

Commissioning

Upon completion of construction, ESG will ensure proper operation of the installed systems through a systematic start-up and testing. The final piece of the installation phase is the system commissioning phase. All equipment and systems in the scope of the project will be tested through the entire length of their operating ranges to confirm their energy efficiency. A draft commissioning plan specific to the Howard County (HC) project will be developed and finalized during the Design Phase.

ESG believes that a well-executed commissioning program is essential to ensure that systems operate at their optimum level not only when they are first started up, but over the life of the system. ESG has established a rigorous commissioning program for all ECMs to ensure that equipment and systems are operating as designed before ECM acceptance.

ESG develops its commissioning process in order to achieve a number of goals:

1. To protect our investments in the improvements we make to HC facilities. The future earnings depend on each ECM meeting the guaranteed savings targets; therefore, the completed installation must perform efficiently over the long term.
2. To supplement the training of client O&M staff and to complete the documentation (as-built) process, e.g., design/build or build/own/operate projects.
3. To meet conditions imposed by financing sources, government agencies, and our parent company regarding quality assurance standards.

Commissioning Team

Effective commissioning requires a team effort. ESG assembles each commissioning team based on the needs of the specific project. ESG's commissioning team includes ESG's Project Manager, Construction Manager, design engineers, contractors, equipment manufacturers and other appropriate client (site) representatives.

ESG's Project Manager (PM) facilitates the commissioning process by reviewing and approving commissioning plans, managing commissioning schedules and client communication, assigning commissioning resources, resolving problems, and approving final equipment performance test reports, as-built documentation, and O&M manuals.

ESG's PM is the presiding onsite commissioning/start-up "authority." The PM is responsible for communicating with the client's commissioning agent (if applicable) and onsite operations personnel regarding all commissioning and start-up activities. ESG's PM or a person assigned by him will sign off on applicable testing documents, final equipment performance, as-built documentation, and O&M manuals. ESG has tentatively selected Andrew Miller, Branch Operations Manager, as the PM for the HC project. ESG's Construction Manager provides logistical support to the CA by coordinating onsite start-up activities.

The other members of the team contribute as follows:

- ESG's Design Team is responsible for the design verification of each system and component after installation. The Design Team also provides support as needed to resolve design issues and answer design-related questions.
- Contractors include the general contractor, mechanical contractor, electrical contractor, instrumentation and controls contractor, etc. Contractors are responsible for scheduling and implementing pre-functional testing of all systems and equipment installed by them. Contractors also provide ESG with start-up and full commissioning activities and support as needed.
- Manufacturers provide equipment installation and start-up documentation. For large or complex equipment, manufacturer representatives are responsible for installation inspection, start-up, commissioning, and performance verification for their equipment.

The client's commissioning agent, project manager, or engineer facilitates the commissioning process, acts as a liaison with onsite operating personnel, approves the commissioning plans, witnesses commissioning activities, and signs off on functional and equipment performance tests.

While ESG will utilize internal resources for the commissioning of the HC project, as noted above, our subcontractors play a critical role in installing the equipment and, as such, they will also be involved in its commissioning. However, ESG will retain complete control and responsibility for the commissioning of each proposed ECM.

ESG anticipates that HC, as our client, will also be an integral part of the commissioning process, both as an observer and a participant.