Engineering Services Division

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LANL Engineering Services (ES) Division

- Mission
  - Provide facility and system engineering support to Operations and Maintenance for Facility Management organizations, and to provide design and project engineering services of projects, throughout the Laboratory
- Key Personnel
  - Jim Streit – Division Leader
  - Jason Apperson – Deputy Division Leader (Acting FE)
  - Dennis Graves – Deputy Division Leader EPD
- Engineering Services
  - Engineering Groups for each Facility Organization
  - Design/SME Engineering
  - Project Engineering
  - Fire Protection Engineering
- Activities Supported
  - LANL Building Official program / LANL Fire Marshal
  - Site-wide modification design for all disciplines
  - Design review and approval (internal & external)
  - Institutional Engineering SMEs
  - Project support

LANL Process for Engineering Execution

- LANL Engineering Standards Manual (ESM)
  - The standards are a consolidation of DOE regulatory requirements; industry consensus standards, codes, and regulations; State of New Mexico codes and regulations; AND specific requirements for LANL
- LANL Master Specifications
  - Provides LANL-specific requirements and guidelines for the procurement, installation and testing of engineering designs.
  - The specifications complement the requirements in the ESM and identify which submittals are required in support of a engineering design or construction activity.
- LANL CAD Standards Manual
  - Provides LANL-specific requirements and guidelines for the development and production of engineering drawings. This ensures consistency in the engineering drawing packages, minimizing rework.
- LANL Conduct of Engineering (CoE) Procedures (APs)
  - Provides documented systematic processes and procedures for the execution of LANL engineering activities. Includes processes for defining engineering scope and requirements for a project. The APs may apply to the engineering subcontractor (rarely, where invoked)

LANL Process for Engineering Execution

- ***LANL VIEWS PROJECT DESIGN IN FOUR PHASES***

  - **TITLE I** – CONCEPTUAL AND PRELIMINARY DESIGN When engineering concepts are established and documented (Drawings, Specs & Calcs).

  - **TITLE II -** DETAILED DESIGN PHASE of a Project. Engineering is completed, verified and reviewed and approved for issue to construction.

  - **TITLE III -** CONSTRUCTION PHASE of the Project where equipment is ordered, installed and tested according to the final design.

  - **TITLE IV** – Is handover to the owners and Close-Out of the Project final documentation.

LANL Engineering Deliverables (Typical)

- Engineering Calculations
- Drawings
  - Architectural
  - Civil/Structural
  - Mechanical
  - Electrical
  - Process/Piping/Fire Protection/Security/I&C
- Pressure Safety Packages
- Procurement Specifications
- Construction Specifications
- Test and Inspection Plans

LANL Use of Engineering Firms

- LANL has a standing task order contract (IDIQ) with six prime engineering firms. Each prime engineering firm as multiple lower-tier subcontractors. The task order contract is re-competed every 5 to 7 years.
- For Design-Build projects, a specific contract will be developed that can have an engineering firm that is not part of the IDIQ contract.
- For unique task that cannot be supported by the IDIQ engineering firms, a specific task order contract can be issued.

LANL Contracts and Documents

- **KEY ENGINEERING DOCUMENT REQUIREMENTS ARE IN THE EXHIBIT "D"** – It defines the scope of the task and documentation requirements for a LANL specific project

- **PROCUREMENT PACKAGES CAN BE VERY INTIMIDATING**
  - Large volume of documents
  - Very detailed and specific
  - Refer to many DOE and National Standards

- **Historical Issues with A&Es**
  - Not meeting design submittal (deliverable) requirements; lacking in specified information
  - Document review requirements: submitting incomplete designs or not addressing comments
  - Pressure safety requirements; not having a full understanding of ASME B31 or B&PVC.
  - LANL's Seismic Design Category "D" requirements: LANL site is well characterized and exceeds the criteria for Seismic Design Category "C" requirements

Engineering Services ‘Needs’

- Specialty Design & Design-Build Subcontractors
  - Horizontal directional drilling
  - HDPE installation
  - Traffic pattern studies, Traffic control systems
  - Seismic/Structural/Geotechnical
  - Pressure Safety (ASME B31-series, B&PV code)
- A/Es and Fabricators for Nuclear Facility Processes
  - Gloveboxes, experimental enclosures, confinement systems
- 3rd Party IBC Section 110 and Chapter 17 Special Inspection Agencies