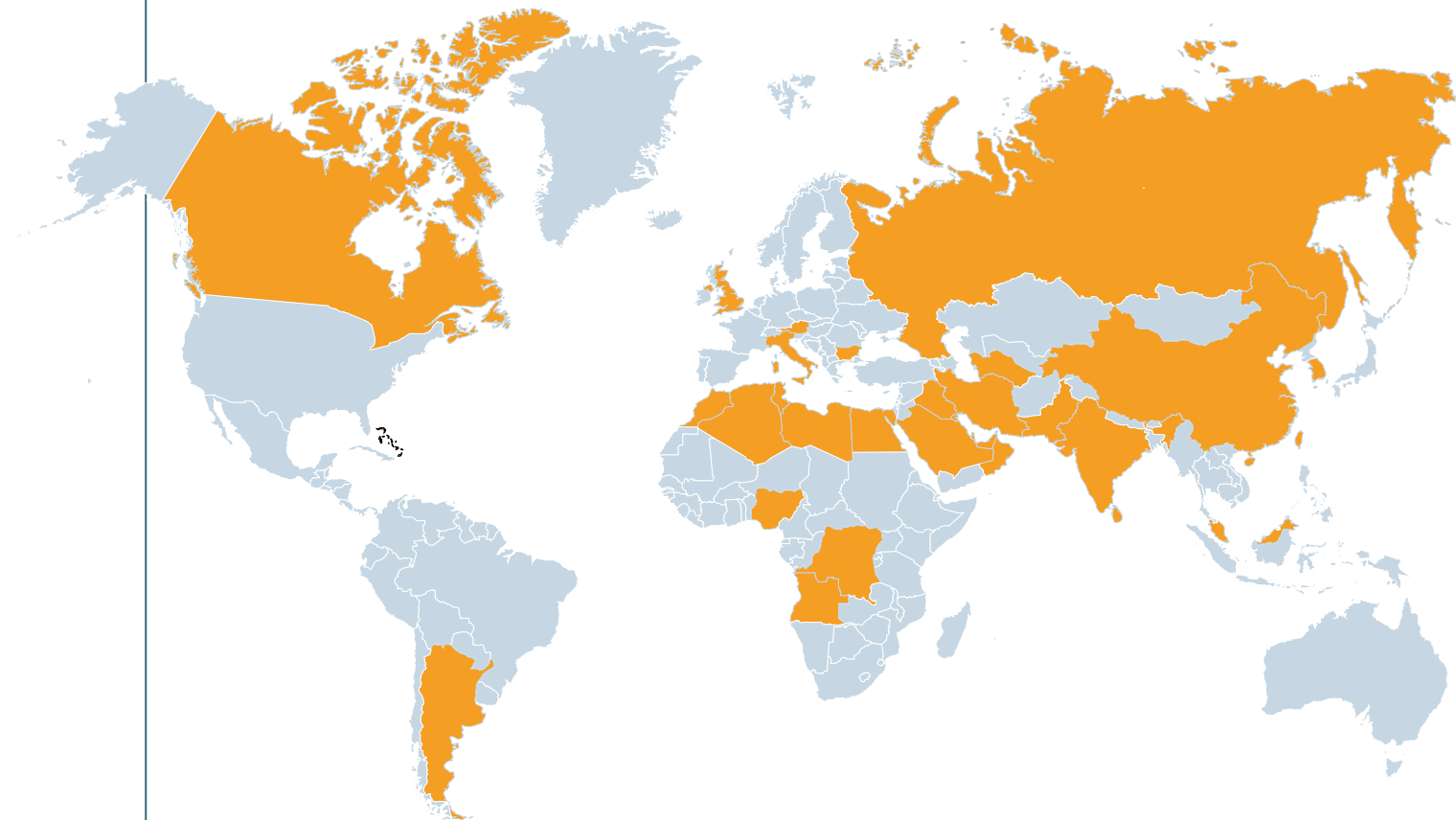




# **SAIPEM** **OIL AND GAS** **PRODUCTION** **AND PROCESSING**



# SAIPEM'S EXPERIENCE



EXPERIENCE

**60** YEARS

**6** M+

SBPD OF OIL

OPERATING IN

**30** COUNTRIES

**40** B+

SCFD OF GAS

MORE THAN

**130** PROJECTS

**15,000** +

TPD OF SULPHUR

# SAIPEM'S CAPABILITIES

WE COVER EVERY ASPECT OF OIL AND GAS PROCESSING



THROUGH THE ENTIRE PROJECT LIFECYCLE



# TECHNOLOGICAL SKILLS AN OVERVIEW



## **LICENSED TECHNOLOGIES ACCESS**

We have access to best- in class licensed technologies and constantly monitor trends to identify the latest developments in emerging technologies.



## **REFERENCE PROJECT DATA REPOSITORY**

Project data repository provides a common and fully integrated platform to allow quick access to stored reference project data and documentation.



## **DYNAMIC PROCESS SIMULATION EXPERTISE**

Commercially available process simulation tools are applied to analyse transient plant behaviours e.g. dynamic model to support safety analyses, design and operation of compressor systems, tuning and optimisation of plant operating parameters, hot air recirculation studies, surge analysis.



## **TECHNOLOGY PARTNERSHIP AND ALLIANCES**

Cooperation with "Milan's Politecnico University" to promote open innovation. Technical support and software use agreements with Technology Providers.



## **LESSON LEARNED MANAGEMENT**

Lessons learned from projects are continuously collected through an effective validation programme and stored within our Knowledge Management Tool available to all to everyone in the Saipem group for implementation.



## **DIGITAL TRANSFORMATION**

With our commitment to innovation, we have successfully embraced digital transformation to support a data-centric approach. A digital suite has been developed to standardise and centralise project data management from project start up to Client handover.

# TECHNOLOGICAL SKILLS FOCUS ON SWEETENING TECHNOLOGY

We have extensive and solid experience in sweetening technology to select and design the most effective solution tailored to specific project needs and integrated with all our processing facilities.

Our experience covers all the key aspects of sweetening design:

- ➔ **IN-DEPTH KNOWLEDGE OF THE SWEETENING TECHNOLOGIES AVAILABLE ON THE MARKET**
- ➔ **PROVEN ABILITY TO LIAISE WITH THE LICENSORS AND DESIGN PROPRIETARY AND OPEN ART UNITS**
- ➔ **EXTENSIVE BACKGROUND, KNOWLEDGE AND EXPERIENCE WITH COMMISSIONING, START UP AND OPERATION ISSUES**





# CHALLENGING FEEDSTOCK

## SHAH GAS DEVELOPMENT PROJECT (SGP) - UAE



→ **ULTRA-SOUR GAS AT HIGH PRESSURE: 23% MOL H<sub>2</sub>S AT 70 BAR**

→ **LARGEST SULPHUR RECOVERY IN THE WORLD: 10,000 TPD OF SULPHUR**

Field location: **UAE**

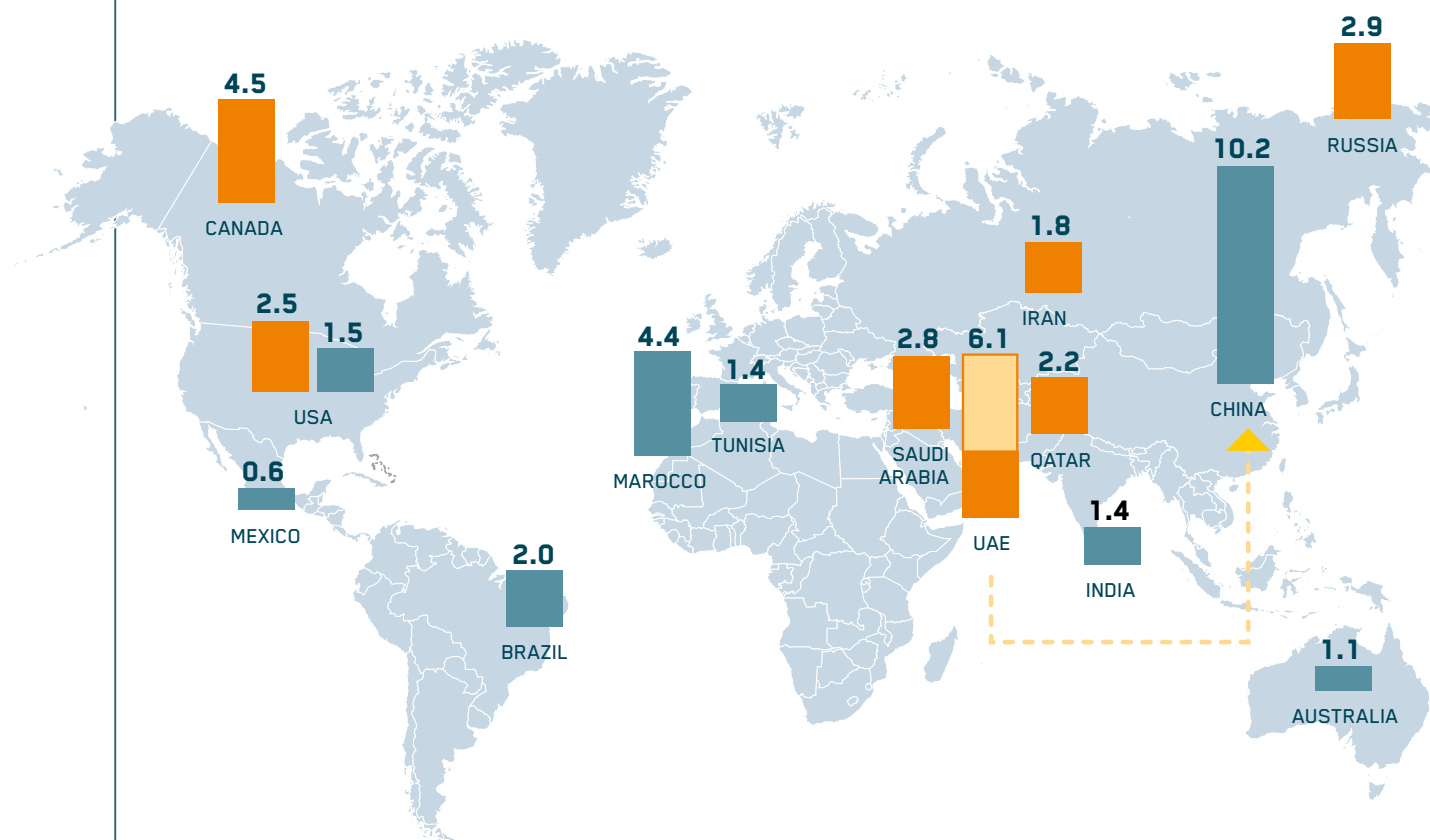
**We leveraged our expertise in Sulphur Recovery Unit design, combined with our consolidated experience in EPC projects, to manage the complexity of Sulphur Recovery Unit huge capacity.**

Safety risks have been mitigated by implementing a restricted zone in the plant layout, called the "Red Zone", to segregate ultra-sour gas at high pressure area.

Saipem applies an integrated approach between construction and commissioning activities to fast track the project. The simultaneous operation between construction and commissioning activities has been managed through a careful identification of the concerned SIMOPS, an assessment of the associated risks and the development of suitable mitigation measures.



## SULPHUR MARKET PRE & POST SHAH GAS DEVELOPMENT - 2015



Million tonnes/year

■ IMPORT

■ EXPORT

■ SHAH GAS PLANT PRODUCTION

# CHALLENGING LOCATION

## SOUTHERN SWAMP ASSOCIATED GAS SOLUTION (SSAGS) - NIGERIA



→ **LOGISTICS: 4 WORK SITES IN REMOTE AREAS (SWAMP) AND 11 IMPACTED COMMUNITIES**

→ **VERY HIGH LOCAL CONTENT: MIN 90% (MHRs) AS PER GOVERNMENT LAW**

Field location: **Nigeria**

**Saipem has been working in Nigeria for over 50 years and has invested extensively in developing local technological and managerial expertise through training and employment programmes aimed at sharing know-how and transferring skills and methodologies.**

In addition, more than 2,000 Nigerian companies are qualified as "active" vendors in the Saipem Vendor database.

Thanks to this long-term strategy and leveraging also on the ability to manage complex stakeholders, Saipem has been able to successfully execute the SSAGS Project, performing the engineering activities at the Saipem Contracting Nigeria Center in Port Harcourt and performing procurement activities in compliance with the local content requirement.

Our Yard located in Port Harcourt has been utilized for the fabrication of six modules and for the pre-fabrication of 50% of the overall sites piping. As a result the works on site were optimized in terms of safety and schedule performances. development of suitable mitigation measures.





# CHALLENGING SCHEDULE

## ZOHR DEVELOPMENT PROJECT - EGYPT



→ **FAST TRACK PROJECT: LESS THAN 30 MONTHS FROM FIELD DISCOVERY TO PRODUCTION**

→ **PARALLEL APPROACH: EXPLORATION PHASE COMBINED WITH ENGINEERING DESIGN PHASE**

Field location: **Egypt**

**Alongside the Final Client from the start, Saipem selected the project technologies in a short time and developed a robust design to accommodate feedstock uncertainty.**

Thanks to our strong commitment to preparing material requisition and completing technical bid evaluations in record time, Long Lead Items purchase orders were placed within eight months of the start of design activities.

Vendor Package Plant (VPP) approach was successfully applied and a “replication concept” was maximised requesting the Vendors to leverage the reference project design in order to squeeze the delivery time.



# THE CHALLENGES OF MULTIPLE CONTRACTS

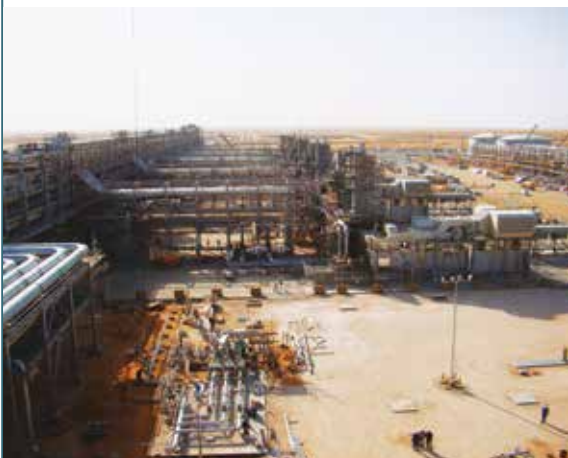
## KHURAIS FIELD DEVELOPMENT - SAUDI ARABIA



### → AWARD OF 4 EPC LSTK CONTRACTS:

- KCC – Khurais Crude Facilities
- KUC – Khurais Water Injection Facilities and Utilities
- WIPS – Khurais Water Injection Plants
- QSTP- Qurayya Sea Water Treatment Plant Facilities

## SHAH GAS DEVELOPMENT PROJECT (SGP) - UAE



### → AWARD OF 3 EPC LSTK CONTRACTS:

- EPC Package 2 – Shah Process Plant
- EPC Package 3 – Shah Sulphur Recovery Units
- EPC Package 5 – Shah Product Pipelines

Thanks to our consolidated methodology, the risks and opportunities from our extended involvement were identified early on and successfully managed promoting an integrated vision of the individual aspects of each project.

The disruptions caused by different project maturities and different stakeholders were minimized through effective and efficient communication, both internal and external.

We exploited all the applicable positive synergies such as design standardisation, enquiry strategies and common site activities.

# THE CHALLENGES OF BROWNFIELD PROJECTS

## KHURAI AREA FACILITIES EXPANSION AND SATELLITE GOSP – SAUDI ARABIA



➔ OVER 900 TIE-INS

## HAWIYAH GAS PLANT EXPANSION – SAUDI ARABIA



➔ OVER 2000 TIE-INS

Having worked on brownfield projects over the last few years we know from experience the various challenges they present. As a result we have put in place effective measures to overcome them.

Specific procedures have been developed and are improved on a continuous basis by implementing the findings from new projects. Project tasks relevant to Brownfields are now managed as a subproject: interface managers and specialists from different areas (engineering , procurement, commissioning , HSE and construction) are appointed at the start of activities and work throughout the entire project to meet the specific needs of brownfields.

Early analysis is carried out to identify any critical tie-ins, whether they be piping and electrical/ instrumentation, which require production shutdown and, once identified, all the required activities are planned and integrated within the overall schedule to be monitored. Our goal is to capitalise on the planned plant turnaround and to minimise the shutdown windows and the consequent loss of production. When concurrence with plant operation cannot be avoided, SIMOPS de-risking analysis is carried out for related construction works.



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**LET'S KEEP IN TOUCH**

