

Appendix S

Engineering Execution Plan

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Engineering Execution Plan Example Workscope

The following engineering execution plan workscope example is provided to show typical key milestones and deliverables required or successfully implementing a major project such as the Biomass/Cogen project. The project's engineering workscope tasks and key engineering discipline areas of responsibility are defined as it relates to the OWNER, OWNER'S ENGINEER, PROJECT ENGINEER,, EPC Contractor, or other Contractor and Vendor responsibilities.

Table 1: Engineering Execution Plan Workscope

<i>Process</i>	<i>How</i>
Project Start	PROJECT ENGINEER Design Basis template to OWNER and OWNER'S ENGINEER for review,
Design Basis	OWNER, OWNER'S ENGINEER and EPC Contractor signoff, PROJECT ENGINEER to finalize
PFD	OWNER'S ENGINEER to review with OWNER, update and forward to PROJECT ENGINEER for final detail
Meeting/Design Eng. Starts	PROJECT ENGINEER, EPC Contractor and OWNER make final Biomass/Cogen changes
P&ID	OWNER'S ENGINEER to review and update, PROJECT ENGINEER to provide final detail, no major changes
Building/MFG Process	OWNER'S ENGINEER to provide information, PROJECT ENGINEER to incorporate necessary detail and finalize
General Arrangement	OWNER'S ENGINEER to provide building information, PROJECT ENGINEER to detail and finalize drawings
Process Descriptions	OWNER'S ENGINEER to provide information, PROJECT ENGINEER to detail and finalize descriptions

<i>Specialty Process</i>	<i>How</i>
Code Review (See Environmental)	OWNER'S ENGINEER to provide information, PROJECT ENGINEER to detail and finalize recommendations
Chemical Delivery	OWNER'S ENGINEER to provide information, PROJECT ENGINEER to detail and finalize drawings and schedules
Process Req.'s, Utility Summary.	OWNER'S ENGINEER to provide information, PROJECT ENGINEER to detail and finalize schedules
Process Verification Meeting	PROJECT ENGINEER, EPC Contractor, OWNER finalize all Biomass/Cogen changes.

Table 1: Engineering Execution Plan Workscope(con)

<i>Mechanical</i>	<i>How</i>
Piping Plan	PROJECT ENGINEER to design and approve, OWNER'S ENGINEER review
Piping Section	PROJECT ENGINEER to design and approve, OWNER'S ENGINEER review
Piping Specifications	PROJECT ENGINEER to develop and propose, OWNER'S ENGINEER review
Prefab Piping Iso's (1st 33%)	PROJECT ENGINEER does 1st 1/3 prefab iso's for spools
Prefab Verification Meeting	PROJECT ENGINEER, Contractor/Vendor, and EPC Contractor review prefab iso's
Equipment List and Review	PROJECT ENGINEER lists tagged equipment, service cond's, reconcile P&ID
Tank & Nozzle Drawing	OWNER'S ENGINEER/EPC Contractor define requirements, PROJECT ENGINEER details, approves
Pump specifications	Spec'd EPC Contractor vendor. PROJECT ENGINEER calculates, finalize, approves
Progress Review Meeting	PROJECT ENGINEER, Contractor/Vendor, and EPC Contractor review and plan
Prefab Piping Iso's (2nd 33%)	PROJECT ENGINEER does 2nd prefab iso's for spools
Prefab Verification Meeting	PROJECT ENGINEER, Contractor/Vendor, and EPC Contractor review prefab iso's
Prefab Piping Iso's (3rd 34%)	PROJECT ENGINEER does prefab iso's for spools
Prefab Verification Meeting	PROJECT ENGINEER, Contractor/Vendor, and EPC Contractor review prefab iso's
Field Piping Iso's	PROJECT ENGINEER does field iso's for spools for pipe > 2.0-inch
Field Piping Review Meeting	OWNER'S ENGINEER/PROJECT ENGINEER, EPC Contractor and Contractor/Vendor meet per field piping
Piping Material Takeoff	PROJECT ENGINEER to take P&ID and do takeoff, OWNER'S ENGINEER review.

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<i>I/C</i>	<i>How</i>
Instrument System Design	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Instrument Control Loops	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Instrument Monitor Loops	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Instrument Schedules	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Instrument Specs/Data sheets	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Instrument Installation Details	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
PLC Prog/Tuning/Training	Finalize for programming, for tuning, and for training
MMI	Develop for screens per system, and for total systems.
Instrument Location Diagrams	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
System Specifications	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review

<i>Electrical</i>	<i>How</i>
Electrical One Lines	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Control Diagrams	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Electrical Schedules	PROJECT ENGINEER, EPC Contractor Bill of materials and special specifications
Load List	Update current EPC Contractor format to PROJECT ENGINEER format
Building/Fac. Coordination	Interface with Building, routings, boilers, conduit supports
Equipment data sheets, drawing rev	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Wiring Diagrams (interconnection)	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review

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<i>Civil/Structural</i>	<i>How</i>
Equipment Foundations	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Building Facilities Review	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Ladders/Platforms/Mounts	PROJECT ENGINEER to generate, finalize and approve w/ OWNER'S ENGINEER review
Pipe Supports	Make an initial assumptions about loads for building and support the rest with independent supports
Misc. Other	OWNER'S ENGINEER, EPC Contractor to recommend, PROJECT ENGINEER to finalize, approve

<i>Environmental</i>	<i>How</i>
Code Review (air, effluent)	OWNER'S ENGINEER to provide information, PROJECT ENGINEER to detail and finalize recommendations
Environmental Recommendation Package	OWNER'S ENGINEER to provide data and estimates, PROJECT ENGINEER to format and make recommendations to EPC Contractor/OWNER

<i>Project Management</i>	<i>How</i>
PROJECT ENGINEER	Focus on coordinating engineering production for EPC Contractor and Mount Hood Fiber as EPC Contractor's customer
OWNER'S ENGINEER	OWNER'S ENGINEER focus on supporting PROJECT ENGINEER, coordinate contracted facility designer, owner.
Final Approval Meeting	PROJECT ENGINEER, EPC Contractor, Contractors/Vendors, and OWNER to approve

<i>Project Construction/Startup</i>	<i>How</i>
Construction Engineering	PROJECT ENGINEER assists Contractor/Vendor and EPC Contractor per needs
Construction Management	PROJECT ENGINEER assists Contractor/Vendor and EPC Contractor per needs
Startup Services	PROJECT ENGINEER assists Contractor/Vendor and EPC Contractor per needs
Production Start-up & Full Scale Operations	PROJECT ENGINEER assists Contractor/Vendor and EPC Contractor per needs