

Legal Briefing

Managing utility-scale solar construction: contract by communication

The construction of a utility-scale solar array is fraught with risk, creating huge challenges for an EPC team. A skilled project management team is essential timely completion and successful energisation of a project, write David Bashford and Monica Wilson



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Skilled project management by the engineering, procurement and construction (EPC) provider of utility-scale solar power projects is essential to the success of the project. Depending on the project's size, construction activities may continue for months or years, and the EPC provider must coordinate construction of new panel arrays alongside completed and energised arrays in portions of the project. An experienced project team understands these unique complexities and their interrelation with the EPC agreement between owner and EPC provider. The project team implements the terms of the EPC agreement through constant communication with the owner on behalf of the EPC provider, detailing the team's management of the construction process and any issues that arise during the course of the project.

The EPC provider assumes a wide variety of risks entering into a utility-scale solar power project's construction phase. These risks include labour disputes, delivery conflicts, safety compliance, weather delays and environmental, technological, engineering and legal challenges. Early and proactive risk management by the EPC provider's project team translates to success in completion of construction and timely energisation, allowing the owner to meet revenue projections for energy output.

Pre-construction planning: project team risk evaluation

Prior to construction, a skilled project team evaluates the local business environment and the proposed construction site with the goal of anticipating and resolving potential issues. For example, a project team may contact local regulatory authorities to establish positive relationships prior to the start of construction. As utility-scale solar expands into new markets, EPC providers often find local authorities unfamiliar with industry processes and standards. This unfamiliarity may lead to conflict in

interpretation of building codes and inspection standards, especially concerning the required electrical standards and procedures for plant monitoring and security.

As the solar industry matures, regulations applicable to utility-scale solar projects will become more standardised, with leading EPC providers acting as advocates for establishing uniform regulations. As part of this effort, the proactive project management team establishes an early alliance with inspectors and other officials. Some EPC providers even offer educational courses in solar technology and engineering as a service to local authorities. These measures assist the EPC provider by identifying potential conflicts with regulatory authorities' interpretation of codes and standards, and allow the project team to work with authorities and the owner to resolve design and construction issues before they become critical delays.

In addition to establishing an early rapport with local authorities, an expert project team also becomes familiar with local geography and environmental issues. Is the project in an arid region, or is it humid? A humid atmosphere may require extra protection of electrical connections to prevent corrosion. Are there significant variances in topography? The team may need to account for these variances in terms of construction equipment access, placement of panel arrays and installation of trackers. If soils are sandy, the EPC provider may direct its subcontractor to use a different method to drive piles to ensure stable foundations. On the other hand, if soils are rocky, the team will need to plan for heavy specialised machinery to drill through rock. Are there any protected species of plant and/or wildlife present in the region? The team will need to develop an environmental plan to ensure compliance with laws and minimise the effect of construction on protected plants and/or wildlife. Does the area regularly experience extreme forms of weather? For example, an area known for its seasonal hail may



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Skilled project management is essential for the smooth construction of utility-scale PV power plants

require extra protection of electrical connections and panels to prevent hailstorm damage.

These early assessments allow the EPC provider to structure an agreement with the owner that adequately accounts for project-specific risks. A project management team involved in the preconstruction process offers additional value to the EPC provider and owner in the team's expertise in the practical construction process. The EPC agreement should reflect these risks, including a structure which the project management team will be expected to follow in the event that risks not contemplated by the parties occur during construction.

Construction: early issue identification and mitigation

Once construction begins, the key to successful project management lies in strong communication and effective implementation of the EPC agreement. Establishing structure within the team with an internal designation of roles and responsibilities allows each person to lead efficient resolution of any issues that arise.

For example, one team member may manage on-site procurement and scheduling, which includes tracking site deliveries and communicating any manufacturing or delivery delays which impact the orderly progress of construction. During the construction of a utility-scale solar project (which may last months or years depending on its size) advancements in panel technology may lead to the need to revise engineering plans to accommodate improved modules. The member managing procurement will assess the implications of the advanced technology on the EPC agreement provisions and specifications. Do the parties need to execute a change order? Is the EPC provider entitled to an extension of time in order to ensure the most advanced panels are installed on the project?

To the extent the new panel production impacts cur-

rent panel supplies, this manager will amend the project schedule, adjusting procurement of related materials and coordinating alternative work schedules with subcontractors. He will mitigate the effect of any schedule disruption by prompt communication to all involved parties. He may develop alternative solutions to meet critical deadlines despite schedule disruption caused by the change in panels.

Another team member may supervise site safety and security, ensuring compliance with all regulations and supervising site activities around energised portions of the plant. Security measures double as loss prevention protection for the EPC provider, as valuable materials and equipment are often stored on-site. Although the entire project team must prioritise safety and security, this team member offers extra support to ensure all subcontractors and personnel on site follow the site safety plan. In addition, this team member assumes the lead in responding to unanticipated issues relating to safety and health.

For example, a regulatory authority may issue an amended rule during the course of construction, requiring all workers to wear additional personal protective gear due to an increased level of air contamination in the region. This project team member will review the site safety and health plan to determine if the existing plan continues to comply with the amended rule. If not, the team member will assess the EPC agreement's allocation of responsibility for amended regulations, and whether the added cost of compliance with the amended rule allows the EPC provider to seek a change in price. The team member must ensure all subcontractors' compliance with the amended rule pursuant to the EPC provider's subcontract agreements. With a skilled project management team, the amended rule is implemented and enforced swiftly on the construction site – preventing potentially catastrophic delays should the

regulatory authority deem the project out of compliance and require the EPC provider to cease all work.

A third team member may be tasked with management of certain subcontractors and scopes of work. For example, a utility-scale solar power project requires significant high voltage and electrical work. This team member may facilitate installation of transformers and inverters, confirming timely delivery, installation and energisation from subcontractors and suppliers.

He may also deal with related issues as they arise during the course of the project. For example, if an electrical subcontractor severs an unmarked underground cable during trenching, resulting in loss of power to site telephone lines, this team member will coordinate resolution of the issue and safe replacement of the cable. The team member becomes the point of contact for briefing the owner on the issue as well as reassuring the owner of the cable's replacement. He also investigates why the drawings did not reflect the cable in an effort to prevent further accidents.

Although designated roles assist in organising the project management team's response to construction issues, each member of an experienced team assumes ultimate responsibility for implementing the EPC agreement and communicating with the owner on behalf of the EPC provider. Similarly, the team understands that a successful project involves constant communication between the EPC provider and subcontractors.

Success by proactive management

The amount of risk involved in a utility-scale solar plant creates formidable construction challenges to navigate. A skilled project management team is essential for EPC providers and owners seeking to negotiate a project to timely completion and successful energisation.

Members of a skilled project management team may have varied backgrounds and experience, but each is devoted to responsibly managing issues that arise during construction. Key to this management is the fundamental understanding of the controlling EPC agreement between the EPC provider and the owner, and prompt implementation of the principles expressed in the agreement to solve problems on site.

By negotiation of pre-construction risk into a formal EPC agreement with the owner, to creatively resolving challenges that arise during the construction process, to preventing the escalation of problems into crises by responsible on-site mitigation, the right project management team completes the formula for successful construction of utility-scale solar projects. ■

About the authors

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