent of the Cognitive Quality Function (Facility/Construction Quality Engineers) reviewing of the SOW/specification to incorporate supply</p> | Savannah River Nuclear Solutions (SRNS), Savannah River Remediation, Idaho National Lab (INL), Los Alamos National Laboratory (LANL), and Hanford Tank Operations Contractor (TOC) have implemented these approaches. |

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| | | <p>chain management lessons learned, sound oversight strategies, etc.</p> <p>This separate group is considered an effective element an overall effective supply chain management approach.</p> | |
| 6 | Qualification cards for supplier surveillance personnel | <p>Personnel performing supplier oversight should have specific training and qualification programs to support their oversight roles (e.g., qualifications to perform weld program oversight, Non-destructive testing oversight, auditor/lead auditor, etc.) including skills to develop oversight strategies. Note that auditing qualifications are typically not required to perform post award source surveillance activities.</p> | <p>Savannah River Site has implemented source surveillance program qualification programs, see SRS M&O and LW Quality Assurance Personnel Core Training PROGQATP-PDES-0001-02</p> <p>Hanford Tank Farms personnel performing supplier surveillance and surveys must complete web-based training (Course #350322 – “ASSESSMENT TECHNIQUES”) and the appropriate functional organization qualification card (Course #351886 – “QA COMMERCIAL GRADE DEDICATION SPECIALIST” or #350257 – “PROCUREMENT ENGINEERING SPECIALIST”).</p> <p>From INL, MCP-13730, “PERFORMING ASSESSMENTS AND ASSURANCE ACTIVITIES” includes the following:</p> <p>For Independent Assessments, Management Assessments, Quality Assurance Audits, and Surveillances assign a qualified lead assessor (QNLASSOR – Lead Assessor qualification code) or equivalent.</p> <p>Assign a qualified assessor (QN0ASSOR: INL Assessor) or as needed, assign additional technical specialists for each objective.</p> <p>From MCP-4252, “INL Quality Assurance Oversight” Quality Assurance (QA) audits shall be led by a QA Lead Auditor who has an approved Form 220.35, “Battelle Energy</p> |

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| Item Number | Short Description | Discussion | Implementation References |
| | | | <p>Alliance Record of Quality Assurance Lead Auditor Qualification,” (Qualification Code QNLAUDQA) documented in TRAIN prior to performing the audit.</p> <p>Auditors who participate in QA Audits shall have an approved Form 220.34, “Battelle Energy Alliance Record of Quality Assurance Auditor Qualification,” (Qualification Code QNAAUDQA) documented in TRAIN prior to performing the audit.</p> <p>Technical Specialists who participate in QA Audits (Qualification Code QNTECHSP) shall have an approved Form 220.36, “Battelle Energy Alliance Record of Technical Specialist Qualification,” documented in TRAIN prior to performing the audit.</p> <p>LANL’s Lead Auditors and Auditors are qualified and certified per LANL P330-3 Quality Audits.</p> |
| 7 | <p>Engineering personnel designated as site recognized expert(s) in developing effective specifications/scopes of work should review and approve mission critical safety related/non-safety related specifications/scopes of work for adequacy prior to issuance to supply chain.</p> | <p>Selected subject matter experts (SME) with extensive procurement specification and SOW development experience (Procurement Specification Authorities) are designated to independently review and approve selected safety related or complex non-safety procurement documentation. This SME review helps ensure technical and quality adequacy of the specification/SOW and ensure executable specification by the supplier.</p> <p>This approach can be adopted in any organization but would particularly benefit organizations where there is limited experience in engineered procurements by broad groups or where an organization recognizes inconsistent</p> | <p>Savannah River Site has implemented this approach via use of the Procurement Specification Authority defined in site Manual 3E, Procurement Specification Manual.</p> <p>LANL maintains a list of Technical SMEs/Quality SMEs authorized to sign purchasing documents, per P-840-1 <i>Quality Assurance for Procurements</i></p> |

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| | | effectiveness in specification/scope of work development for mission critical or safety related procurements. | |
| 8 | Guidance developed for Quality Engineers on procurement quality strategies, particularly for large project acquisitions. | An EFCOG best practice was recently issued on important items every quality engineer should know when involved with procurements in larger projects, particularly those managed under DOE Order 413.3 Project Management. This lessons-learned document is titled, Quality Assurance Considerations for Supply Chain Management in Large-Scale Capital Asset Acquisition Projects. The information in this document is geared toward larger acquisitions but can be applied to other procurements as well. | See EFCOG Best Practice website, Best Practice 225 at Best Practices – EFCOG.org |
| 9 | Procurement use of a "Graded Approach" for controlling procurement actions commensurate with the functional quality and technical requirements associated with the intended use or application of the procured item or service. | The overall risk of the procurement activity is considered when determining the level of control to be placed on the procurement. The Graded Approach consists of multiple defined levels of control. Levels of control for purchased items and services incorporate minimum requirements for each level. Highest level of control should satisfy the most rigorous quality requirements and visa/versa. This review considers such items as safety function, complexity, mission importance, etc. in deciding procurement or quality level. | <p>The graded approach for procurement actions is described in Savannah River Site quality procedure 1Q 7-2 Control of Purchased Items and Service and Engineering procedure, E7 3.10, Determination of Quality Requirements for Procured Items.</p> <p>Hanford Tank Farms procedure for Graded Quality Assurance (TFC-ESHQ-Q-ADM-C-01) is used for procurement of items and services.</p> <p>Hanford Tanks Farms procedure for Enterprise Risk and Opportunity Management (TFC-PRJ-PC-C-13) is used to manage and control procurement risks at the Program or Project levels.</p> <p>Grading at INL occurs via the following Lab-Wide Procedure: - LWP-13014, "<i>Determining Quality Levels</i>"</p> |

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| | | | - LANL uses a graded approach as described in SD330, <i>Los Alamos National Laboratory Quality Assurance Program</i> . |

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| Acquisition Planning and Scope of Work/Specification Development (Procurement Strategy Development, Procurement Specification/Scope of Work Development) | | | |
|---|---|--|--|
| Item Number | Short Description | Discussion | Implementation References |
| 10 | Procedures, established guides, or practices include periodic (e.g., 15% and 80% complete) meetings with key stakeholders to ensure proper technical and quality requirements are being included in specifications/SOWs for an effective procurement. | <p>Site procurement procedures or guides should recommend that personnel assigned to develop specification/scopes for safety related/mission critical complex engineered procurements have periodic (e.g., early 15% and mid 80)s specification completion meetings with key approval groups (e.g., quality, procurement, engineering) to ensure proper acquisition approaches and flow down is being put into the specification/scopes of work as early in the development as possible.</p> <p>Checklists to facilitate these reviews can help ensure a suitable acquisition approach and specification/scope of work is developed. This approach can help prevent specification/scope of work rework during approval process, improve consistency, and help ensure effective supply chain performance.</p> | <p>Savannah River Site 3E Procurement Specification Manual includes this guidance at Savannah River Site.</p> <p>Hanford Tank Farms procedure for Acquisition Planning (TFC-BSM-CP_CPR-C-11) outlines communications between the Programs/Projects and the Procurement Department to finalize plans & schedules for the execution of actions to issue Subcontracts and Purchase Orders that support project schedules.</p> |
| 11 | Templates for SOW/SPEC's | Sites should have detailed templates for Specification and Scope of Work Content including standardizing key typical content clauses for consistency in acquisitions at that site. | <p>Savannah River Site 3E, Procurement Specification Manual</p> <p>Hanford Tank Farms procedure for Acquisition Planning (TFC-BSM-CP_CPR-C-11) lists SOW Template descriptions and when each is used. All templates are consolidated at one location on the Buyer's Technical Representative webpage. SOW templates supporting the procurement of engineered items include:</p> <ul style="list-style-type: none"> • Template C-1, "Other Hanford Contractors - Technical" • Template C-2, "General Contractors -Technical" • Template C-3, "National Laboratory – Technical" • Template E, "Design/Fabrication" |

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|---|--|---|---|
| Item Number | Short Description | Discussion | Implementation References |
| | | | <p>Hanford Tank Farms uses a common set of Quality Clauses (B Clauses) that are consistent across all Hanford Site contractors.</p> <p>Idaho National Laboratories employs the following templates for SOW's and Specification: TEM-10101-1, "<i>General Specification Template</i>" TEM-10101-2, "<i>General Construction Specification Template</i>" TEM-10400-4, "<i>Template for Statement of Work</i>"</p> |
| 12 | Procurement, Engineering and Quality personnel are involved with acquisition strategy as initial discussion to begin specification/SOW development | Procurement, engineering, and quality should work early in specification development to develop the best acquisition strategy for the scope of work such as full technical scope of work or specification, NQA-1 flow down, commercial grade dedication options, engineering design and vendor build or vendor perform entire scope, etc. Early discussions on strategy will help ensure adequate specification/SOW development. | <p>Savannah River Site 3E Procurement Specification Manual and 7B/S18 Procurement Practices Manuals.</p> <p>Hanford Tank Farms procedure for Commercial Grade Dedication (TFC-ENG-DESIGN-C-15) discusses having procurement strategy meetings, consistent with guidance found in DOE handbook on CGD (DOE-HDBK-1230-2019).</p> <p>Procurement Engineering at INL is the gatekeeper for procurements. Due to this organizational structure, Procurement Engineers can develop appropriate procurement strategy with the requesting engineering organization.</p> |
| 13 | Best example SOW/SPEC's available as tools for new procurements | Procurement related website pages should include site recognized exemplar SOWs/specifications for others to use as templates/input to develop similar acquisitions. These best examples, agreed to by QA and Engineering, provide an efficiency and quality improvement for specification/scope of work development. This would be particularly helpful if there are many personnel that develop specifications/SOWs at a site and/or are less experienced in engineering procurements. | At Savannah River Site, example specifications include safety related evaporator vessel fabrication specification, Salt Disposal Unit construction specification (both at SRR) as well as several variations of safety related glove box fabrication specifications with SRNS. Evaporator example included project specific QA plans as well to support the overall critical procurement. Specifications for other engineered items available upon request as well. |

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| Item Number | Short Description | Discussion | Implementation References |
| | | | <p>Examples of Hanford Tank Farms SOWs and specifications for engineered procurements which meet technical rigor & quality standards include:</p> <ul style="list-style-type: none"> • Requisition #333413 (SOW), "AW-02E Pump and Jumper Replacement Project Equipment Fabrication" • RPP-SPEC-60226, Rev 01, "Procurement Specification for Double-Shell Tank Waste Transfer Pumps" • Requisition #348462 (SOW), "Alternate Slurry Pump Development and Qualification" • RPP-SPEC-60187 Rev 03, "Procurement Specification for Submersible Slurry Pump for 241-A/AX Tank Farm Retrieval Project" • RPP-SPEC-47739, Rev 08, "Specification for an Extended Reach Sluicing System (ERSS) for 241-C and 241-AX" <p>At INL, SPC-2372 specifies the requirements for construction of the Sample Preparation Laboratory. Included in this specification are sections 03 3021 (Structural) and 05 5021 (Mechanical) that incorporate commercial grade dedication requirements for Safety Significant portions of the design.</p> |
| 14 | Surveillance personnel review specifications during approval process | Procurement procedure manuals should require Cognizant Quality Function and Quality Source Surveillance review of specifications and scopes of work prior to approval. This will ensure quality assurance source surveillance experienced personnel designated to interface with the supply chain for qualification, surveillances, etc. have input to the specification development to help ensure procurement effectiveness. | <p>Savannah River Site 3E Procurement Specification Manual Procedure 1.2</p> <p>Hanford Tank Farms requires approvers for all Material Requests and on SOWs.</p> <p>Idaho National Lab has implemented this inherent to organizational roles for quality group review of engineered specifications/scopes of work since not separate groups.</p> |

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| | | | Creation of SOW's and Procurement Specifications is an engineering activity. As Procurement Engineering is embedded within the Engineering Organization, PE can assist in the development process or originate the SOW / Specifications. |
| 15 | An "Expression of Interest" may be issued to potential bidders to determine their interests and qualifications. | An Expression of Interest (EOI) issued to potential bidders to determine their interest and qualifications include a description of the work/service (scope of work), along with a draft of the technical specifications outlining the technical and quality requirements of the work/service. The Scope of Work included in the EOI should be first reviewed by the Cognizant Technical Function (CTF) and quality function. | Savannah River Site procurement procedures (3E Manual) provide steps to ensure quality and engineering participate in engineered procurement selection and award processes. Same for Hanford Tank Farms and INL. |
| 16 | Supplier Qualification Streamline Strategies | The Supplier Quality Management System (QMS) evaluation/qualification process may take a lengthy period (i.e., 3-6 months). This amount of time (i.e., delay uncertainty) may adversely impact project schedules. To mitigate this uncertainty and potential delay, one might consider the following streamline preparation supplier qualification strategies. <ol style="list-style-type: none"> 1. Qualify enough suppliers prior to the bid process. The project should have an idea of the long lead items and a good idea of potential suppliers. <ul style="list-style-type: none"> - The advantage of this strategy is to build a sufficient supply base to realize competitive bids with the advantage of placing procurement contacts with qualified suppliers. The qualified suppliers can begin work immediately and without delay. - The disadvantage to this strategy is that some qualified suppliers may not be awarded | SRNS has implemented the strategies noted to prepare for increased facility design/build and equipment design/fabrication scopes to support a new facility construction for National Nuclear Security Administration missions at the Savannah River Site. The EFCOG Joint Supplier Evaluation Program (JSEP) Supplier Evaluation Governing Document (E-SG-QA-SCQ-2020-01, created by the EFCOG Supply Chain Quality Task Team provides guidance on performing supplier audits as well as 3 rd party evaluations. This document is available at: https://efcog.org/safety/quality-assurance-subgroup/supply-chain-quality-task-group/?drawer=Supply%20Chain%20Quality*Documents |

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| Acquisition Planning and Scope of Work/Specification Development (Procurement Strategy Development, Procurement Specification/Scope of Work Development) | | | |
|---|--------------------------|--|----------------------------------|
| Item Number | Short Description | Discussion | Implementation References |
| | | <p>a procurement contact and yet the project incurred the cost of performing the audit.</p> <p>2. Establish an intermediate list of suppliers that have a high confidence of passing an evaluation/qualification. Leverage EFCOG Master Supplier List (MSL), Nuclear Industry Assessment Committee (NIAC), etc.,</p> <ul style="list-style-type: none"> - The advantage would be to extend the supply base to realize competitive bids. Minimize risk of delay because of the high confidence suppliers. - The disadvantage would be that the project would realize a short delay due to the performance of the audit. <p>3. Combination of strategy 1 and strategy 2.</p> | |

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Engineered Procurement Effectiveness Elements

Solicitation, Vendor Selection, and Award (Acquisition Activities and Pre-qualification, Contract Award)

| Item Number | Short Description | Discussion | Implementation References |
|-------------|---|---|--|
| 17 | Key sub tier suppliers are reviewed as part of award when needed. | Contract "Terms and Conditions" contain language granting right of access and review of sub tier suppliers. Proposals also are required to include key subcontractors for potential evaluation. | <p>Savannah River Site Contract "Terms and Conditions" contain language granting right of access and review of sub tier suppliers. In some critical procurements, auditing or oversight prior to/after award are considered and implemented. Examples at Savannah River of this execution to review sub tiers included Salt Disposal Unit contracts and Tank Closure Cesium Removal Projects (see quality plans G-PSQ-Z-00001, Salt Disposal Unit-6 QA Plan and G-PSQ-H-00004, Tank Closure Cesium Removal QA Project Plan.</p> <p>Example at Idaho included SPL Sample Prep Lab acquisition in particular sub tier contractor performing safety related activities.</p> <p>Sandia National Labs (SNL) utilizes a Supplier Risk Management program to review suppliers and their sub-tier suppliers.</p> |
| 18 | Vendor selection processes should include contacting other sites for history of performance to consider in down-select activities and oversight approaches post award | <p>Vendor performance should also be considered when selecting suppliers. Performance should be based on measurable factors to include:</p> <ol style="list-style-type: none"> 1. Measurable drift in QA Program Implementation 2. On time delivery percentage 3. Rejection / Rework verses Acceptance rate during fabrication | <p>Savannah River Site Q19, Procedure 102 and 102A describes supplier performance measures. Collaboration between Receiving Inspection, Supplier QA, and Procurement support the creation of a Supplier Report Card that establishes a performance score of six-month average. Procurement and Supplier QA hold monthly meeting with suppliers to discuss their performance.</p> <p>Supply Chain Management Center of Excellence is the collaborative body that oversees this process.</p> |

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| Solicitation, Vendor Selection, and Award (Acquisition Activities and Pre-qualification, Contract Award) | | | |
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| Item Number | Short Description | Discussion | Implementation References |
| | | <p>4. Rejection / Rework verses Acceptance Receiving Inspection</p> | <p>Individual sites may use the MSL information to contact other locations that have used that supplier for verbal input on performance experience (depending upon business sensitive considerations). This history can lead to more effective risk informed acquisition planning and oversight strategies to be employed.</p> <p>MSL use has previously been recommended for all EM sites per EFCOG Final Report – EM SINGLE APPROVED SUPPLIER LIST PROCESS TASK TEAM in September 2017. This document is available on the Procurement Engineering Website at Procurement Engineering Task Team – EFCOG.org</p> <p>The EFCOG Joint Supplier Evaluation Program (JSEP) Supplier Evaluation Governing Document (E-SG-QA-SCQ-2020-01, created by the EFCOG Supply Chain Quality Task Team provides guidance on performing supplier audits as well as 3rd party evaluations.</p> <p>This document is available at: https://efcog.org/safety/quality-assurance-subgroup/supply-chain-quality-task-group/?drawer=Supply%20Chain%20Quality*Documents</p> |

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Solicitation, Vendor Selection, and Award (Acquisition Activities and Pre-qualification, Contract Award)

| Item Number | Short Description | Discussion | Implementation References |
|-------------|--|---|--|
| 19 | Vendor selection processes clearly include technical and quality capability evaluation criteria to select vendors and vendor selection evaluation team includes quality representative | Vendor selection processes should include team of engineering and quality personnel to evaluate vendor submittals for vendor selection. | <p>Savannah River Site procurement procedures (e.g., S18 Procedure 2.10, Solicitation and Evaluation Process and 2.19, Best Value Source Selection) provide steps to ensure quality and engineering participate in engineered procurement selection and award processes.</p> <p>Hanford Tank Farms Procurement Department procedures also require a technical evaluation to be completed and signed by Engineering and Quality Assurance during the selection and award process when applicable.</p> |
| 20 | Evaluation processes differentiate best value, low cost technical acceptable, etc. Cost information is reviewed last in the selection process to more effectively evaluate technical and quality submittals. | Site procedures should clearly articulate this expectation or alternate approaches. | <p>Savannah River Site procurement procedures provide steps to ensure quality and engineering participate in engineered procurement selection and award processes. Implementing procedures include S18 Procedure 2.10, Solicitation and Evaluation Process and 2.19, Best Value Source Selection.</p> <p>Hanford Tank Farms Procurement Department removes pricing when proposals are sent to the technical evaluation team to ensure proposals are judged solely on technical aspects/merits.</p> <p>The INL procedure for proposal evaluation is LWP-4001, "Acquisition of Materials and Services". Methodology for selecting and evaluating proposal packages is based on experience and the "Procurement Program Description".</p> |
| 21 | Best value selection weighting factors include engineering | Site procedures should clearly articulate this expectation or alternate approaches. | Savannah River Site procurement procedures provide steps to ensure quality and engineering participate in engineered procurement selection and award processes. |

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| Solicitation, Vendor Selection, and Award (Acquisition Activities and Pre-qualification, Contract Award) | | | |
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| | and quality personnel input prior to issuing requisition. | | Same for Hanford Tank Farms. |
| 22 | Use of DOE Master Supplier List provides efficiency in potential bidder identification and in pre-award vendor qualification. | <p>The Master Supplier List (MSL) (formerly known as Master Approved Supplier List (MASL) is the single DOE database used by contractors to share supplier evaluation/qualification information. Numerous EFCOG efforts have shared the benefits of this database including EFCOG Final Report, EM SINGLE APPROVED SUPPLIER LIST PROCESS TASK TEAM. This report issued in 2017 recommended all DOE-EM sites start using this database.</p> <p>There are two key uses of MSL to be more efficient in engineered procurements:</p> <ol style="list-style-type: none"> 1. The list of qualified vendors can be searched to ensure suitably qualified vendors are included in solicitation processes 2. MSL supplier qualification information resources (e.g., pre-award audits by other sites) can be used to qualify a vendor more efficiently prior to use by other sites. | <ul style="list-style-type: none"> • https://msl.kcnsc.doe.gov/ • EFCOG Final Report – EM SINGLE APPROVED SUPPLIER LIST PROCESS TASK TEAM • EFCOG Supply Chain QA Subgroup helps facilitate MSL use and continuous improvement. <p>The EFCOG Joint Supplier Evaluation Program (JSEP) Supplier Evaluation Governing Document (E-SG-QA-SCQ-2020-01, created by the EFCOG Supply Chain Quality Task Team provides guidance on performing supplier audits as well as 3rd party evaluations.</p> <p>This document is available at: https://efcog.org/safety/quality-assurance-subgroup/supply-chain-quality-task-group/?drawer=Supply%20Chain%20Quality*Documents</p> |
| 23 | Preplanning of on-site supplier audits should include getting as much completed as possible remotely prior to the on-site audit. | <p>It's important that the lead auditor perform adequate pre-planning prior to performing an on-site audit. This should include:</p> <ul style="list-style-type: none"> • Pre-filling out the appropriate (e.g., NQA-1, or NAP-401.1) checklist with the information from the suppliers Quality Management System. <p>Include adding into the checklist the previous audit findings, or Opportunities for Improvement.</p> | <p>Refer to Master Supplier List (MSL) also for other sites EFCOG Supply Chain working group references on vendor audits.</p> <p>The EFCOG Supply Chain Quality Working Group (SCQWG) holds monthly Web-ex (Currently the 3rd Wed of each month at 11:00am EST). Supplier audit schedule and issues are discussed at that time.</p> |

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| Solicitation, Vendor Selection, and Award (Acquisition Activities and Pre-qualification, Contract Award) | | | |
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| | | | Contact Bill Wingfield at wwingfield@lanl.gov if you want to be on distribution for the notifications. |
| 24 | Complex Specifications/SOW's should include a deliverable requirement for vendor to submit a Design Requirements Compliance Matrix to ensure specification implementation adequacy. | A Design Requirements Compliance Matrix (DRCM) is meant to have the vendor demonstrate compliance with the requirements of the specification/SOW particularly for engineering design, fabrication, and testing. Sites should consider this deliverable to be a required submittal to help ensure the vendor fully meets specification requirements. The deliverable should be required to be initiated early in the performance of the contract with in-progress submittals required (e.g., initial 25% and 60% of scope completion to ensure the matrix and scope execution adequacy. This deliverable can be particularly helpful in reducing risk in the acquisition of complex items. | Both Savannah River Site and Hanford Tank Farms have implemented this type of deliverable in selected procurements. At Savannah River, site procurement manual 3E includes general guidance for including this type of deliverable. At Hanford, this is including in procedure TFC-ENG-DESIGN-C-42. Both sites can provide examples of the deliverable being required and example deliverables accepted. |

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| Contract Execution and Vendor Oversight/Health (Contract Award and Initial Execution, Monitor Vendor Performance and Health) | | | |
|---|---|--|--|
| Item Number | Short Description | Discussion | Implementation References |
| 25 | Kickoff meeting prefab or pre-service to set disciplined contract technical and quality requirement expectations with the supplier. | A Supplier Pre-Design / Pre-Fabrication Briefing Guide that provides information to be discussed with the supplier prior to beginning design/fabrication activities. A structure discussion on requirements, exception processing, quality record development, surveillance plans and hold/witness points, etc. can provide increased benefit of effective contract execution. Face to face or video conference preferred. | Savannah River Remediation has an issued guide titled Supplier Pre-Design/Prefab Briefing Guide, to facilitate these discussions. Hanford Tank Farms holds kickoff meetings with suppliers prior to beginning work. |
| 26 | Standardized surveillance Checklists templates for welding, NDE, etc. | Standardized checklists for such items as the following procurement related surveillance activities can ensure consistency in reviewing vendor performance and can help incorporation of lessons learned for continuous improvement of ongoing surveillance. Weld inspection checklists include not only Nondestructive Testing inspection elements but welding process control verifications (e.g., essential variable control checks) to ensure welding adequacy. <ul style="list-style-type: none"> • AG-1 & AWS D9.1 HVAC-Sheet Metal • ASME VIII, Div 1 Welding Inspection • AWS D1.1 Welding Inspection • AWS D1.6 Welding Inspection • B31.3 Welding Inspection • Dye Penetrant Testing • Eddy Current Surveillance Guideline • Electrical Guideline • Helium Mass Spec Tracer Probe Form • Visible Mag Particle Testing • RT Film Checklist | Savannah River Site has developed example checklists that can be utilized. |
| 27 | Oversight strategies developed and include | Oversight is required to be implemented per site quality procedures for Control of Purchased Items and Services. To implement this, Engineering and QA may develop several | Savannah River Site procedures indicate QA/QC plans per procedure 1Q Manual, QAP 4, Procurement Document Control and QAP 7, Control of Purchased Items and Service, 3E |

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| Contract Execution and Vendor Oversight/Health (Contract Award and Initial Execution, Monitor Vendor Performance and Health) | | | |
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| | looking at sub tier suppliers as necessary | different products depending upon the significance/complexity of the procurement. Tools used include procurement or project specific quality plans, source surveillance plans, and vendor health monitoring practices. Oversight strategies are considered for programmatic as well as fabrication/installation details. Oversight strategies should monitor execution early and throughout the contract execution to identify issues as early as possible and ensure effective performance throughout the contract execution for complex/important engineered acquisitions. | <p>Procurement Specification Manual, Source Surveillance Plans per procedure Q19, Site QA/QC Services 100 Series procedures, and examples of products such as those for a replacement Evaporator fabrication (safety related, mission critical vessel, high cost).</p> <p>Hanford Tank Farms uses QA Surveillance reporting (TFC-ESHQ-Q_PP-P-02) to evaluate the quality of supplier work.</p> <p>The Sample Preparation Laboratory construction project is an example where INL has employed an acceptance plan that included direct tests and inspections, source verification and surveys. The primary procedure used is LWP-10109, <i>“Commercial Grade Dedication”</i>.</p> |
| 28 | Guidance provided to vendors to effectively develop record submittal packages (Quality Verification Document Requirement - Preparation Guide) | <p>This document provides guidance to suppliers preparing and submitting Quality Verification Document Requirement (QVDR) packages to demonstrate compliance with the completed activity, fabrication, etc. The QDVR is a quality record for components and services and is a representation of the suppliers’ dedication to quality services and attention to PO requirements. Through understanding and use of the guide in parallel with compliance to contract requirements, suppliers and sub-suppliers significantly improve likelihood that acceptable QVDR documents will be delivered on time, the first time.</p> <p>Other tools such as witness / hold point, 30/60/90 percent design review, and document review as the procurement progresses are an effective means of ensuring compliance and quality when the product is delivered.</p> | <p>Savannah River Remediation has developed an example of this quality record submittal guide which is provided to suppliers as part of award and discussed in pre-design/pre-fabrication meetings.</p> <p>Hanford Tank Farms uses a Master Submittal Register and Vendor Submittal Distribution Matrix submittal process (TFC BSM IRM_DC-C-07).</p> <p>INL has employed Pro-Core to aid in review and approval of submittals. Pro-Core is a “front-end” system to handle the volume of submittals expected with SPL. Those submittals will be transferred in our Vendor Data Submittal system which is governed by the following procedures:</p> |

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| Contract Execution and Vendor Oversight/Health (Contract Award and Initial Execution, Monitor Vendor Performance and Health) | | | |
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| Item Number | Short Description | Discussion | Implementation References |
| | | | <p>MCP-3573, "VENDOR DATA PROCESS"</p> <p>LWP-7203, "VENDOR DATA PROCESS"</p> <p>The above noted procedures describe the INL Vendor Data Submittal (VDS) process to identify documents for review as the procurement progresses. Procurement specifications contain required witness and hold points.</p> |
| 29 | Vendor Health Monitoring Tools | A process to visually demonstrate vendor performance health on key elements of an ongoing task activity. Such elements as welding, NDE, etc. would be monitored and graded routinely to demonstrate effectiveness of the vendor. | <p>This practice is being employed at Savannah River Remediation on vendors performing engineered item fabrications with source surveillance plans. This tool has enabled improved monitoring and demonstration of vendor health during contract execution. This performance health information is also used as input to quarterly vendor performance processes described in line item 32.</p> |
| 30 | Remote Source Verification , Auditing, and Surveillance | EPRI 3002019436 issued 4/30/20 provides screening criteria and guidance on performing Remote Source Verifications or eSource Verification during a Pandemic of similar state of emergency. | <p>EPRI3002019436, "Remote Source Verification During a Pandemic or Similar State of Emergency: Screening Criteria and Process Guidance," for performing remote source verification. issued 4/30/20 provided screening criteria and process guidance. This technical report was endorsed by the Nuclear Regulatory Commission for use (Docket No 50-397 Memo Chawla to Sawatzke at https://www.nrc.gov/docs/ML2017/ML20170A613.pdf)</p> <p>INPO issued guidance on performing Source Verifications Remotely (CGD Method 2)</p> |

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**Contract Execution and Vendor Oversight/Health (Contract Award and Initial Execution,
Monitor Vendor Performance and Health)**

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| | | | <p>LANL has issued the procedure for performing Remote Audits: IQPA-ASO-GU-001 Remote Assessments and Audits Guide.</p> <p>International Accreditation Forum (IAF) issued IAF MD 4:2018, Issued 7/4/18 IAF Mandatory Document for the Use of Information and Communication Technology (ICT) for Auditing/Assessment Purposes, located at</p> <p>https://www.iaf.nu/upFiles/IAF%20MD4%20Issue%202%2003072018.pdf</p> <p>Caution: If you perform a Remote Audit your Report needs to state this.</p> |

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| Receipt and Acceptance | | | |
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| Item Number | Short Description | Discussion | Implementation References |
| 31 | Receipt Inspection for Engineered Procurements should not have to verify fabrication or record acceptability at receipt. RI should be for shipping damage checks and basic receipt. | The goal for Receipt Inspection of engineered fabrications should be to have no elements to check acceptability of the fabrication. If a fabrication element is critical to verify, it should be checked by source inspection prior to releasing the item to be shipped to the site. Inspecting fabrication aspects or quality record submittal adequacy upon receipt is typically an unacceptable risk for timely acceptance of the item for something that may require the item to be shipped back to the fabricator for rework/repair. Acquisition strategies that perform fabrication inspections at receipt should be limited due to the risk of issues being identified. Oversight during fabrication at the vendor facilities should ensure all deliverables and equipment meets requirements PRIOR to shipment and receipt should be limited to verifying no damage occurred, all parts are received, etc. | This strategy is employed at the Savannah River Site for major acquisitions as part of Supply Chain QA personnel involvement in the specification approval, source surveillance planning, and RI planning prior to releasing the specification/SOW for request for proposal but is not explicitly a procedural requirement. |

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| Feedback and Supply Chain Health Approaches after Closeout | | | |
|---|---|---|--|
| Item Number | Short Description | Discussion | Implementation References |
| 32 | Supplier performance evaluations are performed and documented in a Quality Assurance Supplier Performance (QASP) Report to help drive vendor performance and provide input into vendor selection processes. | A Quality Assurance Supplier Performance (QASP) process should evaluate supplier performance on a quarterly basis and is a resource for Supply Chain Management and Procurement Quality Engineers to utilized in the bid process in determining the level of surveillance oversight for current and future procurements. The QASP information evaluates supplier quality performance data for mission critical activities requiring receipt inspection activities. A "Request for Supplier Corrective Action" (OSR 28-148) is considered when QASP indicates the supplier performance is below an acceptable level. | <p>This process is described in procedure Savannah River Site 1Q 7-2 "Control of Purchased Items and Services" section 5.14 Supplier Corrective Action. The process is further described in Savannah River Site procedure Q19 102 "Supplier Performance and Corrective Action". Example reports available from Savannah River Nuclear Solutions and Savannah River Remediation including vendor performance feedback forms.</p> <p>The Hanford Tank Operations Contract (TOC) currently utilizes Supplier Corrective Action Reports (SCARs) to support the Supplier Performance Management program. The SCARs deal with specific supplier issues on a case-by-case basis only and are covered in procedure TFC-ESHQ-Q_C-C-05.</p> <p>Additionally, the Hanford TOC has deployed a fully automated system for evaluating subcontractor performance using the scale from "Unacceptable" to "Exceptional" to grade suppliers in areas covering:</p> <ul style="list-style-type: none"> • Quality of Work – Technical Performance; Complied with Scope; Used Appropriate Levels of Expertise; Met Reporting Requirements; and Deliverable Required a Minimum of Re-Work • ESH&Q Performance – Safety program compliance; Accident & Injury Performance; Safety Issue Responsiveness; QA Program Compliance; and Environmental Program Compliance • Schedule – Met Milestones; Completed Work on Time; and Provided Timely Data • Cost/Price – General Cost Efficiency; Provided Notification of Overruns; and Reasonable Use of Other Direct Costs |

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| Feedback and Supply Chain Health Approaches after Closeout | | | |
|---|--------------------------|-------------------|---|
| Item Number | Short Description | Discussion | Implementation References |
| | | | <ul style="list-style-type: none">• Administrative Requirements – Responsiveness; Cooperation; and Invoice Detail/Accuracy <p>These evaluation records are available to internal users only, as an information resource and to consider when making decisions regarding potential future procurement actions.</p> |

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| Engineering and Specialty Technical Guidance (Design Output Document Development, Specialty Technical such as welding) | | | |
|---|---|--|--|
| Item Number | Short Description | Discussion | Implementation References |
| 33 | Quality Program Flow down and Technical/Quality Oversight of the supplier | <p>Engineering with QA input on safety related or as requested in high risk non safety related modifications, are responsible to define the quality program flow down to the supplier commensurate with the scope. The integration of the following such items in the specification/scope of work define the overall quality strategy that ensures adequacy of the engineered item upon receipt</p> <ul style="list-style-type: none"> • Technical and functional requirements • Quality program requirements • Engineering deliverables to be submitted by the supplier for approval prior to and during contract execution. • Vendor quality verification actions and records to be retained/shipped with the engineering item attesting to quality. • Oversight hold and witness points and QA programmatic surveillances during contract execution to ensure vendor contract compliance health during execution. • Testing requirements such as factory acceptance testing, on-site acceptance testing, etc. <p>Engineering lead specification/scope of work developer(s) and quality team members should be able to defend the integrated strategy of these type items in the specification/scope of work sufficiently combined will sufficiently ensure vendor technical and quality compliance during execution commensurate with the risk/importance of the engineered item. Strategies should find issues as early as possible in execution to limit impacts.</p> | <p>The Materials and Fuels Complex at INL employs the following procedure to assure consistency in quality requirements flow downs:</p> <p><i>SP-20.6.5 "MFC Procurement Clause Requirements"</i></p> <p>At Savannah River, this guidance is provided in the suite of procedures in Manual 3E, Procurement specification procedures.</p> |
| 34 | EFCOG developed procurement best | Several best practices have been developed in EFCOG over recent years as listed below: | See EFCOG Best Practice Website at Best Practices – EFCOG.org |

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| Engineering and Specialty Technical Guidance (Design Output Document Development, Specialty Technical such as welding) | | | |
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| Item Number | Short Description | Discussion | Implementation References |
| | practices relative to welding activities. | <p>Engineering (EPSG) or QA Best Practices and Documents related to Procurement</p> <ul style="list-style-type: none"> • BP-231, Welding Requirements Flow-Down • BP-216, Filler Material Control – Receipt, Storage and Issue • BP-215, Welding in Support of Research and Development • BP-201, Welding Program Ownership • BP-191, On-Site Review and Assessment of Subcontractor Welding Programs, Facilities, and Operations • BP-162, Improving the Quality of Subcontractor Welding <p>Sites should consider these practices as appropriate.</p> | |
| 35 | EFCOG developed procurement best practices relative quality oversight and commercial grade dedication activities. | <p>Engineering (EPSG) or QA Best Practices and Documents related to Procurement</p> <ul style="list-style-type: none"> • BP-142, Evaluation and Acceptance of Commercial Grade Items and Services • BP-140, Performance of Commercial Grade Surveys <p>Links to additional resource materials</p> <ul style="list-style-type: none"> • Eval & Acceptance of Commercial Grade Items & Services • Performance of Commercial Grade Surveys <p>Link to DOE Handbook DOE-HDBK-1230-2019, Commercial Grade Dedication Application Handbook:</p> <p>https://www.bing.com/search?q=doe+cgd+guide&cvid=4d47bd3efb4e4ba1b854767af23e3c38&FORM=ANAB01&PC=U531</p> | See EFCOG Best Practice Website at Best Practices – EFCOG.org and other links provided in discussion. |

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| Engineering and Specialty Technical Guidance (Design Output Document Development, Specialty Technical such as welding) | | | |
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| Item Number | Short Description | Discussion | Implementation References |
| 36 | EFCOG developed procurement best practices relative to select safety and health program requirements. | <p>Engineering (EPSG) or QA Best Practices and Documents related to Procurement</p> <ul style="list-style-type: none"> • BP-207, Identification of Look-Alike Electrical Equipment • BP-202, Lines of Inquiry for Flow down of Requirements and Subcontractor Implementation of 1-CFR-851 • BP-166, Process for Safe, Efficient Laser Service Subcontractor Work | See EFCOG Best Practices Website at Best Practices – EFCOG.org and other links provided in discussion. |
| 37 | Commercial Grade Dedication deliverable requirements for safety related specifications | <p>In many safety related specifications, sites permit the vendors to utilize Commercial Grade Dedication (CGD) activities as the primary method of acceptance. Typically, the vendor is qualified to perform these activities during qualification audits prior to award. However, there have been significant lessons in the complex where vendors do not perform adequate dedication plans for items due to misunderstanding the safety functions, etc. Sites should ensure specifications clearly identify the nuclear safety functions of Systems, Structures, and Components in the specification/scope of work or the critical characteristics. Sites should also consider requiring the vendors to submit what items they plan to utilize the CGD process on in contract execution and require the specific CGD's to be submitted as engineering deliverables to be approved by the buyer engineering to ensure the specific CGD properly defines the safety functions of the item and that the dedication methods and acceptance criteria are adequate. This review should occur PRIOR to permitting the vendor to dedicate material per that CGD. This approach will significantly reduce risk of the supply chain performing CGD's. The completed dedication plans would typically be submitted as quality records at completion of the contract as well demonstrating the material dedication was completed adequately.</p> <p>In cases where the purchaser is the design authority for a build to print contract, providing the supplier with the critical characteristics can prevent</p> | Savannah River Remediation, Hanford, LANL, and Idaho have adopted this strategy for complex acquisitions and can provide examples of this approach being executed. |

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| Engineering and Specialty Technical Guidance (Design Output Document Development, Specialty Technical such as welding) | | | |
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| Item Number | Short Description | Discussion | Implementation References |
| | | a “bring me a rock” scenario where the supplier does their best to develop a technical evaluation. When critical characteristics are not provided, it can result in multiple submittal cycles to approve a supplier CGD plan. Additionally, it can result in a more costly dedication as the supplier will typically take a more conservative approach than what is required to achieve reasonable assurance. | |
| <p>The following items numbered 38 to 55 are typical Engineering (or other) product inputs in preparation of specifications. These engineering outputs need to be formally issued/complete OR sufficiently developed to accurately translate engineering information into specifications/scopes of work. The more mature this information is, the less risk there is in developing the specification/scope of work. The less mature the deliverables are, the more the site needs to ensure the acquisition is updated to new information as the contract is executed (e.g., new safety functions, new functional requirements, etc.). This information is also needed to determine the acquisition strategy such design/build, build to site print, etc. The list below is broad but may not be required at every site or acquisition.</p> | | | |
| 38 | Functions & Requirements, Functional Design Criteria, Modification Work Travelers, and Data Sheets | Information gathered from various sources which defines the design inputs or modification scope which form the basis for developing and accepting design outputs. | Hanford Tank Farms procedure for developing design inputs (TFC-ENG-DESIGN-C-56) is used to support SOW and specification development, as needed. At Savannah River site, design inputs and Task Requirements and Criteria documentation is governed by E7 Manual, Conduct of Engineering. |
| 39 | Drawings, Process & Instrumentation Diagrams, And Logic Diagrams | Drawings constitute a technical baseline which serve as the basis or physical description of structures, systems, and components. The technical baseline is the starting point for new systems or modifications to existing systems. | Hanford Tank Farms procedure for developing drawings (TFC-ENG-DESIGN-C-09) is used to support SOW and specification development, as needed. At Savannah River, procedure E7 2.30, Drawings supports development of these engineering outputs. |
| 40 | Calculations | Calculations are an analysis that links plant documentation to design requirements and provides a quantitative basis for design. | Hanford Tank Farms procedure for developing calculations (TFC-ENG-DESIGN-C-10) is used to support SOW and specification development, as needed. |

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| | | | At Savannah River see procedure E7 2.31, Engineering Calculations. |
| 41 | Code Of Record | Code of record serves as the set of requirements that are used to design, construct, operate, and decommission a nuclear facility or a mission critical non-nuclear facility over its lifespan. The code of record includes requirements invoked during the design phase and is part of the turnover documentation from the design phase. | <p>Hanford Tank Farms procedure for developing a code of record (TFC-ENG-DESIGN-C-57) is used to support SOW and specification development, as needed.</p> <p>At Savannah River, the requirement to define the Code of Record for major projects is included in SRR Manual S23, LW Conduct of Project Management, Procedure 1.1, Project Management Manual System Description and Engineering Guide 10011-G, Design Criteria for Structures, Systems and Components.</p> <p>See Engineering (EPSG) Best Practice on Code Of Record BP-247, "Experience In Executing The Code Of Record".</p> |
| 42 | Natural Phenomena Hazards Criteria | Natural hazards due to environmental and climatological conditions to be addressed in the design of facilities, structures, systems, and components which are necessary to provide protection from seasonal changes. | <p>Hanford Tank Farms procedure for defining natural hazards inputs (TFC-ENG-STD-02) is used to support SOW and specification development, as needed.</p> <p>At Savannah River, guidance for NPH criteria is included in Engineering Standard WSRC-TM-95-1, Standard 01060, Structural Design Criteria. This is one of many engineering standards and guides that support engineering standards execution at Savannah River Site ranging from radiological design criteria, electrical designs, pressure protection, human factors, ANSI/ISA-84.00.01-2004, Functional Safety: Safety Instrumented Systems for the Process Industry Sector implementation, etc. Requirements</p> |
| 43 | Human Factors | The requirements of the system user or operator are systematically evaluated as a part of the design process that are important to safety to ensure public, facility, and personnel risks are minimized. Decisions | Hanford Tank Farms procedures for developing human factors inputs (TFC-ENG-STD-01 & TFC-ENG-DESIGN-D-29) are used to support SOW and specification development, as needed. |

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| | | concerning which system functions to allocate to the human versus the machine are determined by analyses of system functions and a comparison of human capabilities and equipment capabilities for the system functions | At Savannah River, see procedure E7 2.18, Human Factors Engineering Plan. |
| 44 | Failure Mode & Effects Analysis | Safety or reliability failure modes and mechanisms are evaluated systematically to provide a basis for the selection, monitoring and maintenance of a system or component. This is an engineering function that is most typically performed as part of the design and safety analysis. Repeating this activity within the commercial grade dedication process can be redundant. | Hanford Tank Farms procedures for developing safety/reliability-based failure analyses (TFC-ENG-DESIGN-C-45 & TFC-ENG-FACSUP-D-01.3) are used to support SOW and specification development, as needed. At Savannah River, see procedure E7 2.62, Single Failure Analysis. |
| 45 | Facility/System Design Descriptions | The requirements and responsibilities for the preparation, review and approval and release of Facility Design Descriptions (FDD) and System Design Descriptions (SDD) should be specified in procedures or guides. These documents define the functions, performance, design, physical, testing, interface, operating, and maintenance requirements for the life cycle of a Structure, System or Component (SSC), provide a justification for the design requirements and the design features provided to meet those requirements. Procedures/guides should address the use of FDDs and SDDs to define the design input for modifications. | At Savannah River, procedure E7 2.19, Facility Design Descriptions and System Design Descriptions provide guidance for FDD and SDD development. This procedure is primarily target for new safety related systems in projects under DOE Order 413.3B, Program and Project Management for the Acquisition of Capital Assets. FDD and SDD templates are provided in engineering guide document WSRC-IM-93-18. System Design Descriptions (SDDs) are no longer used at the Hanford Tank Farms and have been replaced by electronic System Notebooks (TFC-ENG-FACSUP-D-01.2), which contain all required information outlined in DOE-STD-3024-2011 for SDDs. |
| 46 | Process Hazards Analysis | The hazards analysis process is integral to the design and engineering process, including evaluation of new or modified designs, processes, or operations. The process is used to identify and evaluate hazards covering the range of hazardous conditions and is iterative because new | Hanford Tank Farms procedure for developing a process hazards analysis (TFC-ENG-DESIGN-C-47) is used to support SOW and specification development, as needed. |

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| | | or modified designs, processes, or operations, can take place during any phases covering design, construction, commissioning, and operations. | At Savannah River, this is included in procedure SCD-11, Consolidated Hazard Analysis Process (CHAP) Program and Methods Manual. |
| 47 | Preliminary Safety Analysis and Existing DSA/TSRs | Preliminary and existing safety analysis documentation is the set of requirements that bound the design of systems, structures, and components within the facility. These design requirements include consideration of safety, plant availability, efficiency, reliability, and maintainability. | <p>Hanford Tank Farms procedures for developing preliminary, new, or revised safety analyses (TFC-ENG-SB-C-01 & TFC-ENG-SB-C-15) are used to support SOW and specification development, as needed.</p> <p>At Savannah River, this is defined in manual 11Q, Facility Safety Documentation suite of procedures.</p> |
| 48 | Safety Basis Strategy and Safety Design Strategy | <p>Acquisitions often require a new or revised safety basis to support the engineered equipment safety requirements. In these cases, the safety basis develop may be an iterative process with the engineering design/engineered item procurement scope, particularly if the engineered procurement includes design and fabrication. In these situations, an integrated strategy to perform the acquisition in parallel with safety basis development is essential to define and include key elements in the specification/scope of work to execute the engineered procurement. Documented strategies in the preliminary design phases of projects is key to enable success as the project matures. DOE Standard 1189, Safety in Design requires these safety design strategies to be developed. To examples are as follows</p> <p>Safety Basis Strategy (SBS). The SBS is established early in project/modification or proposed activity life and dictates the approach that will be taken for major decisions associated with establishing or revising a safety basis (for modifications not associated with DOE Standard 1189-2016, Integration of Safety in the Design Process, new facility, or major modification definitions). The SBS provides a common understanding of the management expectations, scope, roles and responsibilities, strategy, and methods to be used. It provides direction</p> | <p>At Savanna River, procedures 11Q 1.13 Safety Design Strategy, and 11Q 1.10 Safety Basis Strategy provide guidance.</p> <p>Hanford Tank Farms procedure TFC-ENG-SB-C-06, "Safety Basis Development", addresses DOE nuclear facility hazard categorization, safety basis planning, and preparation of safety basis documentation including the initial safety design strategy (SDS).</p> |

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| | | <p>to the cognizant personnel performing design, procurement, analyses, and documentation; serving to coordinate the activities of all responsible organizations.</p> <p>Safety Design Strategy (SDS). An SDS, as required by DOE-STD-1189-2016, Integration of Safety into the Design Process, establishes the approach to be taken regarding major decisions associated with the safety of a new facility or major modification project associated with Hazard Class I, II or III nuclear facilities. It provides a strategic road map for addressing important safety issues in the project design and for developing key safety documents.</p> | |
| 49 | Commercial Grade Dedication Documentation | Documentation of activities that are performed to ensure the safety functions of safety-significant systems, structures and components and services are preserved and are suitable for use in the intended application to perform its safety function. | <p>Hanford Tank Farms procedure for developing commercial grade dedication documentation (TFC-ENG-DESIGN-C-15) is used to support SOW and specification development, as needed.</p> <p>At Savannah River, see procedure E7 3.46, Replacement Item Evaluation/Commercial Grade Dedication.</p> |
| 50 | Environmental Requirements & Permits | Identification and integration of applicable environmental requirements with current and planned activities are required to satisfy legal and contractual commitments, assuring that regulations are identified, considered, and implemented through the work planning and management processes. | <p>Hanford Tank Farms procedure for defining environmental requirements documentation inputs (TFC-ESHQ-ENV-STD-10) is used to support SOW and specification development, as needed.</p> <p>At Savannah River, all modifications require evaluation for inclusion of necessary environmental permit requirements (e. g., air, water, Federal Facility Agreements, etc.). This is driven by procedures E7 2.05, Modification Traveler and for larger modifications via Task Requirements and Criteria (TR&C) modification input documents governed by WSRC-IM-98-00033, Appendix H, TR&C Guide.</p> |
| 51 | Quality Assurance Procurement Clauses | Procurement quality clauses are used for the acquisition of engineered items and services. These clauses establish contractual obligations for quality program systems, identification, traceability, document submittals, | <p>Hanford Site procurement quality clauses (Clauses B01 – B88) are divided into the following functional subject areas:</p> <ul style="list-style-type: none"> • Pre-award and Supplier Fabrication |

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| | | testing, reporting, qualification, special controls, inspections, etc. The use of pre-established clauses provides a simplified approach to communicate quality requirements to vendors and suppliers within the procurement documents and applicable Statements of Work (SOWs) or specifications. Selection of clauses are tailored to the item or service to be procured. | <ul style="list-style-type: none"> • Material Identification • Testing and Test Data • Inspection and Acceptance Criteria • Material Handling |
| 52 | Vendor Processes | The process used to provide a consistent document control method for submitting, processing, and capturing vendor submittals and other associated documents. Vendor/procurement record information submitted for review/approval, or as vendor information prior to final acceptance of a subcontractor's product or service. | <p>Hanford Tank Farms procedure for vendor submittal documentation (TFC-BSM-IRM-DC-C-07) is used to support SOW and specification development, as needed.</p> <p>Savannah River provides this guidance within each specification on Engineering Document submittal processes and approval methods as outlined in site 3E Procurement Manual. For Quality Record submittals with final product shipment see effectiveness element 28 on SRS QVDR processes above for additional information.</p> |
| 53 | Engineering Specification Development | Engineering specifications define the functions, performance requirements, and design requirements for a new system, or a modification to an existing system. The configuration of a system evolves during system design from its functions, performance requirements, and design requirements. Engineering specifications establish the minimum requirements levied on the system and clearly define interfaces. | <p>Hanford Tank Farms procedure TFC-ENG-DESIGN-C-01 is used to support engineering specification development.</p> <p>At Savannah River see 3E Procurement Manual and procedure E7 3.10, Determination of Quality Requirements for Procured Items and 2.14, Specifications.</p> |
| 54 | Procurement Specification Development | Procurement specifications include the fundamental requirements, applicable codes, and standards for SSCs. Project, system, or facility specific design criteria and performance requirements which support the procurement specification may include engineering documentation covering the technical attributes which address, but are not limited to: safety class, quality level, storage level, shelf life, etc., and evaluation criteria used for preparation of procurement requirements, commercial grade dedication, procurement requirements for safety class items, quality assurance, and waivers. | <p>Hanford Tank Farms procedure TFC-ENG-DESIGN-C-34 is used to support procurement specification development. At Savannah River this is included in the 3E Procurement Specification Procedures Manual.</p> |

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| 55 | Technology Development Plans | In some projects or acquisitions, a mature technology to perform a desired mission does not exist. In these circumstances, a dedicated Technology Development Plan (TDP) is necessary to validate suitability of a technology to perform a mission need and may be required to be performed prior to or integrated with an engineered item acquisition strategy. This technology maturation plan is particularly important to develop if the acquisition is part of a project under DOE Order 413.3B, Program and Project Management for the Acquisition of Capital Assets, where Technology Maturation is part of the gating criteria for the Critical Decision (CD) processes moving from CD-1 through to CD-3. The need for a TDP is typically identified in the pre-conceptual phase of a modification | <p>At Savannah River, requirements for technology develop plans are included in E7 Conduct of Engineering Manual, procedure 2.07, Technology Development Plans.</p> <p>The Hanford Tank Farms approach to identify, manage, and execute technology maturation in support of mission goals is performed in accordance with plan TFC-PLN-90, "Technology Maturation Management Plan", with specific implementation guidance provided in procedure TFC-PRJ-TD-C-01, "Technology Maturation Management".</p> |