

The Mott MacDonald Group is a management, engineering and development consultancy serving the public and private sectors world-wide.



## Pharmaceuticals and Biotechnology

Mott MacDonald's US\$1.5 billion business spans 120 countries with 14 000 staff working in all sectors from transport, energy, buildings, water and the environment to health and industry and communication.

As a firm, we are highly respected for delivering comprehensive project management capabilities within a diverse range of services in numerous industries around the globe. For over a century, our skills have been instrumental in creating and managing solutions that can improve the economics, schedule and quality of projects. We provide a full suite of management and professional services to our clients through the entire development cycle of their projects, from initial economic and feasibility studies through engineering, construction, commissioning and start up.





*Sterilisation extraction systems and process water cooling for injection moulds were among the highly specialist building services we designed for Adnip's Abu Dhabi facility manufacturing disposable syringes and IV sets. Our multi-disciplinary role also involved feasibility studies, structural design and site supervision.*



*Mott MacDonald has considerable background and experience in planning, design and construction of clean room environments for the pharmaceutical, biotechnology and food processing industries. For clean room applications, experience ranges from solid dosage forms, aseptic and filling, effervescent and hygroscopic products, contained operations, bulk processing, and biological processes.*

## **Our services**

### **Business advisory**

- Acquisitions and disinvestment
- Business case and location studies
- Financial feasibility studies
- Inward investment advice
- Market evaluation and demand modelling

### **Facility planning**

- EIA and planning services
- Feasibility and concept design
- Geotechnical and contamination surveys
- Statutory approvals assistance
- Surveys and site appraisals

### **Facility construction**

- Architecture and landscape design
- Civil and structural engineering and foundations
- Construction supervision and management
- Design planning and co-ordination
- Electrical and instrumentation
- Front-end design and basic engineering
- Inspection and expediting services
- Mechanical and piping engineering
- Plant layout and craneage
- Process engineering
- Procurement including EPCM
- Safety audits, testing and commissioning

### **Due diligence services**

- Asset and business valuation
- Environmental audits
- Owners' and lenders' engineer
- Solid waste management
- Technical due diligence and expert witness

### **Project management**

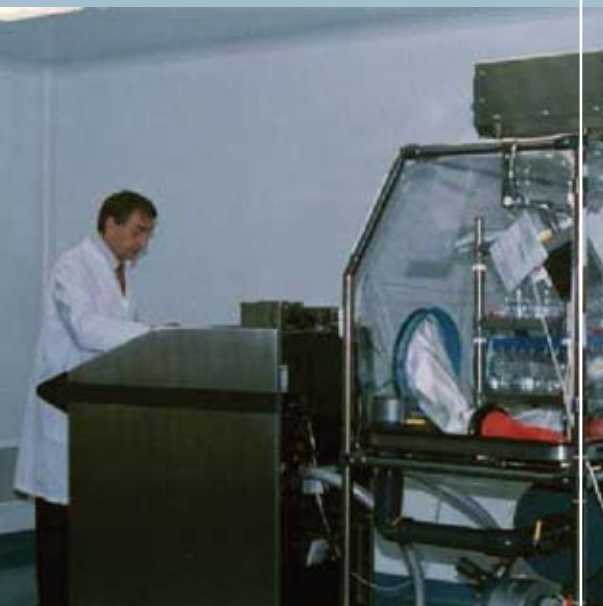
- Contract administration
- Cost estimation and control
- Planning and scheduling
- Plant de-bottlenecking
- Programme management
- Supply chain logistics
- Tender documents and negotiation

### **Engineering and environmental**

- Building management systems
- Combined heat and power
- Control and SCADA systems
- Cooling water systems
- Effluent treatment systems
- Energy conservation
- Fire safety
- Fuel oil and gas systems
- HAZOP studies and risk analysis
- HVAC and refrigeration
- Material and energy balance
- Materials handling
- Scale-up from pilot plants
- Steam generation and distribution
- Stress and seismic analysis
- Water supply and distribution



*Mott MacDonald was proud to be associated with Sandoz, a wholly-owned subsidiary of Novartis-AG, which set up a pharmaceutical formulation facility. We provided basic and detailed engineering and procurement assistance as well as inspection, construction supervision and project management services.*



*Mott MacDonald has considerable direct experience of facility validation and process validation. In addition to undertaking projects throughout India we have completed assignments in Europe, Asia, the Middle East, North and South America.*

### **Business advisory experience**

- Diversification projects in drugs and pharmaceuticals for Cadila Pharmaceuticals
- Opportunity scans in drugs and pharmaceutical sector for Grasim Industries
- Technology status study on Advanced Drug Delivery Systems for the DSIR, Government of India
- Project identification in drugs and pharmaceuticals for Gujarat Steel Tubes
- Project identification in the area of bulk drugs for Cibatul
- Project profiles on L-Lysine, Novaldiamine, L-Methyl Dopa and Cephalosporins for Cibatul
- Technology evaluation and norms study in the drug formulation industry and Paracetamol for the DSIR
- Market studies on Amikacin Sulphate, Acyclovir and Glibenclamide, Ampicillin, Amoxicillin, Cloxacillin, Cephalexin, Cephadroxy and Cephadrine Cephalosporin G, 7ADCA, Cephalosporin C and 7ACA and Vitamin-C
- Technology tie-up exercise for a D-Phenyl Glycine project for Facor Alloys Corporation
- Feasibility for setting up a bulk drugs project for manufacturing Sulphametoxazole, Trimethoprim BP and Ibuprofen BP in Bangladesh for SAARC fund

### **Our track record**

#### ▪ **Projects complying with global regulatory norms**

We have rendered our diverse engineering services for formulation facilities including sterile injectables' oral solids and liquid dosages and multipurpose API plants. Customers include National Pharmaceutical Industries of Oman, Novartis Enterprises, Sanmar Chemicals, Wyeth Lederle in Goa, Wockhardt, Ranbaxy Laboratories, Shreya Biotech, Karnataka Antibiotic and Nicholas Piramal India.

#### ▪ **API projects**

For project profiles – multi purpose API, Cytotoxic API, API Kilo-Lab, Biotech API and API Plants – we have delivered our world class services for clients across the globe. They include Novartis Enterprise, Dr Reddy's Laboratories, Sanmar Chemicals, Ranbaxy Laboratories, Intas Pharmaceuticals, Emcure Pharmaceuticals, Cadila Pharmaceuticals, Rubamin Pharma, Torrent Pharma, Hikal, Wockhardt, Shreya Biotech, Zenotech Laboratories, UCB Pharma, Innova Specialty and Pharma Zell.

#### ▪ **Formulations projects**

At Mott MacDonald we have delivered our multi disciplinary engineering skills for numerous projects – oral solid dosage formulations plant, biotechnology formulation facility, upgrading and modernization of formulations plant, soft gelatin capsules, small volume parenterals, large volume parenterals, medical plastics project and sterile formulations. Our global clients include Cadila Pharmaceuticals; Rhone Poulenc India (now known as Aventis Limited); National Pharmaceuticals Industries, Oman; Nizwa Pharma LLC, Oman; Novartis Enterprises; Core Healthcare; Torrent Pharmaceuticals; Wyeth Lederle; Wockhardt; Wallis Biofarm Limited; Ranbaxy Laboratories Limited etc.



*For National Pharmaceutical Industries' new formulations plant in Oman we took care of aspects ranging from basic engineering design to project management services. We've also provided for other leading pharmaceutical companies such as Pfizer, Lupin, Rhone Poulenc, Novartis and Wyeth Laboratories.*

#### Contact us

D V Saraiya

☎ +91 (0)22 3981 0100

✉ [dv.saraiya@mottmac-india.com](mailto:dv.saraiya@mottmac-india.com)

#### Implementation experience

##### Primary manufacturing facilities

More than 50 API, fine chemicals, intermediates facilities within and outside India for MNCs and leading Indian corporations covering synthetic chemistry and extraction as well as combination technologies.

##### Secondary manufacturing facilities

More than 40 formulation plants for various dosage forms including coated/uncoated tablets, hard/soft gelatin capsules, ointments, injectables and liquids for global majors and Indian transnational corporations.

##### Bio-tech facilities

Four biotechnology derived products' plants with a leading Indian multinationals covering bacterial fermentation, mammalian cell cultures and formulations thereof.

##### Studies and reports

More than 50 studies and reports, like conceptual design, feasibility with cost estimates, scale up, environmental due diligence, asset valuation, etc.

##### US FDA/UK MHRA/EU approved facilities

Some already approved and currently executing 6 facilities designed for approval by global regulatory agencies like the EU/US FDA/TGA etc.

*From concept development, engineering and tendering, site supervision to quality assurance services for construction of 25 mn GBP state of the art pharmaceutical production facility – Nicholas Piramal oral solid and liquid dosage formulation plant at Baddi, Himachal Pradesh.*



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