Ground Mounted Power Plant Project Plan and Control

(SA-B-20210827-004)

Nowadays, with the development of the rapid development of large scale ground-mounted power plant, the construction management of the power plant has attract the attention of the practitioners' gradually. Solar Power plant project management is a very comprehensive project management work and involves different stages including design, procurement, construction and trail operation. It covers a wide-range of topics and is multi-professional, which has the characteristic of practical, dynamical, and complicated. It requires the constructional personnel to adjust and optimize the project progress in time and realize coordinate the configuration of progress and resources regarding the scheduled plan, procurement plan and design plan integrated dynamically.

The methodology of project plan and control theory about the ground-mounted power plant construction has been completed and mature gradually due to the years of practical experience of the practitioners. Many plans and control methods has a great effect on the practice in actual project management. The methods and tools of project management and control management, such as Gantt chart (or bar chart), critical path method, program evaluation and review technique, critical about common ground-mounted power plant construction plan.

1.Project Task Breakdown

Project work breakdown structure is to breakdown the work layer by layer to form work of different layers. It a collection of all work activities set to complete project target and display in the form of a diagram. When breaking down the work, it can help project management practitioners to sort the work relationship between overall and graded and practitioners can also understand the content of different layers through project work breakdown as well as guide specific works. The overall description of the project and highlighting key content are also the basis for the production of the project and the breakdown of the work.

Generation Project Description

Project Name	XXX Solar Photovoltatics Project
Project Address	Province A City B Town C Suburb D
Construction Use Area	Total Construction Use Area X m2，Permenant Land Acquisition Area Y m2 Temporary Land Acquisition Area Z m2
Scope of Design	Solar Photovoltatics generation capacity 100MWp, Pad-mounted Substation, Switchyard 35kV, Power Cable, On-site Transportation、Main Transformer、Delivery Station 110kV, Construction auxiliary works
Installation Capacity	100MWp
Major Quantities	Solar photovoltatic generation module XXX pcs, Inverter XX Unit, Power Cable X km, Earthwork, Earthwork backfilling, Concrete, Rebar
Project Objectives	The installation and commissioning of all Equipment of the Solar Power plant completed and all the solar power plant are connected to the grid for generation.
Construction Period	5 Months

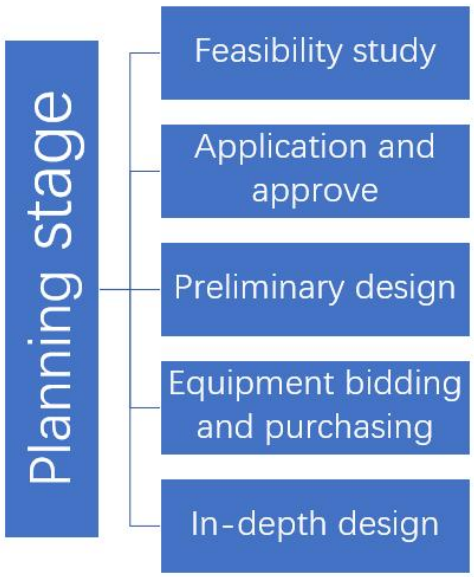
At the same time, the organization structure of the project will be set as the following graph:

Power generation Project Organization Structure

Base on the characteristic of the project, the main task of the project will be breakdown to: planning phase, construction drawing review phase, construction phase, acceptance phase.

2.Planning Phase

Project feasibility study is a decisive work needs professional consulting institution to design and form feasibility study report. Analysing project necessity, feasibility is the important promise of project development, for example, proposal of project site selection, Preliminary review opinions on project land use, description of project land use and geological disaster assessment etc; The preliminary project design mainly includes drawing up dimension, quantity and specification of equipment, confirming installation form, drawing up installing location and quantity etc; The detailed design needs to confirm the construction site conditions, confirming installation location of equipment, selecting electricity distribution room, designing power cable routing, confirming gird connection point and the grounding point of the power station.



Planning Phase task breakdown diagram

Ground Mounted Power Plant Project Plan and Control

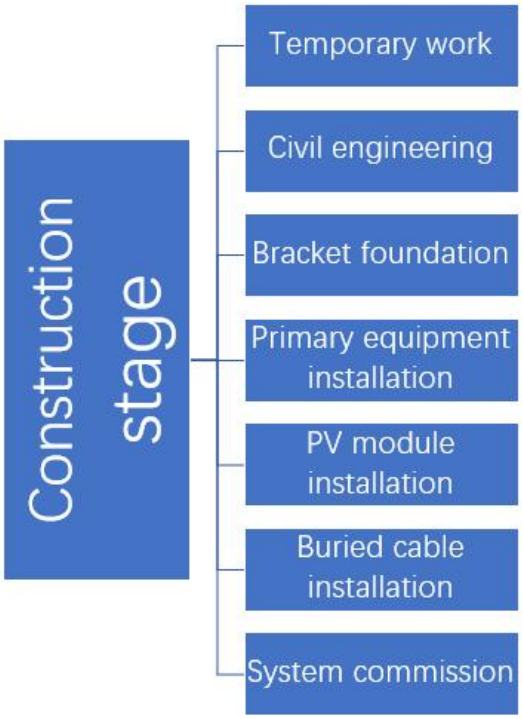
(SA-B-20210827-004)

3.Construction drawing review phase

The main tasks including self-review by the main designer, mutual review within the discipline, drawing proofreading, external review by the drawing review organization and joint review of drawings.

4.Construction phase

Construction phase is the main content of the entire project and also focus of the work. The construction phase can be divided into temporary project, civil construction, bracket foundation, sub-station and inverter bracket, bracket installation, transformer, inverter, switchgear and related power distribution devices, battery assembly installation, line laying and system commissioning.



5.Acceptance phase

Acceptance phase is the final work of the entire construction process. This phase is the key part of comprehensively check construction quality of the project, inspect the project results. The success of acceptance means the project and operate successfully and maximize the investment benefits.

Ground Mounted Power Plant Project Plan and Control

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6.Plan control and implementation guarantee in the project

During the construction of photovoltaic power generation project, when comparing the construction progress, it is necessary to compare the actual progress with the weekly plan progress and the monthly plan progress respectively. In case of deviation from the weekly schedule, the project department can adjust the schedule by itself; In case of deviation from the monthly schedule, the new schedule shall be submitted to the head office and the supervision engineer for approval before implementation.

When the actual progress of the project is inconsistent with the planned progress, especially when the actual progress of the project lags behind the planned progress, it is necessary to carefully explore the deviation and the causes of the deviation, and calculate its impact on the follow-up work of the project, which is comparing the generated deviation with the work free time difference (FF) of the work. If it has an impact on the follow-up work of the project, countermeasures shall be taken to adjust the construction progress and ensure the timely completion of photovoltaic power generation project.

7.Risk analysis and control method

During the implementation of photovoltaic power generation project, there will be various obstacles to the project progress. According to previous project experience and on-site investigation and analysis, there may be factors affecting the planned progress in the aspects of construction organization arrangement, construction efficiency, construction machines and tools, etc. Therefore, to comprehensively analyze the risks of the project, measures will be taken to control them. As the following table shows:

Ground Mounted Power Plant Project Plan and Control

(SA-B-20210827-004)

Plan Risk Analysis and Control Table:

Number	Risk Analysis	Control Measures	Responsible Department/Person
1	The construction plan is unreasonable and the actual progress deviation of the construction period is relatively large.	Prepare a scientific and reasonable general schedule, monthly schedule, and weekly schedule of the construction plan and control it stage by stage, correct the derivation in time.	Project manager, construction manager
2	The ability of managers is not strong and the plan execution is not enough.	Choose staff with strong management ability and technical ability to form the project department and ensure they are on duty.	Project manager
3	Low efficient construction	Carry out labor competition,premote new technology, new craft to improve the labour efficiency and execute the construction progress strictly and use advanced internet technology to control the schedule.	Project manager & construction manager
4	Material and information supply	Purchasing by invitation to bid in time, unified state control dispatch, transport for large facilities. Check quality and quantity in time when goods arrives.	Purchasing Department
5	The construction quality is not up to standard, resulting in rework	Strictly execute regulation and rules as well as SOP, following the ‘quality management system program file’ during the construction process; Make sure the execution of work responsibility to make sure the quality and reduce reworking.	Technical Department Quality and Safety Management Department
6	Design change affect the construction work	Cooperate with supervising engineers and the HQ actively to shorten the examine and review time. Adjust the resource supply plan in time.	Project Manager
7	Construction Tool Problem	Ensure the machines and tools are ready in time and in good condition. Maintenance team and duplicate part are available.	Construction Management Team
8	Fund are not ready in time	Make reasonable plans for fund use and go through the settlement procedures of progress payment as soon as possible.	Project Manager
9	Large temperature difference, bad weather etc results in reduced effective working time.	Arrange reasonable construction plan and add the construction volume in proper weather conditions	Construction Management Department

Ground Mounted Power Plant Project Plan and Control

(SA-B-20210827-004)

In short, by optimizing construction management, taking practical and effective safety measures, quality measures, optimizing construction technology and strengthening construction process management means, we can reduce construction cost and improve project construction level while ensuring construction safety, construction quality and construction progress.