

While often summarily discussed initially, planning for safety and quality are key to maximizing budget, schedule, and wind power production.

EVERYONE PAYS A LOT OF ATTENTION to the four major construction issues: safety, quality, schedule, and budget. Of these, safety and quality are typically the least discussed during the project award process. “Good” quality and safety on wind projects is closely related to “good” cost and schedule, and deserve far more attention. A safe job is completed in less overall time since there is less inefficiency caused by injuries. Similarly, a quality job is completed in less time since it requires less rework. It also has less warranty calls and more overall wind power production over time.

In its simplest form, safety is ensuring that no one gets injured on the job. OSHA establishes workplace rules and limits, but they are minimum standards and do not maximize safety in the workplace. Additionally, the construction industry tracks safety statistics (e.g. as the number of recordable injuries, the Experience Modification Ratio (EMR), the Total Recordable Injury Rate (TRIR), and the Days Away, Restricted, or Transferred (DART rate)) that can help assess a contractor’s safety record compared to other contractors and the industry as a whole.

Safety statistics are important to track, but they are only a part of the evaluation of the effectiveness of a wind contractor’s safety program. To understand a renewable energy contractor’s safety program you need to understand the philosophy of the program. On wind projects, where there are numerous dangerous and life-threatening hazards (trenching, electrical work, crane and other heavy equipment work, etc.), it is helpful to look at the following factors of a safety program:

- Upper level management totally supports the safety program: Safety truly comes first, and profits later.
- All employees have “stop work” authority for safety issues.
- Hazards are identified up front through job hazard analyses and adequate training is provided.
- Safety is evaluated through constant “near miss” and incident investigating and analyses, using actual job data as a leading indicator of areas where additional focus may be needed.
- Safety is an integral part of the job plan (through inspections, safety planning, work permitting process, etc.): A work permit system authorizes work on a daily basis after potential hazards are identified and discussed.

A good quality program is also essential to a project’s budget and schedule compliance. Most wind project designs require adherence to a wide range of engineering standards: IEEE, ANSI, UL, ASTM, ASCE, to name just a few. All of these standards are incorporated into the wind

project design, and a good team will review these at the outset and determine what should be applied to the project in conjunction with the owner and engineer.

A quality wind project begins with the first request for proposals, long before the actual work starts. Quality is then carried to final completion and warranty with checks and audits throughout construction to ensure compliance. A good program treats quality like safety, and empowers all employees with “stop work” authority for quality issues. In addition, a good wind project quality program will have these attributes:

- Procedures for document and record control: Drawings and designs are properly tracked and controlled.
- Procedures for control of material/equipment purchasing, receiving and inspection: Material and equipment is inspected and documented.
- Extensive and specific procedures and guidelines for the performance and inspection of each aspect of the work, with specific substantive quality standards (e.g. checklists, etc.) that ensure that work has been performed in accordance with the design: The heart of the quality program is the specific measuring guidelines used to make sure work is completed according to the plans and within engineering standards.

This last item is particularly important. There is no uniform standard for “quality” in the wind construction industry. Good contractors have developed these standards on their own for each aspect of their work (road standards, concrete placement and rebar standards, trenching standards, electrical cable placement and termination standards, etc.) and can verify and document their quality on all projects.

Signal Energy’s quality program contains QA/QC (Quality Assurance/Quality Control) “travelers” for each aspect of the work. These travelers require verification that hundreds of specific work tasks have been properly completed and measurements obtained. They are an integral part of a comprehensive quality management system that insures that the work is completed according to the design.

In addition to the checks, hold points, and audits, a good quality program for a wind construction project should allow the contractor to learn from its experience. Having a good feedback loop ensures that mistakes are not repeated and the overall operations get better as work continues.

Quality and safety are crucial in adhering to a wind project’s schedule and budget. Spending time up front planning for these issues pays off in the end. 🌬