Conduct of Engineering
Request for Variance or Alternate Method

To display the *VAR Request Metadata* pane for this document, click **File > Info > Properties > Show Document Panel.**

1.0 General

1.1 Document Number: VAR-10613	1.2 Revision: 0

1.3 Brief Descriptive Title: Systems Engineering Roles and PIE-3 (ESM Chapter 20)

1.4 Affected Program: Engineering Standards	1.5 Request Type: Alternate Method
1.6a Affected Tech Area 99	1.6b Affected Buildings Sitewide

1.7 Requestor: Eng, Arnold Jesse   Organization: PIE-3
              Schwab, Ben, PIE-3

1.8 Revision History
 Revision Number   Changes and Comments
  0   Initial issue.

2.0 Affected Conduct of Engineering Program/Documents

2.1 Affected "P" Document: P342 Engineering Standards If against the P document itself, revision (or *N/A*): N/A	2.2 Subordinate or related document(s) [AP, master spec, LANL ESM chapter & section; or code, Order, standard, etc.]: Document Title/No.: Engineering Standards Manual (ESM) Chapter 20, Systems Engineering (SE), SE Requirements Revision 0, 09/20/2017 Document Title/No.: Enter text.. Revision Enter text.. Document Title/No.: Enter text.. Revision Enter text..

2.3 Section/Paragraph: Table SE-GEN-1 Roles, Responsibilities, Authorities, and Accountabilities (SE-focused) and related Sections described in Section 3.4 of this Alternate Method.

2.4 Specific Requirement(s) as Written in the Document(s):
Excerpts from Table SE-GEN-1 Roles, Responsibilities, Authorities, and Accountabilities (SE-focused).
KEY ORGANIZATIONS.

Design Authority/ Site Chief Engineer[8]	Establish and Oversee the FSE Program	• Owner of the FSE Program • Develop policy, procedures and guides for use by projects • Provide direction and support for SE program rollout and implementation on projects • Manage FSE personnel and project assignments • Provide SE personnel training and development opportunities • Coordinate the FSE program	• Accountable to the Associate Director for Nuclear & High Hazards Operations for the definition and development of the FSE program	• Direct implementation of the FSE Program • Approve SEP • Approve final selection of Design Agency • Approve RCD for projects subject to this chapter (along with FDAR).

- Section 1.2, Footnote 6
  - When tailoring this standard for other project scenarios, refer to the SE Planning (SE-PL) section and obtain LANL Site Chief Engineer concurrence.
- Section 3.1 Project Life Cycle Stages and Reviews, Part B.1
  - "Tailor the activities of this chapter to address the specific phases, acquisition strategy, and SSCs within project scope with the concurrence of the Design Authority (Site Chief Engineer)."
- Section 3.3 Acquisition Planning, Part A.5
  - "Evaluate adequacy of the bidding Design Agencies. The LANL Design Authority shall approve final selection of Design Agency. Refer to "Design Agency Selection Criteria for Award" in the SE Guide, SE-PLG section."
- Section 3.10 Systems Engineering Deliverables Summary, Table SE-PL-1
  - DA (Chief Engineer) Approves the Requirements & Criteria Document as stated in Table SE-PL-1. No. 8.
- Section 4.1 Technical Baselines, Table SE-RM-1: Project Technical Baselines and Associated Deliverables
  - For the sake of simplicity, this chapter emphasizes the conceptual, preliminary, and final design phase elements assuming the award for design was made. When tailoring this standard for other project scenarios, refer to Section SE-PL and obtain LANL Site Chief Engineer concurrence.

2.5 Contractual, preference, or other basis for requirement in 2.4:

LANL preference. Revision 0 of ESM Chapter 20, SE Requirements, is largely based on a previous parent company's vision for the Engineering Services (ES) Division Leader role. (Since then, ES and other organizations under the purview of the Directorate for Operations have undergone reorganization.)

2.6 Type of VAR from ESM Chap 1, Z10 [*Applies only to standards variances*) Type 2	2.7 Discipline Other Disciplines Systems Engineering

3.0 Request Information & Comments

3.1 NCR required (work has occurred)? No If Yes, NCR Number: Enter text.	

3.2 System/Component Affected OpSystem Acronym & Name [Select OpSysAcronymAndName] System Number or Name [Select SystemNumberOrName]	3.3 Highest ML Level ML-1

3.4 Proposal with Justification/Compensatory Measures:

Background

The roles, responsibilities, authorities, and accountabilities (R2A2) material in ESM Chapter 20 describes the intent to establish Facility SE (FSE) capability to "provide excellence in project execution through the application of Systems Engineering principles and methods." This was based on the organizational structure used when the chapter was written and is shown in Table SE-GEN-1. Subsequently, the organizational structure has shifted, and with it the R2A2 thinking. A key organizational change was the creation of the Plutonium Infrastructure Engineering (PIE) division which includes PIE-3 Systems Engineering. As this group was created, PIE-3 absorbed several responsibilities and authorities outlined below.

Proposal

This alternate method proposes a substitution to the ESM Chapter 20's Table SE-GEN-1 Roles, Responsibilities, Authorities, and Accountabilities (SE-focused) and related text throughout ESM Chapter 20. The table below describes the proposed changes to ESM Chapter 20's Table SE-GEN-1. **Bold text** describes new additions, and strikethrough text describes subtractions.

Position	Role	Responsibility	Accountability	Authority
~~Design Authority/Site Chief Engineer~~	~~Establish and oversee the FSE Program~~	• ~~Owner of the FSE Program~~ • ~~Develop policy, procedures and guides for use by projects~~ • ~~Provide direction and support for SE program rollout and implementation on projects~~ • ~~Manage FSE personnel and project assignments~~ • ~~Provide SE personnel training and development opportunities~~ • ~~Coordinate the FSE program~~	• ~~Accountable to the Associate Director for Nuclear & High Hazards Operations for the definition and development of the FSE program~~	• ~~Direct implementation of the FSE Program~~ • ~~Approve SEP~~ • ~~Approve final selection of Design Agency~~ • ~~Approve RCD for projects subject to this chapter (along with FDAR)~~
ES Division Site Chief Engineer (SCE)	**Establish and oversee the FSE Program**	• **Own FSE Program Policy (e.g., ESM Ch. 20)** • **Provide direction and support for SE program rollout and implementation on projects** • **Coordinate the FSE program with other NSP Divisions**	• **To ALDFO NSP**	• **FSE Program policy, direction, and coordination**
PIE-3 Systems Engineering Group Leader	**Implement FSE Program for PIE; support**	• **Upon request of SCE, develop policy, procedures and guides for use by projects and provide direction and support for SE**	• **To PIE Division Leader** • **To ES Division Site**	• **Direct Implementation of the FSE Program for PIE**

	others as requested	program rollout and implementation on projects		Chief Engineer (SCE) and COE Program Leaders		**Approve SE software tools for use by PIE projects**
		• **Manage FSE personnel and project assignments within PIE** • **Provide SE personnel training and development opportunities.** • **Coordinate the FSE program with other NSP Divisions** • **Provide recommendations on the selection of a Design Agency to the Project Engineer (PE)**				
Lead Systems Engineer	Perform as the requirements owner for the Functional Specification	• Establish the SE tool • Ensure complete allocation of the initial Requirements Baseline • Validate requirements • Generate systems specifications, ICDs, FDDs and SDDs • Specify verification requirements for the Functional baseline • Balance and integrate requirements across facilities and systems		• Accountable to the LPE for implementation of assigned requirements		• Functional Specification approval • **Develop RCD for projects subject to this chapter**

In summary, the following changes are made:

- For better clarity, the Design Authority/Site Chief Engineer is removed from the table. The Site Chief Engineer (SCE) position/row is added to assume some of the R2A2 content previously held by the LANL Design Authority. Note: LANL Design Authority approval for Requirement & Criteria Documents is still required for projects within the scope of DOE-STD-1189 per AP-341-602, *Requirements and Criteria Document*.
- A new position/row labeled "PIE systems engineering group leader" is added to assume a portion of the R2A2 content previously held by the LANL Design Authority.
- Subsequent references to the Design Authority throughout ESM Chapter 20, *SE Requirements* are replaced with Site Chief Engineer or PIE Systems Engineering Group Leader in alignment with the table unless otherwise noted. Sections include:
  - Section 3.1 Project Life Cycle Stages and Reviews, Part B.1
  - Section 3.3 Acquisition Planning, Part A.5
  - Section 3.10 Systems Engineering Deliverables Summary, Table SE-PL-1
    - LSE is responsible for developing and maintaining the FRD and RCD. LPE and PE is responsible for approving these documents. LANL DA approves the document only when the project is within the scope of DOE-STD-1189 per AP-341-602.
  - Section 4.1 Technical Baselines, Table SE-RM-1: Project Technical Baselines and Associated Deliverables
- Reference to ADNNHO shall be taken to mean ALDFO and, similarly, other 1:1 organizational changes may be assumed.

Justification

This Alternate Method modernizes ESM Chapter 20's R2A2 to the Laboratory's current official policies and organizational structure. Certain SE responsibilities previously held by the Design Authority within the scope of ESM Chapter 20 are assumed by the PIE-3 Group Leader. This Alternate Method enables the Systems

Engineering (PIE-3) group and projects to follow official LANL policies and procedures. Changes are meant to reflect the current state of R2A2s regarding the design authority role.

Note: PIE, in conjunction with Conduct of Engineering, is in the process of revising ESM Chapter 20, Systems Engineering. Once that revision is published, this Alternate Method will become superseded by name.

3.5 Attachments

Document Title or Description n/a

3.6a Project ID	3.6b: Project Name	3.6c: Code of Record Date
N/A	N/A	N/A

3.7 Duration:	3.8a If Finite Period, Start Date:	3.8b End Date:
Lifetime	Click to enter a date.	Click to enter a date

3.8c Provide the PFITS number for tracking removal/correction: [PFITSNum]

3.9 USQD/USID required (Nuclear, High/Mod Hazard)? No

If Yes, USQD/USID Number   Click here to enter text.

3.10 QA Review for process change matters potentially affecting LANL's NQA-1 implementation

Is a QPA Determination required?: No   If **Yes**, then: Choose an item.

QPA Comments: Enter text..

3.11 POC Determination: Accept

POC Comments: Enter text..

3.12 Management Program Owner's (SMPO) Approval for P341 and APs; P342, ESM, ML-1 and -2, and Contract Matters; and P343

SMPO Determination: Accept

Comments: Enter text..

4.0 Participant Signatures   NOTE: *DO NOT ADD NAMES FROM WITHIN WORD! Save and close the form first, then do 1-4 below:*

1. *From the SharePoint library, select the document, then click the **ellipsis (…)** in the second column; a small dialog appears*
2. *In the small dialog click the **ellipsis** again*
3. *Click **Edit Properties** and check out the document if prompted to Enter names using the controls provided, then **Save***

4.1 POC (Management Program Owner's Representative): Oruch, Tobin H	Organization ES-FE	Signature

4.2 Facility Design Authority Representative [FDARName] FDAR signature not required ⊠	Organization N/A	Signature
4.3 LANL Owning Manager (FOD or R&D/Program) [FODorPrgmMgrName] FOD or Program Manager signature not required ⊠	Organization N/A	Signature
4.4 Quality Reviewer's Name: [QPAName] QPA review/signature not required ⊠	Organization N/A	Signature
4.5 Safety or Security Management Program Owner's Approval for P341 and APs; P342, ESM and Contract Matters; and P343 Richardson, Michael Joseph SMPO signature not required (Type 1 variance) ☐	Organization ES-DO	Signature
4.6 Additional Signer 1 Frers, Christopher James Role: PIE-3 Group Leader	Organization PIE-3	Signature
4.7 Additional Signer 2 [AdditionalSigner2] Role: Enter text.	Organization Enter text.	Signature

4.8 CoE Administrator Signature Leyba, Matthew Anthony NOTE: The CoE Admin is always the last signature placed on this document. The date of that signing is the date of this document.	Signature