

### Aramco projects create win-win situation for the kingdom and company

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#### Abstract

Working with an extra layer of cooperation, transparency, and collaboration surely pays dividend. According to Steve Jobs, cofounder of Apple Inc., "Great things in business are not done alone. They are done by a team."

Marjan Increment Projects Department (MIPD) integrated with Onshore Maintain Potential Projects Department (OMPPD)'s Defense Support Facilities – Shaybah project (BI 10-15834) to resolve the major delivery challenges for 13.8 kV switchgear materials encountered by the very important and critical project of the Ministry of Defense (MoD). The team worked with contractor/vendor to come up with innovative technical solutions which would minimize the impact – both schedule and cost – on Marjan Offshore Oil Facilities project.

#### Innovative cooperation

OMPPD's Shaybah project for MoD is a highly important project for the safety and security of the Kingdom of Saudi Arabia. The project was experiencing a major delay in the delivery of the critical 13.8 kV switchgear which, if unmitigated, could have delayed its Mechanical Completion Certificate (MCC) and subsequent startup.

Shaybah project reached out to MIPD for a collaborative opportunity to achieve the critical scheduled turnover of the facilities to the security services. The Marjan Increment Project team has then taken this collaboration approach onboard while minimizing any impact to the Marjan Offshore Oil project. In the Company and government's best interest, Marjan and Shaybah projects were successful in eliminating the issues relating to the delay in equipment delivery.



Partial readiness of switchgear for Shaybah/OMPPD project

#### Background

Medium voltage (MV) switchgear supplies power to process and utilities, in addition to providing a high level of safety, so that both operator protection and fault-free equipment operations are assured.

MIPD and OMPPD placed the purchase order with the same approved vendor for 13.8 kV switchgear delivery. However, OMPPD was short of delivery of some critical sub-components for the switchgear; MIPD's materials on the other hand were ready for testing. To achieve the Company's objectives, an effective integrated interface team was established with the Marjan Increment Projects team leading the challenge. The integrated project team worked tirelessly to identify solutions that would benefit both projects and succeed without any impact to their cost and schedule. The delay experienced by the sub-supplier was due to the worldwide shortage of semi-conductors as a result of the CoVID-19 pandemic.

#### The challenge of conceptualizing

MIPD scope consists for design, procurement, fabrication, installation, hook-up and pre-commissioning of Nine (9 ) Oil Wellhead

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Platform SSS design topside facility and Four (4) Oil Tie-in Platforms including Jackets and decks along with associated subsea pipeline and submarine cables.

The sequence of wellhead platform fabrication requires the switchgears be in place prior to the "stacking" of the upper deck which in turn opens significant work fronts at fabrication yard. A number of proposals were made by the Marjan Projects team which included shifting of parts in each cubicule after testing, delaying the installation of future and spare cubicles until installed on the platforms, splitting of shipments, etc.

Exercising collaboration between multiple parties, a plan was formulated and executed. The parties involved included MIPD SAPMT, Saudi Aramco Project Inspection (PID), Shaybah MoD Project SAPMT, Wahah Electircal Supply Company/ Elerical Industries Corporation – KSA and M/s MESA - Spain (old sub-component)



Switchgear readiness for MOfOFD/MIPD project

In-line with Saudi Aramco's objectives to optimize the utilization of resources, Engaged the right stakeholders to understand the current and desired state around capability, costs, schedule and outcomes. The swapping of materials from MIPD to Shaybah MoD project was studied from the perspective of both parties' delivery readiness subsequent to the Factory Acceptance Test (FAT). If the materials were not swapped to Shaybah MoD project, FAT would not be completed within the anticipated time frame, which would eventually lead to the delay of the Shaybah project. And with the transfer, FAT was completed as envisaged by the interface management team.

#### From paper to practice

Marjan Increment Projects team carried out a technical study to check the delivery of various components that were required to meet the Mechanical Completion Certificate (MCC) date for Shaybah MoD project's 13.8 kV switchgear (SWGR).

To resolve the major delivery challenges, the team, in cooperation with OMPPD's, worked with contractor/vendor to come up with innovative technical solutions which would minimize the impact on Marjan Offshore Oil Facilities. OMPPD required the use of six (6) of 20 Current Transformer (CTs) and relays. MIPD SWGR requires five (5) of each per SWGR unit.

#### Solutions included the following:

-The project team accelerated the delivery of at least one (1) OMPPD CT and relay which allowed the completion of three (3) of each MIPD SWGR through its expedited efforts.

-The project team performed multiple FATs by swapping out CTs and relays between units with final installation of the remaining CT and relays to be installed at site, and FATs were conducted.

-With MIPD SWGRs each containing 1 x spare and 1 x future cabinets, the project team used three (3) CTs and relays for each cabinet for a total of 12 of 14 available. The remaining two (2) to be reused to perform FATs, and all SWGR FAT re-conducted at site.

The above solutions required the cooperation of other Aramco organizations including Project inspection (PID),Power System Operation (POD) and Vendor Inspection (VID) to agree on the conditional release note as well as on the partial clearance of Inward Material Clearance (IMIR) and agreement to perform provisional FAT at the vendor's yard and re-conduct the same at the contractor's yard.





The parties decided on the materials to be transferred from MIPD to OMPPD, which allowed the fast-track manufacturing of Shaybah MoD project's 13.8 kV switchgear. The culmination of all the above efforts resulted in the swift delivery of the material to the project site. The swapping of materials was consistent with MIPD's project fabrication yard schedule.

Khalid Z. Al-Sulaim, MIPD director, said, "The team has shown excellence in executing and managing this critical interface with other crucial project during a tight fabrication window schedule along with very limited resources that avoided major schedule and cost implications to both the projects and Company.



MIPD completion of sailaway after switchgear installation

#### Final thought

The collaboration that took place within the Company's organizations and the agreement that was reached by all parties paved the way in the successful execution of both projects.

Khalid M. Al-Muwalid, manager projects of MIPD's Marjan Offshore Oil Facilities Division, said, "The execution of this critical integrated approach and associated technical feasibility was achieved within a short time frame including the extensive interfaces among several stakeholders in different locations/time zones and the utilization of Company resources during its crucial time between projects. The collaboration that took place within the Company's organizations and the agreement that was reached by all parties paved the way in the successful execution of both platform in-to production.

These interfaces were very effective and were the key success of the timely execution of both projects."

MIPD's successful installation and energization of switchgear after the team's collaboration with OMPPD in its defense project



MIPD's successful installation and energization of switchgear after the team's collaboration with OMPPD in its defense project

The collaboration and flexibility exhibited by all involved team members and organizations have significantly enhanced Aramco's growing long term relationship with its customers thereby achieving the envisioned projects' objectives. ###

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