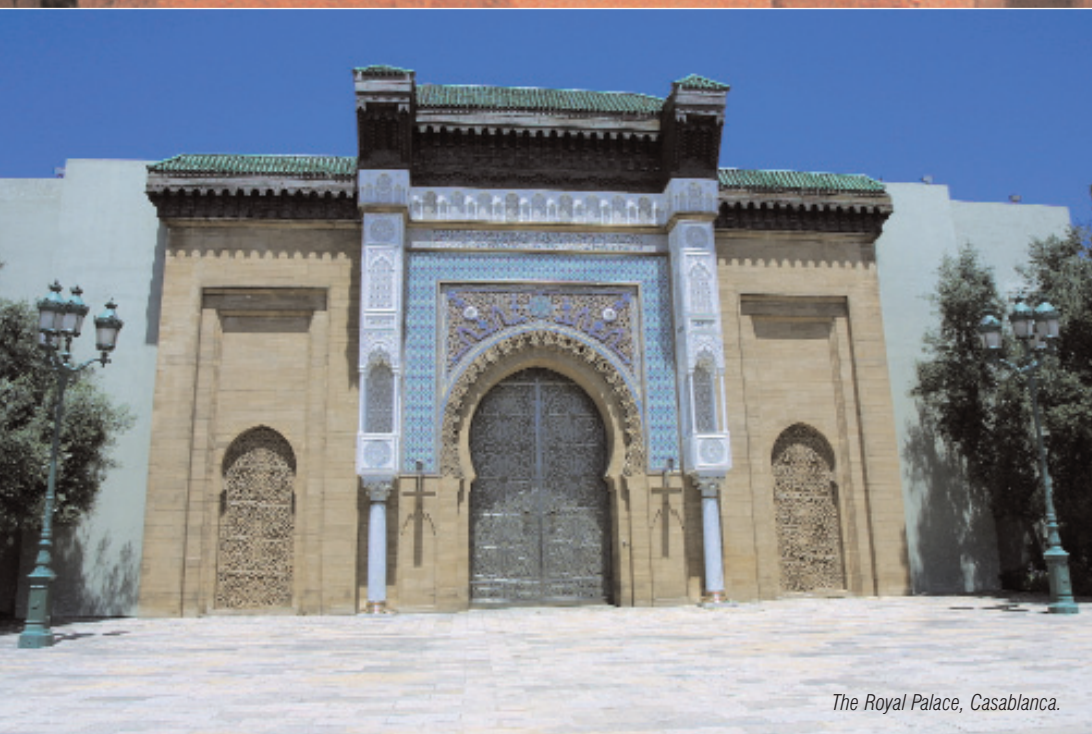


# SAMIR Refinery Upgrade

A major development for Morocco

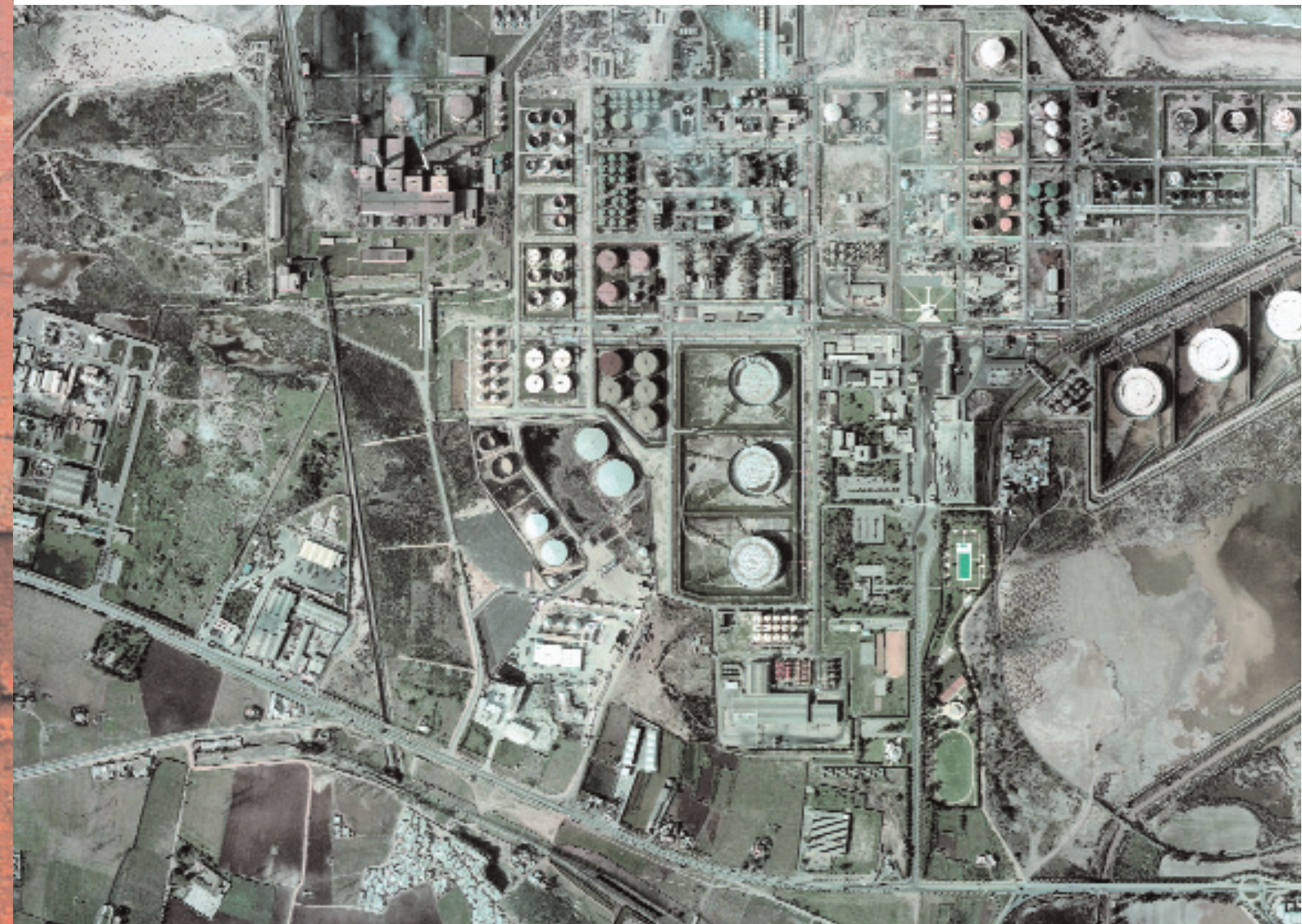


The Royal Palace, Casablanca.

**Foster Wheeler has completed the front end engineering design (FEED) for a major expansion of Société Anonyme Marocaine De l'Industrie Du Raffinage's (SAMIR) refinery in Mohammédia, on Morocco's Atlantic coast, about 30 kms north of Casablanca. The work forms part of Foster Wheeler's overall project management consultancy contract, leading to completion and beneficial operation of the facility mid 2005.**



Jamal Ba Amer, assistant general manager & upgrade project director, SAMIR.



Aerial view of SAMIR's Mohammédia Refinery.

SAMIR is one of the largest companies operating in Morocco and owns the only oil refinery facilities in Morocco supplying to the domestic market. Formerly a state-run company, SAMIR was privatised in 1997, at which time a major shareholding was taken by CORRAL Holding, who also has refining interests in Sweden.

SAMIR has operated a topping refinery (a refinery which does not have residue upgrading capability) at this site since the first crude unit was installed in

1959. Since then, two more crude units, a vacuum unit and a lubes train have been installed to bring the refinery up to its current 6.25 million tonnes per annum (mtpa) crude capacity, sufficient to fully satisfy the Moroccan market with LPG, motor fuels and fuel oil.

The new project increases capacity to 8.25 mtpa and installs conversion units to deliver a higher-value product slate, in line with Morocco's changing market demand. By maximising diesel production

and minimising production of fuel oil, the project aims to maintain SAMIR's dominant position in the Moroccan market up to the year 2010 and beyond.

This \$700m development is at the heart of SAMIR's strategy to evolve into a world-class competitive force in the refining industry. With a liberalising government and changing domestic business climate, SAMIR finds itself competing on the world market as import tariff barriers are removed and domestic price controls are lifted.

Foster Wheeler undertook a feasibility study to establish a refinery configuration that yields a sound return on investment. A full analysis was completed, using a linear programming model which took account of predicted market prices and demands. Ultimately, the configuration was confirmed, which includes a full conversion hydrocracker and a visbreaker unit, supported by a diesel hydrotreater, crude and vacuum unit, plus a hydrogen plant, sulphur unit, amine unit, offsites and utilities.



SAMIR's existing refinery at Mohammédia.



SAMIR's existing refinery at Mohammédia.



The Foster Wheeler team. Left to right: Rowland Davies, construction manager; Richard Bramwell, project manager; Liam Cummins, procurement manager; Allan Roberts, project engineering manager; Paul Kurowski, commercial manager; Nigel Unsworth, process manager; George Symington, quality manager. Pictured above: Irene Stevens, project control manager.

Foster Wheeler evaluated licensor technologies, taking into account yields, capital costs, operating costs and reliability over the life of the plant, and agreed the selection with SAMIR. Chevron Lummus Global was chosen for the hydrocracker, with UOP for the hydrotreater, Shell for the visbreaker and Parsons for the sulphur unit.

Foster Wheeler managed these licensors' preparation of basic design packages and undertook the basic design of all the 'open art' units, offsites and utilities. A full technical specification and detailed plans for integration of these new units into the existing refinery supported these packages. The technical specifications and packages were then incorporated into an invitation to bid package to solicit lump sum engineering, procurement and construction (EPC) tenders from potential contractors.

Our role includes technical and commercial evaluation of bids, preparation of the contract and

associated project specification to contract award, and subsequent management of the EPC contractor through to final performance tests and completion.

We have worked closely with SAMIR's financial advisor to structure a funding plan for the project and prepare briefing documents for export credit agencies and syndicate banks to provide the funds to finance the project.

A local environmental consultant has also been engaged and managed by Foster Wheeler to prepare the environmental impact assessment for submission to

the Moroccan Government and funding institutions.

The project will have a major impact within Morocco. Not only does the design comply with World Health Organisation Environmental Guidelines, it also significantly improves the quality of the motor diesel, the main transportation fuel, providing 50 ppm sulphur diesel for the Moroccan market. This will contribute towards cleaner air in Morocco's cities.

### Morocco facts and figures

- The Kingdom of Morocco is the most westerly of the North African countries known as the Maghreb.
- It is strategically situated with both Atlantic and Mediterranean coastlines.
- Morocco is slightly larger than California in area and its population now exceeds 30 million.
- King Mohammed VI ascended the throne in 1999. He recently married 24-year-old computer engineer, Salma Bennani. In a break with tradition that is seen as a step towards modernising the country, this is the first time in Morocco that a royal wedding has been publicised, with the bride named and her photographs appearing in the media.
- The local currency is the dirham.
- Rabat, the capital, is Morocco's political and administrative centre.
- Casablanca, the second largest city in Africa, with a population over three million, is Morocco's largest city and business centre.
- The Hassan II Mosque, built for the 60th birthday of former Moroccan King Hassan II, is the largest religious monument in the world after Mecca. It has space for 25,000 worshippers inside and another 80,000 outside. The 210-metre minaret is the tallest in the world.