

## **Manderstam International Group Experience in Refineries**

Manderstam International Group has extensive global experience in Petroleum refining, including crude oil evaluation, distillation, high vacuum distillation; processing long residues to catalytic cracker feed and bitumens. Bitumens - straight run, blown, semi-blown, cut-backs. Development work on storage of bitumen, including blockage, bagging, coating. Revamping of straight-run vacuum plants; conversion of straight-run plant to blowing plant. Treatment of effluents from vacuum systems and blowing units. Lubricating oil plants including solvent extraction and dewaxing. Production of refined wax. Fuel oil blending.

### **Global Benchmarking**

Manderstam carries out global benchmarking studies in oil and gas processing plants, marine terminals, offshore platforms, pipelines, refineries, and petrochemical complexes. MIGL holds a global database of cost and operating parameters and performance

**Clients: BP Amoco, Mobil, Arco, Phillips, Agip, Conoco, Statoil, Norsk Hydro, Dong, William's Field Services, BHP, British Gas, Shell, Total, NAM (Holland).**

Since 1995, Manderstam have undertaken annual benchmarking studies of oil and gas plants (76 plants worldwide) providing analysis of unit costs and working practices including mechanical condition surveys and efficiency assessments. This has enabled Manderstam to have an unrivalled overview of global oil and gas processing, design and operating practices and costs.

### **Client:-Pemex, Mexico**

In 2003, Manderstam surveyed and benchmarked 72 installations in Mexico on behalf of the state oil company, Pemex. The work included offshore platforms, marine terminals, oil and gas processing plants, 7 major refineries (5% of global refining capacity) and various petrochemical complexes.

### **Client:-BP, Azerbaijan**

In 2003, Manderstam undertook a review of future operating costs for the expansion of BP assets over nine-year period in the Azerbaijan onshore processing terminal expansion project.

### **Specific Refinery Projects**

#### **NSRP new refinery in Vietnam**

Review of variation claims on behalf of the JGCS Consortium, in respect to the NSRP new refinery in Vietnam, requiring review of preferential design development comments in regard to HAZOP studies and 3-D models.

### **Shell Stanlow Refinery UK**

Maintenance operations in FCC reactor whilst unloading the refractory

### **LPG/NGL gas refinery in Iran**

Reviewed design of LPG/NGL gas refinery in Iran and gave advice on process operating scenarios. Confidential Client

### **Cyprus Refinery Ltd, Larnaca Cyprus.**

Manderstam sent a survey team to review the technical and financial performance of the Cyprus Refinery Ltd on behalf of a potential purchaser who is importing diesel into Iraq and now wishes to consider purchasing the existing refinery (which is closing at the end of April 2004) and dismantling it, transporting and rebuilding it in Iraq.

### **Exxon Mobil, Fawley, UK**

Carried out a hazard and operability study on behalf of Exxon followed by seconding a team of engineers to the refinery for six months to implement the recommendations.

**Monrovia, Liberia-** carried out for technical audits of refinery;

**Mombasa, Kenya-**carried out technical audits on behalf of a potential purchaser.

### **Pertamina, Indonesia**

Plaju-carried out an optimisation study on behalf of Pertamina, following the purchase from Shell of the refinery.

Pelembang-carried out a technical evaluation of the Stanvac refinery on behalf of Pertamina.

Balik Papan-carried out an optimisation study on behalf of Pertamina following purchase from Shell .

Wonokronjo-carried out a technical evaluation of the refinery on behalf of Pertamina.

**Nieuport, and Vietnam-**carried out an evaluation of feed stocks for potential petrochemical plant customer.

**Assab, Ethiopia (now Eritrea)-**carried out an evaluation for privatisation. Further work included studies for redesign relocation of refinery.

**Port Sudan-**technical and financial evaluation of refinery for potential purchaser.

### **Design studies**

Carried out design studies for refineries in Greece, Libya, Ireland, Jamaica, Trinidad, Nicaragua, Indonesia, Canada, Saudi Arabia.

## **Expert Witness Work**

Manderstam International Group are approved expert witnesses by the UK Law Society and have undertaken the following projects in relation to disputes at oil refineries.

- Prepared expert reports in defence of the HSE prosecution relating to the failure of the overflow protection system and its alleged causation of the overtopping of storage tanks and subsequent explosion at the Buncefield oil storage depot in December 2005. This followed the successful civil defence in 2008 (see below).
- Provided expert report on oil storage overflow protection systems design and construction in respect to the civil litigation following the major explosion at the Buncefield Oil Depot.
- Provided expert advice on fuel contamination on fuel supplied by the major supermarkets.
- Provided expert advice on petroleum storage and filling facilities at an automobile production factory following a major fire.
- Prepared expert report on petroleum, diesel and heavy fuel oil distribution and cost structures and refining margins in Ukraine.
- Undertook site survey and prepared expert report on a petroleum filling station and underground storage facilities in respect to criminal investigation of petroleum product substitution by Avgas and VAT fraud.
- Prepared an expert report and **gave evidence** on project management issues (contract execution, cost estimation and scheduling) on behalf of I. S. A. B. (Italy) in the International Court of Arbitration. This was in defense of a \$200 million claim brought by Foster Wheeler and Snamprogetti regarding the design, construction and commissioning of an integrated gas combined cycle power plant using heavy ends from the refinery in Sicily. (Instructing solicitors Clifford Chance, Paris).
- Prepared an expert report on the global market and technical requirements for the manufacture of tetraethyl lead (TEL) fuel additive including a review of global refining capacity/technology investigating the rate of displacement of the purchase of TEL by refineries.. (Confidential)
- Prepared expert report for Total Oil in their successful defense of £4.5M claim by BP over mechanical failure of a turbo expander machine (Denton Hall, London instructing solicitors).
- Prepared evidence for ARCO (Atlantic Richfield) in defense of failure of mechanical equipment at an oil refinery. (McKenna & Co, London instructing solicitors).

- Prepared Expert Report for Wimpey, as Contractor, in their successful defense of a £6M claim by Texaco, the Owner, relating to design of pressure vessels and mechanical failure of a vacuum loading system for diesel desulphurisation at the Texaco Pembroke oil refinery. (Reynolds, Porter Chamberlain, London instructing solicitors).