

A PROFILE



FACT Engineering & Design Organisation

A Division of

The Fertilisers And Chemicals Travancore Ltd.

(A Government of India Enterprise)

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1 OUR BACKGROUND

- 1.1 FACT Engineering & Design Organisation (FEDO), is a premier engineering consultancy organisation of India, engaged in design, engineering and implementation of projects in process, oil & gas and allied industries. We form part of a multi-divisional company, the Fertilisers And Chemicals Travancore Ltd (FACT), a Schedule-'A' category Government of India Enterprise, under the administrative control of the Department of Fertilisers in the Ministry of Chemicals & Fertilisers.
- 1.2 FEDO's symbiotic relationship with FACT endows us with certain unique strengths that most other Indian consultants do not possess. These include access to FACT's rich database on building and managing of plants, based on different generations of process technology, availability of experienced personnel, support of sister divisions like FACT Engineering Works (engaged in equipment fabrication), Computer Services Centre, R & D Centre, Management Development Centre etc. The financial backing of FACT, with an annual turnover in excess of ₹17450 million (US \$275 million) adds to our credibility with clients, while awarding high value LSTK (Lumpsum Turnkey) contracts to FEDO.
- 1.3 In May 1995, FEDO became the first project engineering Consultant in India to be awarded the prestigious international quality certification ISO 9001 (1994 revision) for our quality systems and procedures. Presently, it has been upgraded to the ISO 9001:2008 version, and getting ready for revision to ISO 9001:2015, due in 2017.

2. SERVICES OFFERED

- 2.1 In the fifty eight years of its existence, FEDO has served an impressive array of clients in diverse fields of operation. Indian blue chip companies operating in the petroleum, refining and fertilizer sectors have utilized our services for their prestigious projects during this period. FEDO's operations have been extended in big way to Infrastructure sector also, catering its services to major Educational Institutions of the country.
- 2.2 Besides taking up projects on a concept-to-commissioning basis, FEDO also undertakes pure consultancy jobs for owners who are capable of managing the fine intricacies of project implementation - technology sourcing, procurement and construction - themselves.
- 2.3 Our consultancy services package comprises:
 - >> Pre-project activities like preparation of Techno-Economic Feasibility Reports, Detailed Project Reports, Hazop studies, selection and transfer of technology and assisting owner in liaising with statutory bodies and project financing agencies;
 - >> Supply of know-how and basic engineering packages for processes developed in-house and preparation of basic engineering package for commercial sized plants based on pilot plant data;

- >> Providing detailed engineering, procurement assistance, construction supervision and commissioning assistance during project execution stage;
- >> Inspection, including third party inspection and expediting services;
- >> Project management services comprising of planning, cost control and associated MIS;
- >> Trouble-shooting and maintenance services for running plants;
- >> Undertaking revamp and retrofit of ailing plants;
- >> Electrical System/Power System Analysis using ETAP Software and
- >> Conducting safety, energy and environmental audits, HAZOP and HAZAN studies, disaster management studies, lightning protection adequacy studies etc. of existing plants;
- >> Fire & Safety Engineering including adequacy study of existing Fire Protection Systems, Fire Fighting facilities and Safety systems;
- >> Health Study and Weak Area Analysis of Process Plants.

3. FIELDS OF OPERATION

- 3.1 Over the years, FEDO has actively participated in the industrialisation process by helping both private promoters and Government agencies in setting up viable units. Our clients include:
- >> Oil & Natural Gas Corporation Ltd, Gas Authority of India Ltd, Indian Oil Corporation Ltd, Hindustan Petroleum Corporation Ltd, Bharat Petroleum Corporation Ltd, IBP Co Ltd, Chennai Petroleum Corporation Ltd, BPCL-Kochi Refineries, etc. in the oil, gas and refining sector.
 - >> Krishak Bharati Co-operative Ltd, Indian Farmers' Fertiliser Cooperative Ltd, Madras Fertilizers Ltd, Fertiliser Corporation of India Ltd, Hindustan Fertilisers Corporation Ltd, Southern Petrochemical Industries Corporation Ltd, Tuticorin Alkali Chemicals & Fertilisers Ltd, Paradeep Phosphates Ltd, Pyrites, Phosphates & Chemicals Ltd, Indo Gulf Fertilisers & Chemicals Corporation Ltd, Oswal chemicals & Fertilizers Ltd, Gujarat State Fertilizer Corporation, Gujarat Narmada Valley Fertilizer Corporation Ltd, Mangalore Chemicals & Fertilizers Ltd. in the fertilizer sector.
 - >> Hindustan Organic Chemicals Ltd, Hindustan Zinc Ltd, Hindustan Copper Ltd, Kerala Chemicals & Proteins Ltd, Travancore Titanium Products Ltd, Binani Zinc Ltd, Hindustan Lever Ltd, Gujarat Narmada Valley Fertiliser Company Ltd, Hindustan Insecticides Ltd, Indo German Carbons Ltd, etc from the other sectors of process industry.

- >> Kerala Infrastructural Development Corporation (KINFRA), KINFRA Export Promotion Industrial Parks (KEPIP), Kerala State Industrial Development Corporation (KSIDC), Roads & Bridges Development Corporation of Kerala Ltd. (RBDCK) etc. in the infrastructure sector.
 - >> For the ongoing projects in the Infrastructure sector, the client list includes National Institute of Technology, Nagaland and Kendriya Vidyalaya Sangathan, New Delhi and residential township development for BPCL,Kochi..
- 3.2 For these clients, we have executed projects in fields like:

Fertilisers	Ammonium Chloride, Ammonium Sulphate, Mono and Di Ammonium Phosphate, Urea, Complex Fertilisers etc
Petrochemicals	Caprolactam, Phenol, Methanol, Mono Chloro Benzene etc
Refining & distribution	Unit revamps, tank farms, oil depots, LPG bottling plants, floating roof tankage – Crude and Product tankages, natural gas distribution system etc
Pesticides	DDT, Dicofol, Benzene Hexa Chloride, Bio-pesticides, Mancozeb. etc
Intermediates	Acids (organic and inorganic),Ammonia, Hydrogen etc
Industrial chemicals	Ammonium Chloride, Ossein and Di Calcium Phosphate, Gelatin, Sodium Bi Carbonate etc
Antibiotics	Streptomycin, Penicillin etc
Environmental	Physico-chemical and biological engineering effluent treatment plants, gas scrubbing system, stacks etc
Infrastructure	National Highways, Industrial parks, Textile parks, Video Park, IT Park, Industrial Infrastructure Development Centres (IIDCs)., Crude Receipt Facilities, NIT, Kendriya Vidyalaya campus development, High rise apartments and residential townships for clients in urban centers,etc.

- 3.3 Apart from engineering and building main plants, FEDO also undertakes offsite facilities such as utility systems, raw material/product storage and handling systems, fire fighting facilities, EHV power receiving stations, captive power generation plants, non-plant buildings and industrial townships.

4. SYSTEM STRENGTHS

4.1 Organisational Structure

Our parent company, FACT Ltd. is a multi-divisional company. Besides FEDO, it has

- Two fertiliser manufacturing Divisions - Udyogamandal Division and Cochin Division - located at Udyogamandal and Ambalamedu respectively, producing Urea, Ammonium Sulphate, DAP, Complex fertilisers etc;
- a Petrochemical Division at Udyogamandal producing Cyclohexanone and Caprolactam;
- an Equipment fabricating Division - FACT Engineering Works (FEW) - at Palluruthy; and
- a central Marketing Division for fertilisers and chemicals, headquartered at Udyogamandal.

(Udyogamandal, Ambalamedu and Palluruthy are industrial locales situated just outside the city limits of Kochi in Kerala, one of the southern states of India).

FACT is managed by a Board of Directors. The Chairman of the Board is also the Managing Director. We also have a full-time Finance Director, a Technical Director and a Marketing Director. There are also several part-time Directors on the Board, who are nominees of the Central and State Governments.

FEDO, like other Divisions of FACT, is headed by a General Manager/Chief Operating Officer. The operations are streamlined by the coordinated work of various Groups, viz. Process Technology, Engineering, Projects, Construction, Materials, Finance, Commercial, Personnel etc. The Groups are usually headed by General Managers. The various Departments in each Group are headed by Deputy General Managers.

4.2 **Human resources**

FACT has employee strength of around 2500 spread across its various Divisions. FEDO is a professional - dominated division with majority staff members with technical qualifications and engineers, many with post-graduate qualifications in engineering and management subjects, distributed across the various specialized disciplines.

FACT lends its personnel from the production and fabricating Divisions to FEDO, whenever FEDO has to take up operations & maintenance assignments or when plant commissioning / site fabrication expertise is required.

FEDO designs are tempered with the plant experience gathered by our personnel during the periodic job rotations.

Our designers also gain invaluable insights into the latest international developments in the practice of design, engineering, project and construction management through their association with various process licensors and engineering contractors in different projects, participation in technical seminars, training programmes etc. Our Material Procurement group is also acquainted with international competitive bidding procedures and procurement practices through their involvement in projects funded by bi-lateral and multi-lateral

funding agencies like the World Bank, Overseas Economic Cooperation Fund etc.

4.3 **Computer facilities**

FACT was one of the first Indian companies to computerize its operations, way back in 1965. This head start is maintained even today with computers finding applications in integrated maintenance and materials management systems, vendor information systems, HRD database, plant optimization projects, product distribution monitoring etc besides routine accounting and MIS functions. A vast array of hardware, ranging from mainframe and super minis to PCs, Plotters, Printers, Scanners are used for this purpose and distributed on a network, FACTNET and SAP which provides connectivity and resource sharing.

Advanced engineering and design software is utilized to develop optimum designs for plant and machinery.

Besides running advanced design and engineering software, computers are also used for communications. Internet connectivity and e-mail communication facility make decision taking and implementation faster and more client-friendly.

4.4 **Geographical Network**

FEDO carries out most of the engineering and procurement activities from the home office at Udyogamandal, near the city of Kochi in the Kerala State.

FEDO has an office in Mumbai, mainly for liaison work related to various projects. Depending on vendor distribution pattern, expediting centres is opened for short duration at other locations as required.

FEDO has an office at New Delhi for business development of northern region and liaison with Government, financing agencies and clients located in that area. COO of FEDO is headquartered at Delhi office.

FACT Marketing offices in places like Chennai, Hyderabad, Bangalore and Trivandrum act as communication links for FEDO.

4.5 **Technological Capabilities**

FEDO has own process know-how for the production of Hydrogen (low capacity plants), Sulphuric acid and Effluent Treatment Plants for fertilizer, petroleum and petrochemical plants.

FEDO concludes tie-ups with globally reputed technology licensors for sourcing know-how for projects in other areas, on a case to case basis.

We also provide detailed engineering and allied services for technologies identified and sourced by clients themselves for their projects. In this way, we have worked in association with reputed international firms like MW Kellogg, Haldor Topsoe, Stamicarbon, Chiyoda, Toyo Engineering, United Oil Products, BASF, INCRO, PRAYON, OTOTEC, LURGI, etc.

4.6 **Recognitions**

FEDO has been awarded ISO 9001 quality certification for our systems and procedure for activities connected with project execution such as engineering, procurement, construction etc. The certification was given in May 1995 by Det Norske Veritas Quality Assurance Ltd, the UK based accredited quality auditors. In May 1998, a re-certification audit was conducted by Det Norske Veritas Quality Assurance Ltd, The Netherlands and the certification was extended for a further period of three years. A second re-certification audit was conducted in July 2001 by Det Norske Veritas Quality Assurance Ltd, The Netherlands, and the certification extended for another three years. FEDO has been awarded ISO 9001:2008 in November 2009 onwards as recertification by DNV and is migrating to 2015 version of QMS9001 in Engineering consultancy.

FEDO has been recognized by the Electrical Inspectorate of the Government of Kerala for undertaking the statutory Electrical Energy Audit of Industrial undertakings.

FEDO personnel have served on important policy-making bodies like the Bureau of Indian Standards etc.

5 PROJECT MANAGEMENT STYLE

5.1 Deputy General Manager (Projects) at senior level heads project managers with a multi-disciplinary Task Force comprising specialists from the following streams in a matrix form:

- * Process Technology & Systems design.
- * Engineering - Civil & Structural, Mechanical, Electrical and Instrumentation.
- * Planning, cost control and Management Information System.
- * Procurement, Purchase, Inspection & Expediting.
- * Vendor Coordination
- * Traffic & Stores Management
- * Site Management

5.2 The site organisation will be headed by a Resident Chief Construction Manager who will be assisted by specialists in erection / construction.

5.3 This Task Force will be totally responsible for the project from start to finish. It will ensure completion of the project on schedule, within defined costs and achievement of the guaranteed performance.

6 MAJOR INDIAN PROJECTS COMPLETED BY FEDO

6.1 Since inception FEDO has executed a number of projects, either using its own process know-how or know-how obtained from other process owners. A representative list would read like this:

- * 4 Petrochemical plants (Phenol, Caprolactam, Methanol & Mono Chloro Benzene)

- * 13 Ammonia/Hydrogen plants based on steam reforming of hydrocarbons
- * 1 Urea Plant revamp project
- * 19 Sulphuric acid plants
- * 5 Phosphoric acid plants
- * 2 Formic acid plants
- * 2 Nitric acid plants
- * 10 Fertiliser salt plants (N, NP & NPK fertilisers like DAP, SSP, Urea, Ammonium Sulphate, Ammonium Chloride etc)
- * 7 Pesticide Plants, (DDT, Endosulphan, Malathion, Gamma Benzene Hexa Chloride, Dicofof, Bio-pesticides and Mancozeb)
- * 3 Mini Cement plants
- * 3 Antibiotics plants (Streptomycin, Penicillin, Ampicillin)
- * 3 Non-ferrous metallurgical plants (for mercury & silver recovery)
- * 7 Effluent treatment plants
- * 5 Captive power plants
- * 3 LPG Bottling plants.
- * 5 Bulk Oil Terminals
- * 2 Large diameter Floating roof tankage projects
- * 8 Oil Depots
- * 4 fine chemical plants (Ossein, Di Calcium Phosphate, Gelatin, Sodium bi Carbonate).
- * 12 Refinery related projects
- * 8 Cross-country oil product pipelines
- * 3 Natural Gas related projects
- * 6 Cross country water pipelines
- * Single Point Mooring (SPM) Project for BPCL-KR
- * 12 Infrastructure projects
- * 2 Adequacy Study of Fire Water Network
- * 3 Revamp / Extension of Electrical Systems

6.2 A number of Utility plants and off-site facilities including solid and liquid raw material storage and handling, power receiving and distribution, Rock Phosphate storage handling and grinding, sulphur storage and handling, raw water pumping, cooling towers, in-plant buildings, off-site buildings and peripheral facilities have also been executed by us as part of various projects.

6.3 FEDO has also been involved in Indian Space and Defence Research through the execution of a few vital projects.

6.3 FEDO has considerable experience in carrying out of Techno-Economic Feasibility studies, Detailed Project Reports, End-to-end surveys, Safety Audits and Energy Audits.

6.4 FEDO is now tapping the potential in the Infrastructure sector of the Indian economy and has geared up fully to undertake depositary jobs from clients for campus development for NIT/Central Universities/Schools & Colleges, townships development for clients, PMC services for high rise signature malls/building complexes, IT parks and CSR Projects with infrastructure intensity, Civil aviation projects, development and refurbishing of housing colonies and residential habitats etc. Also FEDO intends to offer procurement services for clients along with Engineering services as a package solution provider.

7 OVERSEAS PROJECTS

- FEDO has been active on overseas projects in the middle east on a wide scale, viz.,
- >> Providing engineering services for Sahi Rawl Water disposal project of Petroleum Development Oman, sub-contracted from the EPC contractor, Al-Hassan Trading & Contracting Co, Muscat, Oman.
 - >> Providing maintenance services for rotating equipment of Petrochemical Industries Company, Kuwait, contracted through Abdul Aziz Yousuf Al-Essa, Kuwait.
 - >> Providing technical assistance for procurement of rotating equipment to ABB Global Engineering, Qatar.
 - >> Providing inspection services to Kuwait Oil Company, Kuwait sub-contracted from the maintenance contractor, El Dabhous, Kuwait.
 - >> Providing engineering services for Ahmadi and Sabhan Oil depot projects in Kuwait for Kuwait National Petroleum Company, sub-contracted from the EPC contractor, Abdul Aziz Yousef Al-Essa, Kuwait.
 - >> Providing detailed engineering services for the 2.5 km long Inter Refinery Transfer pipeline connecting the Shauiba and Mina Ahmadi refineries of Kuwait National Petroleum Company, sub-contracted from the EPC contractor, Abdul Aziz Yousef Al Essa, Kuwait. Overall project management consultancy for this project was provided by Flour International, USA.
 - >> Providing plant operation services for DM Water plant contracted through Abdul Aziz Yousef Al Essa, Kuwait.
 - >> Providing engineering services for the revamp of steam system (involving utility boilers and associated piping) of Kuwait National Petroleum Company, Kuwait, sub-contracted from the EPC contractor, Abdul Aziz Yousef Al Essa, Kuwait. Overall Project Management Consultancy was provided by Stork Ketels, The Netherlands.
 - >> Developing detailed process design for Gas separators (for separating associated gas and free water from crude oil) for the gathering station of Kuwait Oil Company, Kuwait sub-contracted from the equipment supplier, KREMENCO, Kuwait.
 - >> Providing design and engineering services for the Acid Washing system in the Salt & Chlorine plant of Petrochemical Industries Company, Kuwait, sub-contracted from the EPC contractor, Abdul Aziz Yousuf Al-Essa, Kuwait.
 - >> Providing design and engineering services for the 'Replacement of Water and Gas Networks at Ahmadi' for Kuwait Oil Company (KSC) together with Jaseem Qubazard Engineering Consultants under the subcontract of United Gulf Construction Company (UGCC), Kuwait.
 - >> Design & Engineering of Tanks for M/s Al Bucheeri Engg. Services, UAE.

8 ADDRESSES & KEY PERSONNEL

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