

ENSURING GLOBAL PROJECT COMPETITIVENESS THROUGH
CONSTRUCTION & LOGISTICS EXCELLENCE



ANIMP – ECI International Conference

PLANNING AND EXECUTION OF A MEGA
PROJECT IN TIME AND WITHIN BUDGET:
A CASE STUDY OF UNLOCKING THE
POTENTIAL FROM THE CONTRACTOR AND
CLIENT ACTING AS “ONE TEAM”

**Habshan-5 Process Plant:
“ONE TEAM FOR A GREAT SUCCESS”**

HARMONY. AN INSTRUMENT IN OUR JOB.



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MILAN, ITALY, JUNE 19-20, 2014



4TH ANIMP'S CONSTRUCTION SECTION & ECI 2014 ANNUAL CONFERENCE
with the collaboration of ANIMP's Logistic Section

MAJOR QUANTITIES IN PROCESS PLANT CONSTRUCTION:

Concrete: 270,000 M³

Steel Structure: 72,000 Tons

Equipment Erected: 100,000 Tons

Piping: 65,000 Tons (3.25 Million Inch Dia)

Cables: 7,700 Km

- 4 x SRU Trains
- 2 x Lean AGR
- 2 x Rich AGR
- 2 x TGTU
- 2 x Compression Trains
- 2 x NGL Units
- Sour Water Treatment
- Condensate Recovery
- Flare Unit

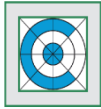


MAJOR QUANTITIES INVOLVED IN THE PROJECT

In correspondence with the size of the Project, the quantities involved were also quite large. Some of the major items are listed below.

- 6 Operating Centers: Yokohama, Milan, Rome, Mumbai, Manila, UAE
- Engineering Man hours: 2.7 million
- Eng. Deliverables: 145,000
- Isometrics: 64,700
- Loop checks: 30,000
- Concrete: 270,000M³
- Steel Structure: 72,000 Tons
- Equipment: 100,000Tons
- Piping: 65,000 Tons
- Welding: 3,200,000 Inch Dia
- Cable Laying: 7,700 KM
- Man Hours Spent: 135,000,000
- Safe Man hours Without LTI:
> 100 Million Man hours





TARGETS ACHIEVED

Several important Mile Stones were achieved in this Project in terms of quantities, Man Hours, Delivery on Time, Safety records and Awards. Some are given below.

HSE - >100 million safe man hours without LTI in construction, a world record in oil and gas projects

QUALITY - All key performance indicators better than indicated values; one of the lowest weld repair ratios in the industry < 1%

SCHEDULE: Monitored On Early Schedule, Completed on Time

PRODUCTION: Production Started as planned at the EPC Contract award in mid 2009 at 43 months from contract signature.

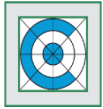
BUDGET: completed within budget both for client and EPC Contractor



FACTORS THAT CONTRIBUTED TO THE SUCCESS

- **HSE - Focus on worker welfare:** Equal dignity to all participants
- **Quality - Faultless Right First Time Start Up:** Do it right the first time
- **Engineering – “Once through Engineering”:** Endorsement of the FEED at bid stage and implementation of lessons learnt from all Stake Holders
- **Project planning:** Early award of LLI / Subcontract / monitoring on early curve
- **Cold Eye Review:** Periodic Cold Eye Review by expert teams
- **Synergy:** Common Procurement Strategy and Control by JV
- **Successful & timely transportation of oversized equipment**
- **Early erection of critical equipment.**
- **Healthy Competition:** Competition and Support by each JV Partners
- **Proactive Client:** full support from GASCO that was acting as one team with Contractor.
- **The Prime Movers – one team concept – empowering the workers to participate in the decision making process unlocking the potential from each of them**

WE MADE PASSION OUR RAW MATERIAL.



HSE – A WAY OF LIFE

Proudest moment came when the Project crossed **100 Million safe man hours without LTI**. This could not have been possible without the dedicated efforts from a determined team.

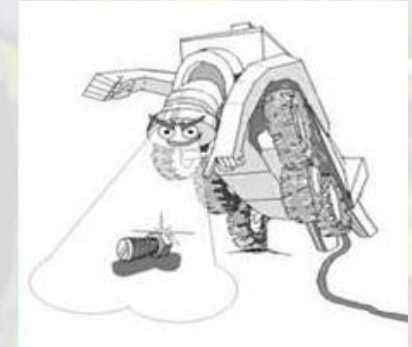
- Safety promoted as a culture by rewarding good safety behavior and was no longer an imposition but a part of life.
- “No Name, No Blame” culture encouraged so that all unsafe practices and near misses are reported.
- We propagated the concept the “equal dignity for all” from Management to Workers.
- Management led by Example: GASCO, Contractor & Subcontractor Management team participated in the STARRT (Safety Task Analysis Risk Reduction Talk) meetings together with workers every day.
- Implemented “Incident Injury Free program (IIF)” through a consultant which organized alignment sessions between various teams
- **Two way dialogue between management & workers including GASCO, Contractor and Subcontractors to address workers’ welfare issues**

YOUR FAMILY IS WAITING - RETURN SAFELY TO YOUR FAMILY

QUALITY: FRFTSU - FAULTLESS RIGHT FIRST TIME START UP

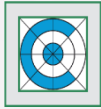
Being a Sour Gas Treatment Plant, NGL Processing and world's largest Sulphur Recovery Units, there was a conscious effort to have the highest quality standards during all phases of the Project.

- JGC-Tecnimont Joint Venture followed the **"FAULTLESS RIGHT FIRST TIME START UP"** Philosophy of GASCO towards this goal.
- Emphasis was on "clean erection" and the pipes were inspected using "Mogrinko" – robotic cameras prior to closure of loops. This allowed in trouble free commissioning and startup.
- Participation of all personnel to the "clean erection" campaign with direct involvement at all levels.



IT'S EVERYBODY DUTY TO KEEP ALL PIPES CLEAN

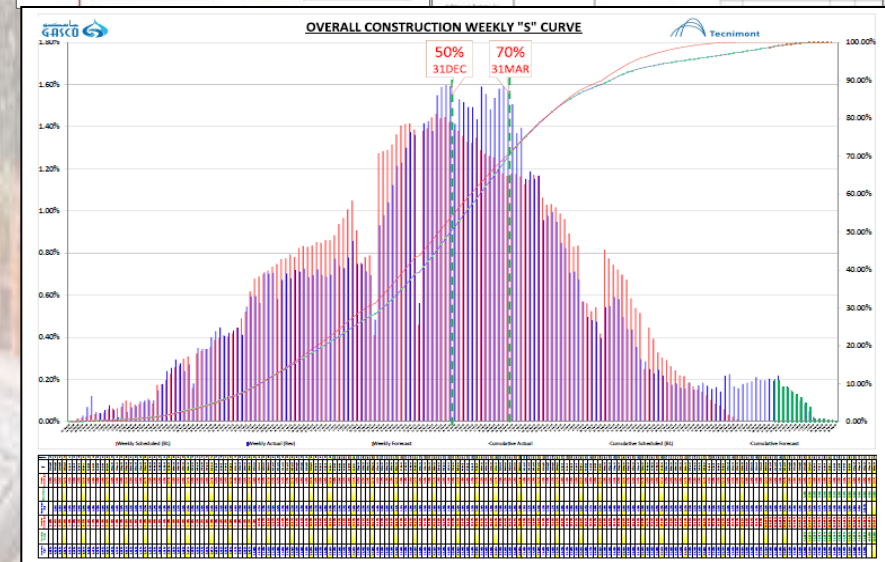
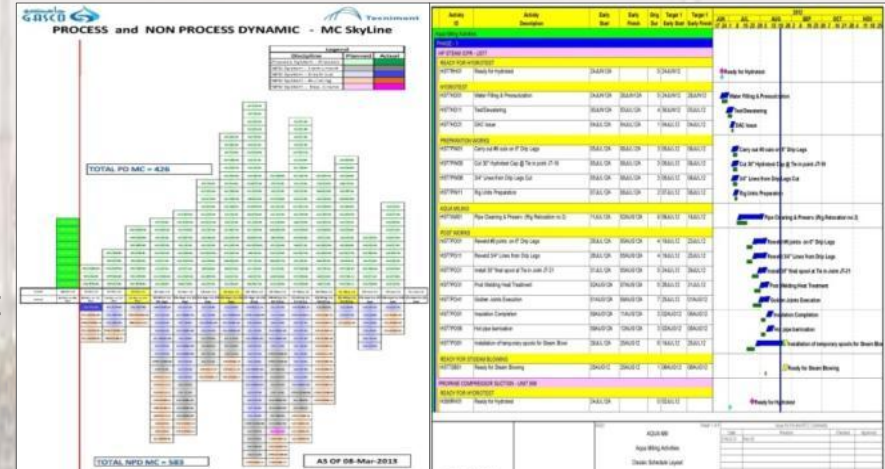
FRFTSU Banner and poster campaign at site and office

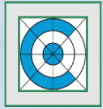


PROJECT PLANNING

The key to success in any mega project lies in the amount of preparation work and the accuracy of detailed planning that goes into the Project.

- JGC – Tecnimont JV put their best resources into Project Management, Engineering, Procurement and Project Control to accurately prepare and monitor the Project.
- Almost 4 years of work involving 4,000 engineers, 25,000 workers, 130 million man hours later, the plant started trial production in March 2013, exactly as planned 4 years earlier in 2009.
- Also in this case the people were continuously informed about the progress and targets through many ceremonies involving all personnel at site and by frequent contact of management with workers.





COLD EYE REVIEW – THE HEALTH CHECK

JV deputed task forces comprising of experts selected from both JV partners from outside the Project to review the status of the project on frequent intervals.

- Such committees conducted a thorough health check of the Project, going into every aspect of the Project.
- These cold eye reviews proved to be of great benefit to the Project in identifying potential problems ahead of time and allowing the JV to take preventive measures.
- The presence of very experienced people from outside the project opened new ideas to the managers involved in the day to day operations and positive scenarios that were not foreseen earlier.



TRANSPORTATION OF OVERSIZED EQUIPMENT

JGC-Tecnimont JV dispatched sufficient experienced inspectors in the manufacturing facilities to monitor critical equipment. A major challenge was the transportation of the super heavy equipment, especially within UAE.

- JV had to manufacture special temporary steel bridges over the culverts on the national highway E11 so as to transport such critical equipment.
- Due to the complete support of GASCO and by giving utmost attention to details, the JV was able to succeed in this challenging mission along with its Subcontractors.
- People of specialized companies like heavy lift and heavy transport merged their experiences with the site management to find all the best and efficient solutions.



ERECTION OF CRITICAL EQUIPMENT

Another major challenge was the erection of the super heavy/oversized equipment.

- The heaviest equipment was weighing around 1,650tons and the highest column was 105 meters tall requiring special gantry lift.
- Two of the reaction furnace had to be erected using SPMT (self-propelled modular transporter).
- The 32 supercritical lifts and the more than 200 heavy lifts were all performed successfully and in time.
- All this job could not have been achieved without the professional care taken by the team of JV and the Subcontractors and also to the careful planning.

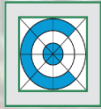


PROACTIVE CLIENT

GASCO was there whenever the Project needed their support. This very sentence is enough to testify the active role played by GASCO in supporting the Project in every which way it can.

- Whether it is to get approvals from local authorities, or to support workers welfare initiatives or for community support or whatever that helps the Project, GASCO was always there to support the JV and the team.
- **GASCO was very supportive in providing lessons learnt from other Projects, approving time and cost saving solutions and speed tracking any other proactive decisions that benefits the Project.**





HEALTHY COMPETITION

- The Project was Vertically split among the JV partners in geographical areas. This allowed the JV partners who were in their own right major EPC Contractors to have a healthy competition and to support each other at the same time.
- There were also opportunities to learn from mistakes of each other and adapt from the better practices of one another.
- The Project Management Board consisting of senior members from both partners controlled the operations of both operating centers and ensured that the competition stayed healthy and the best practices were shared timely for the benefit of the Project.



THE PRIME MOVER

- All said and done, the success of any Project, big or small, depends on the Prime Movers, the people who actually sweats it out there to deliver those dia-inches, those cubic meters, those loop checks.
- The success of this mega project is the biggest tribute to the working man in any part of the world with 100 million safe man hours spent on it.
- It is the biggest tribute to the team work, the shining example of what we can bring out with a daily care for the people and enthusiastic leadership.
- With GASCO full involvement, JGC – Tecnimont JV led a massive Incident Injury Free Campaign along with all Subcontractors, which aimed at treating everyone involved in Habshan 5 Project with equal dignity – be it client/contractor/subcontractor/worker/ engineer/manger – and encouraged two way communication at all levels.

THE PRIME MOVER (cont'd)

- We encouraged full participation of all people to the execution of the project, feeling active part in the day by day improvement of construction process in terms of safety, quality and efficiency, allowing them to offer their own contribution to the success of the project.
- This goal were achieved by periodic get-togethers, frequent management site visits, workshops, interactive trainings and numerous social initiatives which generated a feeling of belonging to a great team; which scope was to build one of the most impressive plants ever built in this industry.
- **This is how Habshan 5 Mega Project was for all a great opportunity to unlock the potential that was inside each of us, being proud to have been part of this exceptional experience.**



Together with our Client, GASCO, we crowned the huge effort with the prestigious award of the "Best Oil & Gas Project" in ADIPEC 2013

IGD Habshan 5 Project Winner of the "Best Oil & Gas Project" Award at ADIPEC 2013

Congratulations to 2013 ADIPEC Awards Winners

CATEGORY 1

Award: Best Gas & Oil Project

Presented by: Mr. Toshiaki Kitamura, President & CEO of INPEX CORPORATION

Winner: Integrated Gas Development Project by GASCO (ADMA-OPCO & ADGAS)



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