A HISTORY OF PROJECTS
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inelectra began its long record with projects centered on the electricity sector; 40 years later, it is a leading corporation in the development of high valued-added integrated technical solutions for the world energy sector.

The projects described below represent the consolidation of the experience of a human group that forms one of the 50 most important engineering and construction companies in the worldwide energy sector and one of the three largest in Latin America.
Crude refining
ULSD Compliance, Lemont and Corpus Christi Refineries, United States

October 2007 - April 2009

Engineering, assistance with procurement and construction management for expansion and operational improvements of the Lemont (Illinois) and Corpus Christi (Texas) refineries owned by CITGO Refining & Chemicals Co. L.P. The Ultra Low Sulfur Diesel (ULSD) Compliance project comprises two hydrotreatment units, designed to comply with the specifications for sulfur content in diesel fuel of 15 ppm or lower established by federal regulations for the US market. Detail engineering is executed in Venezuela by specialists from the inelectra-Otepi-Tecnoconsult association, and in the United States by staff from Mustang Engineers and Constructors L.P., selected by CITGO as technical leader of the project.

Scope:
- Conceptual, basic and detail engineering
- Support for procurement
- Construction management

Scheme: Reimbursable

Location: Illinois and Texas, United States

Client: CITGO Refining & Chemicals Co. L.P.

Execution Center: Caracas

Project in figures:
- Man-hours to be executed in Venezuela: 320,000

Deep Conversion, Phase I, Venezuela

June 2007 - September 2008

Modification and expansion of the facilities of the Puerto La Cruz Refinery to process heavy crude (16° API) and improve margins with quality products for export, increasing processing and export capacities to 170,000 BPD and 98,000 BPD, respectively. Includes revamp of the DA-1 and DA-2 Atmospheric Distillation units for processing 80,000 and 90,000 BPD of Merey heavy crude, construction of a Vacuum unit of 117,000 BPD, a Deep Conversion unit of 50,000 BPD based on Intevep HDHPlus technology, a Sequential Hydroprocessing (SHP) unit of 100,000 BPD with Axens technology, auxiliary and service units, interconnections and tanks. Project executed by the CONFEED consortium formed by JGC Corporation and inelectra.

Scope:
- Phase I:
  - Basic engineering (FEED)
  - Cost estimate Class II
  - Assistance with early procurement of major equipment
  - Early works for site preparation

  Phase II:
  - Detail engineering
  - Procurement management
  - Construction management
  - Pre-commissioning and commissioning of facilities, including integration of all offsites and utilities

Scheme: Reimbursable

Location: Puerto La Cruz, Anzoátegui state, Venezuela

Client: PDVSA Petróleo S.A.

Execution Center: Caracas

Project in figures:
- Man-hours to be executed by the Consortium in Phase I: 1,200,000
- Man-hours to be executed by inelectra in Phase I: 530,000
Fuel Hydrotreatment, Barrancabermeja Complex, Colombia

January 2007 - October 2009

Interconnection between processes (ISBL) and service areas, hydrogen compressor, expansion of cooling tower and revamp of pump house Nº 2. Procurement scope includes seven pumps, a hydrogen compressor with power and control systems, shelter structure with its bridge crane, 1,100 tons of piping and a cooling tower cell with corresponding fan.

Scope:

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Scheme:

EPC Lump Sum

Location:

Barrancabermeja, Santander department, Colombia

Client:

Ecopetrol S.A.

Execution Center:

Caracas

Project in figures:

Man-hours of execution: 1,631,959
m of piping: 41,181
Nº of accessories: 2,552
Nº of valves: 1,002
Nº of instrumentation valves: 108
Nº of instruments: 502
Nº of pumps: 14
Nº of compressors: 1
Nº of cooling towers: 1
m of instrumentation cables: 1,442
m of electric cables: 38,598
m of tubing: 2,551
Master Engineering Contract, Barrancabermeja Complex, Colombia

December 2006 - December 2009

Specialized technical assistance and development of conceptual, basic and detail engineering, including cost estimates for construction, procurement requisitions, and budgets required for plant shutdown and the replacement and investment projects developed in the VRP Group A.

Scope:

Conceptual, basic and detail engineering

Scheme:
Reimbursable

Location:
Barrancabermeja, Santander department, Colombia

Client:
Ecopetrol S.A.

Execution Center:
Colombia

Project in figures:
Man-hours of execution: 99,000

Expansion of Cartagena Refinery, Spain

October 2006 - March 2010

Construction of a new Hydrocracking unit and two new Hydrogen units as part of the Cartagena Refinery expansion project, with the purpose of equipping it with a productive scheme to process high sulfur crudes, increasing its existing distilling capacity of 5,500 kt/year to 11,000 kt/year. Includes technical assistance for Engineering, Procurement and Construction that Técnicas Reunidas executes under the Lump Sum - Turnkey scheme.

Scope:

Technical assistance for Engineering, Procurement and Construction

Scheme:
Reimbursable

Location:
Valle de Escombreras, Cartagena, Murcia province, Spain

Client:
Técnicas Reunidas S.A.

Execution Center:
Madrid

Project in figures:
Man-hours of execution: 28,799
Flare Gas Recovery - CILP, La Plata Refinery, Argentina

February 2006 - August 2007

Reduction of gas emissions from the refinery, with the use of gas usually vented through flares, sending this recovered gas to the fuel gas system. Two compression systems will be installed, one for flares 1 and 2 and the other for flare 3. The implementation of this project resulted in energy saving at the refinery since this vented gas is used as fuel gas, and it also reduces the consumption of steam sent to the flares due to the lower amount of gases to be burned. The Extended Basic Engineering (EBE) complements and integrates the basic engineering of the Flare Gas Recovery units. The Property Engineering (PE) includes external assistance services for the supervision, control and management of the project in its detail engineering, procurement and construction stages, by means of the assignment of professional, technical, administrative and qualified support staff. The Engineering, Procurement and Construction (EPC) covers detail engineering, supply of equipment, materials and spare parts; construction, assembly, precommissioning, commissioning and start-up support.

Scope:

Extended Basic Engineering (EBE)
Property Engineering (PE)
Engineering, Procurement and Construction (EPC)

Scheme:
EPC Lump Sum

Location:
La Plata, Buenos Aires province, Argentina

Client:
Repsol YPF

Execution Center:
Buenos Aires

Project in figures:
Man-hours EBE: 8,791
Man-hours PE: 9,070
Man-hours EPC: 193,510

Dung Quat Refinery, Vietnam

January 2006 - February 2008

Detail engineering corresponding to the disciplines of piping, civil, electricity and instrumentation of the Crude Distillation unit (CDU) with capacity to process 148,000 BPD; Kerosene Treatment unit (KTU) with 51,500 kg/h capacity, and Fuel Gas unit (FGU) with 25,730 kg/h capacity for a new refinery with an annual processing capacity of 6.5 million tons of crude to produce gasoline, jet kerosene, diesel, fuel oil, propylene and LPG. Includes assistance to Técnicas Reunidas for execution of detail engineering by assigning staff in their offices in Madrid, Spain. EPC Project executed by the consortium formed by Technip, JGC Corporation and Técnicas Reunidas.

Scope:

Detail engineering for CDU, KTU and FGU units
Procurement
Assistance to Técnicas Reunidas in the execution of detail engineering

Scheme:
Lump Sum for professional fees + reimbursable expenses

Location:
Dung Quat, Quang Ngai province, Vietnam

Client:
Técnicas Reunidas / PetroVietnam

Execution Center:
Caracas / Madrid

Project in figures:
Man-hours of engineering: 112,000
Remodeling of the Topping I and Vacuum Units, San Lorenzo Refinery, Argentina

November 2005 - December 2006

Remodeling of Topping I and Vacuum units to increase processing capacity from 1,300 m³/d to 2,600 m³/d of “María Inés” crude (Design Case) and “Medanito”, together with increasing the distillates yield and improve the energy recovery with minimum modifications possible in the existing exchange circuit. The engineering includes review of basic engineering, preparation of detail engineering, technical analysis of offers of equipment and materials supplied, and preparation of project as built plans. Procurement covers management of purchasing and supply of equipment and materials required for implementation of the modifications of the plants, follow-up and inspection of equipment and materials, and supply of spare parts and operation. Construction includes assembly and testing of new equipment and installations, works with the plant in operation and during plant shutdowns, dismantling of equipment placed out of service, precommissioning, commissioning and start-up assistance.

Scope:
- Review of basic engineering
- Detail engineering
- Procurement
- Construction

Scheme:
EPC Lump Sum

Location:
San Lorenzo, Argentina

Client:
Petrobras Energia S.A.

Execution Center:
Buenos Aires

Project in figures:
Man-hours of management, engineering, procurement and construction management: 137,908
Man-hours of direct labor: 365,000 without incapacitating accidents
**Rabigh Refinery, Saudi Arabia**

**July 2005 - September 2007**

Review of basic and detail engineering in Venezuela in the disciplines of piping, civil, instrumentation and electricity for the Sulfur Recovery unit (SRU) with 7.6 t/h capacity, and the Hydrogen unit (HPU) with a capacity of 552 t/d. The detail engineering of Vacuum unit (VDU) with a capacity of 166,000 BPD of atmospheric residue and over 37,000 BPD of HGO was executed in Spain. Includes professional multidisciplinary support for Técnicas Reunidas with the detail engineering of other units, procurement and follow-up of materials and equipment, and constructability studies for the plant and support for construction with assignment of staff in Madrid and Saudi Arabia.

**Scope:**
- Review of basic and detail engineering for SRU and HPU units
- Detail engineering of VDU unit
- Assistance to Técnicas Reunidas in various disciplines

**Scheme:**
- **Venezuela:** Lump Sum
- **Spain:** Reimbursable

**Location:**
Rabigh, Makhh province, Saudi Arabia

**Client:**
Técnicas Reunidas / ARAMCO Overseas Company and Sumitomo Chemical Co. Ltd.

**Execution Center:**
Caracas / Madrid

**Project in figures:**
- Man-hours executed in Spain and Saudi Arabia: 240,000
- Man-hours executed in Venezuela: 85,000

**Paraffins Plant, Barrancabermeja Refinery, Colombia**

**January 2005 - May 2006**

Review of basic engineering, detail engineering, procurement and construction of the Dewaxing unit with MEC to increase the processing capacity of medium and light wax distillate from 3,600 BPD to 4,800 BPD (33%) and paraffin lubricant bases from 2,880 BPD to 4,080 BPD (42%) to generate dewaxed oils, hard and soft waxes (lubricant base). Its objective is to increase the operating reliability of the Dewaxing unit with MEC of the Paraffins plant and substantially reduce the emissions of solvents into the atmosphere. Executed in strategic association with Schrader Camargo Ingenieros Asociados.

**Scope:**
- Review of basic engineering
- Detail engineering
- Procurement
- Construction
- Support for commissioning

**Scheme**
- **Venezuela:** Lump Sum
- **Spain:** Reimbursable

**Location:**
Rabigh, Makhh province, Saudi Arabia

**Client:**
Ecopetrol S.A.

**Execution Center:**
Caracas / Madrid

**Project in figures:**
- Man-hours of engineering: 30,000
- Man-hours of construction: 340,000
**FCC Cardón Unit Expansion, Venezuela**

**November 2004 - August 2008**

Adaptations and modifications to the existing FCC Cardón unit located in the Paraguana Refining Center (CRP Complex), to increase processing and conversion capacities by 15% and 6% respectively, achieve five-year plant runs, adapt emission of solid particles to Venezuelan environmental regulations, optimize equipment shutdown time, and restore the conditions of reliability of the systems and/or facilities, which require maintenance with the plant out of service. Includes replacement of reactor and regenerator dome with their cyclones, the heat recovery generator and the regenerator downcomer, along with improvements to pre-heating train and minor equipment. Project executed by the FCC Cardón Consortium formed by inelectra and Tecnoconsult.

**Scope:**
- Detail engineering
- Support for procurement management
- Support for construction management

**Scheme:**
Reimbursable

**Location:**
Paraguana, Falcón state, Venezuela

**Client:**
PDVSA Petróleo S.A.

**Project in figures:**
Man-hours executed by the consortium: 600,000
Man-hours executed by inelectra: 300,000

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**GEP 4, “General Lázaro Cárdenas” Refinery, Mexico**

**October 2004 - November 2009**

Supervision of works of the EPC contract for reconfiguration of the “General Lázaro Cárdenas” Refinery, which consists of a 50,000 BPD Gasoil Hydrodesulfurization unit, a 48 MMM SCFD Hydrogen plant and a 600 t/day Sulfur Recovery plant, which includes Claus section and tail gas treatment. Executed by the inelectra COOPSA association.

**Scope:**
- Engineering
- Procurement
- Construction
- Testing and commissioning
- Project and Quality System control

**Scheme:**
Professional services at unit price and specific time

**Location:**
Minatitlán, Veracruz, Mexico

**Client:**
PEMEX Refining

**Execution Center:**
Caracas

**Project in figures:**
Man-hours of execution: 393,832
Sulfuric Acid Plant, Barrancabermeja Complex, Colombia

December 2000 - February 2002

Technological upgrade of the Sulfuric Acid plant, which has a production capacity of 90 tons of sulfuric acid per day. Includes review of the basic engineering (front-end), integration of the plant engineering with the design of the external installations developed by Ecopetrol, detail engineering, purchasing, supply, inspection and follow-up of all the material and equipment required, construction, acceptance testing and start-up. Executed in consortium with the Colombian company H.L. Ingenieros.

Scope:

- Review of basic engineering
- Detail engineering
- Procurement
- Construction
- Start-up

Scheme:

Lump Sum - Turnkey

Location:

Barrancabermeja, Santander department, Colombia

Client:

Ecopetrol S.A.

Execution Center:

Colombia

Project in figures:

Man-hours of execution: 300,000

“Orthoflow” Catalytic Cracking Unit, Barrancabermeja Complex, Colombia

December 1997 - August 1999

Detail engineering, procurement, construction and start-up of revamping and technological updating of the “Orthoflow” Catalytic Cracking unit in the Barrancabermeja Complex -the largest oil refining center in Colombia- to reach a processing capacity of 26,000 BPD, 18% higher than previous nominal capacity, and produce better gasoline with more consistent quality.

This project successfully maintained production capacity of products with higher efficiencies in their processes, replacing assets, which had reached the end of their useful life. Major equipment was purchased in advance by the client; inelectra participated in the in-factory inspections and coordination of transport logistics to the worksite, which, in the case of the reactor and stripper, required transport by barge upstream along the Magdalena river from Barranquilla to Barrancabermeja; loading and unloading were roll on-roll off.

Scope:

- Engineering
- Procurement
- Construction

Scheme:

EPC Lump Sum

Location:

Barrancabermeja, Santander department, Colombia

Client:

Ecopetrol S.A.

Execution Center:

Bogotá

Project in figures:

Man-hours of execution: 570,000
CNF-TAME Plant, Venezuela

August 1996 - April 1999

Construction in Amuay Refinery of a plant to produce Ter-Amyl-Methyl-Ether (TAME), additive to increase the octane of gasoline which replaces the lead tetraethyl from the catalytic naphtha coming from the Flexicracker plant (DCAY). Includes construction of the Catalytic Naphtha Fractionating (CNF), extraction of C5s-C5 MEROX Pentanes and production of TAME, and equipment for interconnection with existing facilities for transport and storage of primary and secondary products, feedstock, services, and improvements to facilities to handle the new products and feed and service requirements. Project executed by inelectra with the technical support of M.W. Kellogg.

Scope:

| Basic and detail engineering |
| Procurement                  |
| Construction                |
| Precommissioning            |
| Assistance with start-up    |

Scheme:

EPC Lump Sum - Turnkey

Location:

Amuay, Falcón state, Venezuela

Client:

Lagoven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:

Man-hours of execution: 437,324
Alkylation Plant, Barrancabermeja Complex, Colombia

January 1996 - December 1997

Technological upgrade of the Alkylation plant to improve the production system of high-octane gasolines, using optimized processes to minimize the environmental impact. The new plant is formed by three basic units: Desulfurization with MEROX technology developed by UOP for the olefin desulfurization process; Hydro-isomerization with technology from the French Petroleum Institute for the hydro-isomerization process; and Alkylation of Olefins with Stracto technology for the alkylation process with sulfuric acid. Executed in consortium with the Colombian company Termotécnica S.A.

Scope:

| Engineering | Procurement | Construction |

Scheme:
Lump Sum

Location:
Barrancabermeja, Santander department, Colombia

Client:
Ecopetrol S.A.

Execution Center:
Colombia

Project in figures:
Man-hours of execution: 20,795
Cardón Refinery (PARC) “D” Package Adaptation, Venezuela

Expansion of the Cardón Refinery to adapt the refining pattern and increase reliability and safety of the facilities, as well as processing 60,000 BPD of heavy and extra heavy crudes, with a total processing capacity of 300,000 BPD. Includes project management, as part of the Maraven management team for A, B and C packages, as well as development of basic and detail engineering, procurement and construction of Package D, comprising the industrial services for the process plants, control systems and support infrastructure for construction.

Scope:
- Basic and detail engineering
- Procurement
- Construction

Scheme:
Reimbursable services

Location:
Cardón, Falcón state, Venezuela

Client:
Maraven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 1,954,000

FCC, Gas Plant and Gasoline Treaters 2/3 Revamp, Venezuela

January 1991 - July 1992
Review of basic engineering, execution of detail engineering for fabrication of equipment, procurement and construction for the revamp of the Catalytic Disintegration plant and Gasoline Treaters 2/3 Plants of Cardón Refinery in order to raise production capacity of optimum quality gasoline to maximum, and comply with the environmental regulations on emissions which came into force in the 1990s at world level. Includes the replacement of reactor and regenerator dome with its cyclones, installation of new equipment, transport to worksite and interconnection with existing facilities.

Scope:
- Engineering
- Procurement
- Construction

Scheme:
EPC Lump Sum

Location:
Cardón, Falcón state, Venezuela

Client:
Maraven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 372,602
Alkylation Unit Revamp,
Venezuela

November 1989 - May 1991
Basic and detail engineering, assistance for procurement and construction planning for modification of the Alkylation unit of the Puerto La Cruz Refinery to increase capacity of load treatment from 2,500 BPD to 3,660 BPD of olefins, incorporating updated technology to guarantee operating continuity under conditions of maximum efficiency, operational safety and minimum maintenance cost.

Scope:
- Basic and detail engineering
- Assistance with procurement
- Construction planning

Scheme:
Professional fees + reimbursable expenses

Location:
Puerto La Cruz, Anzoátegui state, Venezuela

Client:
Corpoven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 51,414

High Vacuum Units 2/3 Revamp,
Venezuela

November 1987 - October 1990
Detail engineering, procurement and construction for the revamp of High Vacuum Plants 2/3, Tapper CD-4 and Viscosity Reducers VB-1 and 2 of the Cardón Refinery in order to substantially increase production of the widest range of vacuum distillates, and significantly increase the operating efficiency and reliability of these units. Includes replacement of all internal components of the vacuum towers, transfer line and radiation and convection sections of the furnaces and vacuum system, major modifications to the pre-heating trains of both units to improve thermal balance, and replacement of bottom pumps of the towers. Project executed by inelectra with technical assistance from Foster Wheeler.

Scope:
- Engineering
- Procurement
- Construction

Scheme:
Reimbursable EPC

Location:
Cardón, Falcón state, Venezuela

Client:
Maraven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 339,632
Catalytic Disintegration Unit Revamp, Venezuela

August 1987 - January 1989

Engineering, assistance for procurement and supervision of construction for the revamp of the Catalytic Disintegration unit (RFCC), Puerto La Cruz Refinery. Includes installation of an external reaction system; modifications to catalyst stripper and internal components of the regenerator; replacement of air distribution system, refractory coatings, and the field pneumatic instrumentation; construction of new control room and consolidation of the automatic conversion system.

Scope:

- Engineering
- Assistance with procurement
- Construction supervision

Scheme:
Professional fees + reimbursable expenses

Location:
Puerto La Cruz, Anzoátegui state, Venezuela

Client:
Corpoven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 45,070
Gasoline Blending System, Venezuela

May 1978 - March 1980
Cost estimates, detail engineering and procurement for the Gasoline Blending system, with a capacity of 13,000 liters per minute, as part of the expansion project of El Palito Refinery. The system produces low, medium and high octane gasolines by blending seven main components: FCC gasoline (catalytic cracking), alkylates (olefin alkylation), reformed gasoline (reformation of olefins and paraffin waxes), heavy naphtha (fractionated from crude), FR naphtha (lower boiling point), natural gasoline (natural gas condensation), and tetramethyl lead additives, ink, antioxidants and inhibitors.

Scope:

| Cost estimates | Detail engineering | Procurement |

Scheme:
Professional fees + reimbursable expenses

Location:
El Palito, Carabobo state, Venezuela

Client:
Foster Wheeler of Venezuela / Llanoven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 34,107
Heavy crude refining
Orimulsion® Plant, Venezuela

2003 - 2006

Design and construction of a plant for production of 125,000 BPD of Orimulsion® from bitumen from the Morichal area, consisting of a Diluent Recovery unit (naphtha), which separates the diluted bitumen to obtain diluent and dry bitumen, and an Orimulsion® Formation unit, which prepares a blended solution that is combined with water to obtain Orimulsion®, together with all the industrial services required for their operation. Includes review and validation of the basic engineering delivered by the client and detail engineering for fabrication and construction, along with support for equipment and materials procurement.

Scope:
- Review of basic engineering
- Detail engineering
- Procurement
- Construction
- Training of operations and maintenance staff
- Start-up, commissioning and operation of the plant to guarantee tests

Scheme:
- EPC Lump Sum

Location:
Morichal, Monagas state, Venezuela

Client:
Orifuels Sinoven S.A. (SINOVENSA)

Project in figures:
- Man-hours of management, engineering and procurement services: 350,000
- Man-hours of construction management: 150,000
- Man-hours of construction labor: 3,300,000
- Man-hours with no lost-time accidents: 3,300,000

Petrozuata Crude Upgrader Restoration, Venezuela

July 2002 - October 2003

Detail engineering of the new Waste Water Treatment, Acid Water Stripper, Spent Caustic Treatment, Raw Water Treatment and Demineralization plans, and modifications to Crude unit, support for local and international procurement of equipment and materials, and construction management.

Scope:
- Detail engineering
- Assistance for procurement
- Construction management

Scheme:
- Professional fees + reimbursable expenses

Location:
Jose, Anzoátegui state, Venezuela

Client:
Petrozuata: strategic association between Petróleos de Venezuela S.A. and ConocoPhillips of the United States

Project in figures:
- Man-hours of execution: 57,783
Hamaca Downstream Crude Upgrader Complex, Venezuela

2000 - 2004

Construction of a crude upgrader designed to handle 190,000 BPD of extra heavy 8° API oil to produce 180,000 BPD of upgraded 25° API crude, and approximately 25% of vacuum bottoms for placement on the international market. Includes the following units: Heavy Crude Dehydration, and Vacuum Distillation of 180,000 BPD, whose engineering and 3D modeling was totally executed in Venezuela; Delayed Coker, Hydrotreatment, Gas Treatment, Hydrogen Production, Sulfur Recovery, Sour Water Stripper, Amine Recovery, and all auxiliary storage facilities, raw and waste water treatment, relief systems, electrical substations and power distribution, and all service systems. Construction milestones include heavy equipment lifting: coker drums (340 MT) and their support platforms (450 MT each), vacuum tower (674 MT), hydroprocessing reactor (890 MT) and flare over 150 m high. The project received special recognition for accumulating over 12.7 million man-hours with no lost-time accidents during construction phase. Project executed in association with Fluor Daniels.

Scope:

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Client:

Petrolera Ameriven S.A.: strategic association between Petróleos de Venezuela S.A., ChevronTexaco and ConocoPhillips of the United States

Project in figures:

Man-hours of engineering: 387,000
Man-hours of procurement: 107,000
Man-hours of construction management: 3,100,000
Man-hours of construction labor: 39,000,000
Peak of 9,500 workers (2,000 of inelectra)
Management of 142 subcontracts

Location:

Jose, Anzoátegui state, Venezuela
Residual Water Treatment and Intermediate Product Storage Units, Venezuela

December 1998 - October 2001

Engineering, procurement and construction of an API separator, three DAF (Dissolved Air Flotation) units, two concrete aeration tanks, two clarifiers, an equalization tank and four additional metal tanks for the Waste Water Treatment unit, and development of the electromechanical facilities, equipment, instrumentation and fire-protection systems for the storage yard of the Intermediate Products Storage unit formed by 11 metal storage tanks for diluted crude, diluent, NDHT, flushing oil, off-specification products and residues built by SINCOR-CBI. Project included in the scope of the SINCOR Heavy Crude Upgrader in the Jose Petrochemical Complex.

Scope:
- Engineering
- Procurement
- Construction
- Commissioning
- Assistance with commissioning

Scheme:
EPC Lump Sum

Location:
Jose, Anzoátegui state, Venezuela

Client:
CONTRINA / Sincrudos de Oriente C.A. (SINCOR): strategic association of Petróleos de Venezuela S.A., Total of France, and Statoil of Norway

Project in figures:
Man-hours of execution: 164,516

Cerro Negro Downstream - Phase I, Venezuela

March 1997 - May 1998

Front end loading of a heavy crude upgrader complex with capacity to process 112,800 BPD of synthetic crude from 8° API to 16° API and convert it into commercial products for conventional refineries in the US Gulf Coast. Includes installation of Distillation and Crude Recovery, Delayed Coker, Naphtha Hydrotreatment plants, and auxiliary and service units. Project executed in association with M.W. Kellogg.

Scope:
- Basic engineering
- Construction

Scheme:
Professional fees + reimbursable expenses

Location:
Jose, Anzoátegui state, Venezuela

Client:
Operadora Cerro Negro (OCN): strategic association formed by Petróleos de Venezuela S.A., ExxonMobil of USA and Veba Oel of Germany

Project in figures:
Man-hours of execution: 12,995
VEHOP - Petrozuata Downstream, Venezuela

July 1996 - September 1998

Front end loading of VEHOP-Petrozuata Downstream project, developed jointly by Maraven-Conoco, with the objective of building and operating facilities with capacity to produce 120,000 BPD of heavy crude from the Zuata area in the Orinoco Belt, and upgrade it into commercial products. Includes project execution plan (contracting strategy, programming, cost control, procurement plans and construction); identification and development of detail engineering for critical items such as site preparation, temporary electrical feed, offsites piping, handling of products before completion of plant and main electrical substation; geophysical and seismic studies; preparation of bidding packages for EPC contracts. Project executed in association with M.W. Kellogg.

Scope:
Basic engineering
Detail engineering
Geophysical and seismic studies
Preparation of bidding packages

Scheme:
Professional fees + reimbursable expenses

Location:
Jose, Anzoátegui state, Venezuela

Client:
Petrozuata: strategic association between Petróleos de Venezuela S.A. and ConocoPhillips of the United States

Project in figures:
Man-hours of execution: 138,896

Orimulsion® EPM-2 / EPM-3 Manufacture Plants, Venezuela

August 1990 - November 1990

Basic engineering for Orimulsion® preparation units and 14° API-Diluted Solvent Recovery units (crude 8° API + kerosene), with a capacity of 100,000 BPD each, with facilities for desalting and dehydration of crude utilizing existing equipment. Includes auxiliary and industrial services units.

Scope:
Basic engineering

Scheme:
Professional fees + reimbursable expenses

Location:
Monichal, Monagas state, Venezuela

Client:
Bitúmenes del Orinoco S.A. (BITOR) / Lagoven S.A., subsidiaries of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 2,310
Hydrocarbon production facilities
Gas Facilities Debottlenecking/Modification, Venezuela

September 2004 - December 2006
Modification of Central Production Facilities (CPF) to increase extra heavy crude production by 20% from 120,000 BPD to 144,000 BPD, and expand gas handling capacity in anticipation of increases that impact the production volumes resulting from installation of new gas handling facilities, which increase dispatch capacity to 125,000 SCFD. inelectra, in association with WorleyParsons (WP), executed the detail engineering, after review of the basic engineering delivered by the client. In Caracas, inelectra executed the engineering for the CPF modifications and the new 16” gas pipeline from the CPF to the PDVSA Morichal gas station 20 km away. In Houston, WP executed the engineering for the gas plant.

Scope:
- Review of basic engineering
- Detail engineering
- Project management
- Procurement
- Construction management

Scheme:
Professional fees + reimbursable expenses + fixed fee

Location:
Morichal, Monagas state, Venezuela

Client:
Operadora Cerro Negro (OCN): strategic association between Petróleos de Venezuela S.A., ExxonMobil of the United States and Veba Oel of Germany

Project in figures:
- Man-hours of engineering and procurement management: 150,000
- Man-hours of construction management: 125,000
- Man-hours of construction labor: 1,000,000
- tons of metal structure: 600
- N° of units: 113 with a weight of 850 ton
- km 16” gas pipeline: 20
- km piping inside the CPF: 11
- m³ concrete: 1,500
- km cable: 16.5

Production Facilities (A & B Packages), Hamaca Upstream, Venezuela

August 2000 - July 2002
Review of basic engineering, development of detail engineering, procurement and construction of production facilities and flow lines, along with modification to existing facilities to produce, process and handle approximately 87,500 BPD of heavy crude diluted with Mesa crude, 5,000 BPD of water and 8 million of SCFD of gas included in the Production Development Phase, located in the Bare Operating Center (BOC), prior to the commercial stage after completion of commissioning of the Crude Upgrading unit (Hamaca Downstream Project) in Jose. Includes installation of five clusters, flow lines for diluent distribution and transfer of diluted crude, adaptation of the production facilities of the Bare Operating Center for crude dehydration and degasification, construction of storage tanks for diluted crude and transfer of crude to Jose, and adaptation of crude handling, reception and measuring facilities in the Oficina and Jose tank yards.

Scope:
- Review of basic engineering
- Detail engineering
- Procurement
- Construction
- Construction management
- Assistance with start-up

Scheme:
Professional fees + reimbursable expenses + fixed fee

Location:
El Tigre and Jose, Anzoátegui state, Venezuela

Client:
Petrolera Ameriven S.A.: strategic association between Petróleos de Venezuela S.A., ChevronTexaco and ConocoPhillips of the United States

Project in figures:
- Man-hours of execution: 366,149
Boquerón Gas Reinjection Plant,
Venezuela

October 1998 - February 2002

Engineering, assistance for procurement and construction for modifications to the existing infrastructure and installation of a new crude separation and treatment train of 50,000 BPD and the gas processing and compression system for injection of 150 million SCFD in the Boquerón field to optimize recovery of reserves and maximize commercial return, increasing production from the field over the contractual base volume of 1,288 m³/d of crude (8,100 BPD). In order to halt the rapid decline in the pressure of the reservoir, the project was executed in two phases. Phase I covered modifications to the existing infrastructure and early installation of a train for the gas injection system to handle a total capacity of 3,975 m³/d of crude (25,000 BPD) and 1.4 million m³/d of gas in normal conditions (50 million SCFD). Phase II covered the permanent crude production and gas injection infrastructure for incorporation of a new gas/crude separation train, the permanent dehydration and gas conditioning system; and expansion of injection capacity to 4.2 million m³/d of gas in normal conditions (150 million SCFD), and the crude storage capacity, giving a total capacity of 7,949 m³/d of crude (50,000 BPD). Project executed by the consortium formed by Parsons and Inelectra.

Scope:

- Conceptual, basic and detail engineering
- Assistance for procurement
- Construction management

Scheme:

Professional fees + reimbursable expenses

Location:

Boquerón field, Maturín, Monagas state, Venezuela

Client:

British Petroleum

Project in figures:

Man-hours of execution: 661,531
Cerro Negro Upstream, Venezuela

April 1998 - September 2000

Development of Cerro Negro field to produce in its final phase of completion 120,000 BPD of 8.2º API heavy crude (equivalent to 160,000 BPD of 16º API diluted crude). The project was executed in two phases. The first to produce 60,000 BPD from three clusters formed by 18 wells each and the treatment train, located in the Central Processing Station. The second phase comprised an additional cluster and a second treatment train to handle an additional 60,000 BPD. Included, in addition to the four clusters with a total of 72 wells, were all the crude and diluent interconnection lines, a 20 km-34.5 kV transmission line, a 34.5 kV substation, distribution substations, a 17 km-6” gas pipeline, a 12” line for reinjection of production water to the crude formation 20 km away, two separation trains for crude, water and gas, two pre-heating trains, two electrostatic desalting trains with supplementary fire, three fuel gas compressors, and three gas compressors for venting, system for pumping diluted crude to the Jose crude pipeline, with all the gas dehydration systems, storage tanks, water treatment, air and fire protection systems, emergency generation, control room, buildings, workshops and warehouses. Project executed by the consortium formed by inelectra and Parsons.

Scope:

| Detail engineering | Procurement | Construction |

Scheme:

EPC Lump Sum

Location:

Cerro Negro field, Monagas state, Venezuela

Client:

Operadora Cerro Negro (OCN): strategic association between Petróleos de Venezuela S.A., ExxonMobil of the United States and Veba Oel of Germany

Project in figures:

Man-hours of engineering, procurement management, support and management: 258,000
Man-hours of construction management: 129,000
Man-hours of construction labor: 1,510,800
Secondary Recovery by Water Injection, El Furrial Field - Phase I, Venezuela

September 1991 - December 1993
Basic and detail engineering, assistance with procurement, and construction management of a Water Injection plant, with a capacity of 400,000 BPD of water, for secondary recovery of 1,350 million barrels of crude in El Furrial field. Includes installation of a 4,300 lb/inch² high-pressure piping system and an effluent plant.

Scope:
Basic and detail engineering
Assistance for procurement
Construction management

Scheme:
Professional fees + reimbursable expenses

Location:
Jusepín, Monagas state, Venezuela

Client:
Lagoven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 278,930

Bachaquero Steam Injection Plant, Venezuela

May 1982 - November 1985
Construction of the HH8 and LL4 Steam Generation plants with an installed capacity of 6,700 and 11,800 t/d, respectively, and the fuel, power, water and steam distribution systems. Includes reconditioning and expansion of 37 flow stations and construction of an additional nine stations to facilitate handling of the increase in crude production from 56,000 BPD to 200,000 BPD as a result of steam injection, and collection and transport of the associated natural gas.

Scope:
Conceptual, basic and detail engineering
Procurement
Construction management

Scheme:
Lump Sum

Location:
Bachaquero, Zulia state, Venezuela

Client:
Maraven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 239,185
Gas production and processing
Western Cryogenic Complex (CCO),
Venezuela

December 2006 - March 2011

Construction of a cryogenic complex with a processing capacity of associated gas of 950 million SCFD, where a new centralized extraction scheme of NGL (70,000 BPD) is planned with state-of-the-art technology. At the start of operations, the complex will consist of two trains with nominal capacity of 475 million SCFD each, which will replace the existing extraction plants located in the Tía Juana 2 and 3 Compression plants, and in the Zulia Petrochemical Complex, NGL I and NGL II and Lamar Liquid. It also includes a reliable supply of ethane (35,000 BPD) with the specifications required by Pequiven. The CCO NGL Fractionating plant will fractionate the increase in NGL production from the NGL Extraction plant. Additions and modifications will be made in Pequiven - El Tablazo, La Salina Lake Terminal, Bajo Grande Fractionating and Storage plant, and Ulé LPG-2/3 plant to achieve the objectives of storage, fractionating and transport of the CCO products. In addition, the required interconnections will be made in the western gas networks for feeding and distribution of rich gas and residual gas (methane). Project executed by the TECINE Consortium formed by Technip and inelectra.

The project has been divided into the following blocks:
- Block I: two NGL extraction trains of 475 million SCFD each
- Block II: NGL fractionating train of 35,000 BPD of ethane
- Block III: executed by PDVSA
- Block IV: modifications of La Salina Lake Terminal
- Block V: modifications of Bajo Grande LPG plant
- Block VI: modifications in El Tablazo
- Block VII: modifications of Bajo Grande LPG Fractionating plant
- Block VIII: modifications of Ulé Fractionating plant

Scope:
- Review and modifications to basic engineering
- Detail engineering
- Procurement
- Construction
- Assistance with start-up

Scheme:
EPC Lump Sum

Location:
Ulé, Zulia state, Venezuela

Client:
PDVSA Gas S.A.

Project in figures:
Man-hours of estimated execution: 592,065
Man-hours of estimated management: 380,737
Man-hours of estimated engineering: 741,525
Man-hours of estimated procurement: 136,037
Man-hours of estimated construction management: 811,626
Man-hours of estimated labor: 16,700,000
Pisco Fractionating Plant Expansion, Peru

December 2006 - August 2008

Expansion of capacity of the Pisco Fractionating plant and its storage facilities from 55,000 BPD to 85,000 BPD, as consequence of incorporation of gas production from the Pagorení field, located in block 56 of Camisea, Peru. The Pisco plant processes the liquids from the Malvinas plant to prepare propane, butane, naphtha and diesel. The main facilities built are: Fractionating and Topping unit (plant N° 2), Pre-Refrigération and Refrigeration System; Vapor Recovery System (V RU) expansion; tank yard expansion with addition of two tanks for propane, two tanks for butane, one tank for diesel and one tank for naphtha; fire protection systems expansion, drainage, air, nitrogen, power generation, among others, and expansion of the Integrated Control System (PCS & SSS). Project executed by the Fractionating Plant Consortium (CPF) formed by the Peruvian company JJC, Schrader Camargo Ingenieros Asociados of Colombia, and inelectra.

Scope:

| Review of basic engineering |
| Detail engineering         |
| Procurement                |
| Construction               |
| Installation               |
| Precommissioning and commissioning |
| Start-up                   |
| Facilities performance test |

Scheme:

EPC Lump Sum

Location:

Pisco, Pisco province, Peru

Client:

Pluspetrol S.A.

Execution Center:

Buenos Aires / Bogotá

Project in figures:

Man-hours of execution: 1,631,275
Man-hours of engineering: 120,000
N° units to be purchased by the consortium: 50
N° units to assemble: 160
N° of instruments to be installed: 600
tons of piping: 2,500
km of power and control insulation cable: 320
km of instrumentation cable: 140
Eastern Cryogenic Complex (ACCRO) Expansion - Phases I and II, Venezuela

ACCRO I: December 1991 - December 1993
ACCRO II: January 1994 - July 1995

ACCRO I: increase NGL fractionating capacity from 70,000 to 100,000 BPD, and capacity of Propane Refrigeration unit by installing a second refrigeration train, and increase storage capacity by 250,000 barrels for pentane, natural gasoline and normal-butane, raising the global storage figure to 1,950,000 barrels. Includes construction of a Liquids Extraction plant in Santa Bárbara with a capacity of 4,090 million SCFD.

ACCRO II: construction of a third fractionating train, with a capacity of 35,000 BPD to increase NGL fractionating capacity, and a second train for processing natural gas in the Liquids Extraction plant in Santa Bárbara.

This was the first time that a Venezuelan company assumed the total commitment and execution risk for complex activities in the area of natural gas processing. The scope included review of basic engineering, detail engineering, national and international procurement, construction, assistance with commissioning, and guarantee tests. Project executed by the consortium formed by Technip, inelectra, and D.I.T.-Harris.

Scope:

| Review of basic engineering |
| Engineering                  |
| Procurement                  |
| Construction                 |

Scheme:

EPC Lump Sum

Location:
Jose, Anzoátegui state, Venezuela

Client:
Cорпован S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution ACCRO I: 584,977
Man-hours of execution ACCRO II: 355,662

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Gas Conditioning Plant (ACOGAS), Venezuela

April 1997 - July 1998

Detail engineering, procurement, construction and assistance with commissioning of modifications to the Gas Conditioning plant (ACOGAS) to increase gas processing capacity from 250 to 350 million SCFD, and to raise NGL production from 12,000 to 35,000 BPD. Includes installation, dismantling and modification of existing and new equipment without interrupting operations to minimize plant shutdown time. For this project, inelectra received the “Project of the Year” award from the Project Management Institute (PMI).

Scope:

| Detail engineering |
| Procurement        |
| Construction management |
| Assistance with commissioning |

Scheme:

EPC Lump Sum

Location:
Josepín, Monagas state, Venezuela

Client:
Lagoven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 177,522
Gas Compression Plants, Venezuela

April 1984 - December 1984

Detail engineering in the disciplines of piping and recipients for five modular gas compression plants located in Maracaibo Lake. Consists of 11 transportable modules, each with a compressor moved by gas turbine and with auxiliary systems for compressing the gas from the wells for reinjection to increase crude production in the operations in the area. Includes 11 control modules and related interconnection modules.

Scope:
Detail engineering

Scheme:
Professional fees + reimbursable expenses

Location:
Maracaibo, Zulia state, Venezuela

Client:
Corpoven S.A., Lagoven S.A., and Maraven S.A., subsidiaries of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 18,017
Maritime platform facilities
Living Quarter Platforms HA-ZAAP-C and HA-KU-H, Mexico

2005 - 2007

Engineering, procurement and construction of the HA-KU-H and HA-ZAAP-C living quarter platforms with capacity for 220 people each. The engineering was executed simultaneously in three of the project’s operating centers: Caracas, Houston and Gothenburg, with the inelectra offices in Caracas as central base. Included all the structural detail engineering of the jackets, platform, service systems and living quarter modules. Definition of the procurement strategy was based on financing, with Siemens being contracted to execute 70% of procurement based in Mexico City. Procurement of piping and architecture was managed from the Tampico operating center, and all the steel material was acquired from the Corpus Christi operating center. Procurement for the living quarter modules was executed directly by the Emtunga company in Gothenburg. The piles and substructure were fabricated in the Bay workshops in Corpus Christi. Piles activity was mechanically accepted by PEMEX before the established contractual termination date. The living quarter modules were shipped by sea from Sweden to the Pueblo Viejo Yard in Mexico where fabrication and interconnection of the superstructure was executed up to the load out and installation at sea stage. Assembly of mechanical, electrical equipment and instrumentation, installation of piping, cabling and connections were completed in Tampico, along with fabrication and installation of heliports and lifeboats. The platforms were positioned offshore in March-April 2007. Project executed by the Mexican joint venture Bay-inelectra.

Scope:

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<tr>
<td>Fabrication of piles, substructure, superstructure, living quarter modules, heliport and all systems required for their operation</td>
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<tr>
<td>Yard tests, load out and installation at sea</td>
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<tr>
<td>Technical assistance during installation of structures</td>
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<tr>
<td>Interconnections, commissioning, tests, and start-up of offshore operation in the KU and ZAAP fields</td>
</tr>
</tbody>
</table>

Scheme:

- Engineering, procurement, fabrication, load out and installation at sea: Lump Sum
- Offshore works: unit price
- Living quarter modules: EPC subcontract scheme

Location:

Campeche Bay, Gulf of Mexico, Mexico

Client:

PEMEX Exploration and Production (PEP)

Execution Center:

Caracas / Tampico / Monterrey

Project in figures:

Man-hours of execution: 3,739,440 shared by the yards in Pueblo Viejo, Corpus Christi, Tampico, Gothenburg, Caracas and Houston
Weight of the HA-KU-H platform: 6,318 ton
Weight of the HA-ZAAP-C platform: 6,457 ton
Hydrocarbon transport, distribution and storage
Central-Eastern Gas Pipeline, Colombia

January 1996 - December 1997

Construction of a gas pipeline to supply gas to thermoelectric power plants and urban grids that are located in the Central-Eastern region of Colombia. It consists of two lines with approximately 18 branches each.

Scope:
- Project management
- Engineering
- Procurement
- Construction

Scheme:
- Lump Sum

Location:
- Central-Eastern region, Colombia

Client:
- Ecopetrol S.A.

Execution Center:
- Colombia

Project in figures:
- Man-hours of execution: 20,795

Fuel Supply for the Andean Region (SUMANDES), Venezuela

April 1987 - June 1992

Review of basic engineering, execution of detail engineering, assistance with procurement and construction management of the storage and distribution system for refined products (high and medium gasoline, diesel, kerosene and Jet-A1 and residual) from Bajo Grande maritime terminal to San Lorenzo, Zulia state, and El Vigía, Mérida state. Includes the revamp of the Bajo Grande and San Lorenzo plants; the San Lorenzo-South Shore of Maracaibo Lake-El Vigia lake/land product pipeline; main pumping station in San Lorenzo; construction of El Vigia plant; construction and modifications of 53 storage tanks; design of 14 filling stations for tanker trucks, and modifications to the dock and loading platforms in Bajo Grande.

Scope:
- Review of basic engineering
- Detail engineering
- Assistance for procurement
- Construction management

Scheme:
- Professional fees + reimbursable expenses

Location:
- Andean region, Venezuela

Client:
- Maraven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
- Man-hours of execution: 321,376
Fuel Supply System for the Eastern Region (SISOR), Venezuela

March 1986 - May 1989

Basic and detail engineering, procurement and construction management of a fuel distribution system (high and medium gasoline, diesel and Jet-A1) from Puerto La Cruz Refinery to the new Fuel Storage and Distribution plants, located in the consumption centers of Puerto La Cruz, San Tomé, Maturín, Puerto Ordaz, Ciudad Bolívar and Puerto Ayacucho. Includes a network of approximately 590 km of product pipelines to interconnect the plants.

Scope:

| Basic and detail engineering |
| Procurement |
| Construction management |

Scheme:
EPC Cost plus

Location:
Southeast region, Venezuela

Client:
Corpoven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 571,339
NURGAS Gas Supply System / Altagracia-Morón section, Venezuela

November 1985 - February 1987

Basic and detail engineering, procurement management, cost estimate and preparation of bidding packages for the 275-km Altagracia-Morón section of the gas pipeline for transport of 950 million SCFD of natural gas, including three compression plants and 14 intermediate valve stations.

Scope:

- Cost estimate
- Preparation of bidding packages
- Basic and detail engineering
- Procurement management

Scheme:

| Professional fees + reimbursable expenses |

Location:

Guárico and Carabobo states, Venezuela

Client:

Corpoven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:

Man-hours of execution: 34,408

Alternate Supply for the Caracas Metropolitan Area (SAAM), Venezuela

March 1982 - December 1986

Construction of Carenero and Guatire Storage plants and a 66-km 16" product pipeline to optimize the fuel handling and transport system (high and medium gasoline, diesel and kerosene) and LPG in the Caracas Metropolitan Area. Includes, among other facilities, a tanker unloading maritime terminal in Carenero, product storage tanks, spheres for LPG storage, pumping system for transfer of products between tanks for sending to the truck filling stations, and LPG filling system for tanker trucks, semitrailers and cylinders (propane).

Scope:

- Basic and detail engineering
- Procurement
- Construction
- Construction management

Scheme:

| EPC Cost plus |

Location:

Carenero-Guatire, Miranda state, Venezuela

Client:

Lagoven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:

Man-hours of execution: 291,500
Petrochemical
Utilities and offsites for Borouge 2 Petrochemical Complex, Abu Dhabi

June 2007 - July 2009

Construction of utilities and offsites, including offplot infrastructure, onplot instrumentation and installation of communication systems, which are part of one of the five major packages for the Borouge 2 petrochemical plant expansion project. Includes technical assistance for the Engineering, Procurement and Construction that Técnicas Reunidas executes under the Lump Sum - Turnkey scheme.

Scope:

| Construction |
| Technical assistance for Engineering, Procurement and Construction |

Scheme:

Reimbursable

Location:

Abu Dhabi

Client:

Técnicas Reunidas S.A.

Execution Center:

Madrid

Project in figures:

Man-hours of execution: 30,794

 Phenols Complex, Saudi Kayan Petrochemical Complex, Saudi Arabia

2007 - 2009

Development of the new Phenols Complex located at the Saudi Kayan Petrochemical Complex, for the production of over 4,000,000 t/year of chemical products. Includes four units: Isopropylbenzene (Cumene), Phenol, Bisphenol and Phenols Recovery. Covers technical assistance for Engineering, Procurement and Construction executed by Técnicas Reunidas under the Lump Sum - Turnkey scheme.

Scope:

| Technical assistance for Engineering, Procurement and Construction |

Scheme:

Reimbursable

Location:

Jubail Industrial City, Saudi Arabia

Client:

Técnicas Reunidas S.A.

Execution Center:

Madrid

Project in figures:

Man-hours of execution: 57,689
Polyethylene I and II Plants, Colombia

February 2007 - January 2009

Recovery of the service factor in Polyethylene I and II plants in the Barrancabermeja Complex, to increase production in Polyethylene II from 9,263 LBH to 12,000 LBH, with an original design of 9,918 LBH. The Polyethylene I and II plants produce low-density polyethylene in autoclave reactors through a high-pressure process designed by Dow Chemical, with a design capacity of 57,000 MTY with a service factor of 91.3%.

Scope:
- Review of basic engineering
- Detail engineering
- Procurement
- Construction
- Training of operating and maintenance staff
- Support for start-up, commissioning, stabilization and performance tests

Scheme:
EPC Reimbursable

Location:
Barrancabermeja, Santander department, Colombia

Client:
Ecopetrol S.A.

Execution Center:
Bogotá

Project in figures:
- Man-hours of execution: 437,600
- Man-hours of project management: 24,882
- Man-hours of engineering: 43,180
- Man-hours of procurement: 10,000
- Direct man-hours of construction: 182,500
- Indirect man-hours of construction (management): 101,160

Polypropylene Plant Expansion, Venezuela

November 2002 - March 2004

Detail engineering, procurement and construction to increase the capacity of the Polypropylene plant, located in the Zulia Petrochemical Complex, from 86,000 MTY to 110,000 MTY. Includes design and installation of a series of silos, pumps, exchangers, compressor, vessels and miscellaneous services in accordance with the basic engineering executed by Mitsui Chemicals Inc. Project executed by the consortium formed by Z&P and inelectra.

Scope:
- Detail engineering
- Procurement
- Construction

Scheme:
EPC Lump Sum

Location:
El Tablazo, Zulia state, Venezuela

Client:
Polipropileno de Venezuela S.A. (PROPILVEN)

Project in figures:
- Man-hours of execution: 39,119
Propane - Propylene Separator,
Venezuela

July 1997 - June 1999

Technical-economic feasibility studies, conceptual engineering, cost estimate, basic and detail engineering, procurement and construction of the new Propane-Propylene fractionating facilities with processing capacity of 704.3 t/d to produce propylene grade polymer. Includes treatment system, deethanizer unit, product refrigeration, storage and shipping, industrial services and two refrigerated tanks. inelectra, as investor in the PROFALCA Propane-Propylene plant, participated from the start with definition and feasibility studies to start-up as general contractor on Lump Sum basis for detail engineering, supply of equipment and materials and construction.

Scope:

- Feasibility study
- Conceptual, basic and detail engineering
- Procurement
- Construction

Scheme:

EPC Lump Sum - Turnkey

Location:
Cardón, Falcón state, Venezuela

Client:
Propileno de Falcón C.A. (PROFALCA)

Project in figures:
Man-hours of execution: 301,682
Ethane Purification Plant, Venezuela

January 1995 - September 1996

Basic and detail engineering, procurement, construction and start-up of a new Ethane Recovery plant with design capacity of 300,000 MTY during 8,000 hours of operation per year, to meet demand for ethane from the Zulia Petrochemical Complex and start up the cracking facilities of the Olefins I / II Plants at maximum capacity, utilizing a minimum of propane to meet the requirements of propylene. Project executed by the consortium formed by Technip, D.I.T-Harris and inelectra.

Scope:
- Basic and detail engineering
- Procurement
- Construction
- Start-up

Scheme:
EPC Lump Sum

Location:
El Tablazo, Zulia state, Venezuela

Client:
Petroquimica de Venezuela S.A. (PEQUIVEN), subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 136,115

Methanol Plant Expansion - Phases I and II, Venezuela

Methanol I: June 1991 - February 1994
Methanol II: December 2006 - March 2010

Methanol I: construction of a methanol production plant with capacity of 726,000 MTY. In the 1990s, it was one of the world’s largest plants by size, and its production, as well as meeting local demand for methanol for production of oxygenates for gasolines, supplied North American markets. Project executed on an EPC Lump Sum basis by the consortium formed by Mitsubishi Heavy Industries Ltd. (MHI) and inelectra.

Methanol II: expansion of the existing unit from 750,000 to 1,600,000 MTY with addition of a new train similar to the existing one in 2010 when the plant will begin commercial operations. The project will incorporate a second methanol production line of 850,000 MTY in the facilities of Metanol de Oriente S.A. (MOTOR) in the “General José Antonio Anzoátegui” Industrial, Oil and Petrochemical Complex. Project executed on an EPC Lump Sum basis by the same consortium as for the original plant formed by Mitsubishi Heavy Industries Ltd. (MHI) and inelectra.

Scope:
- Basic and detail engineering
- Procurement
- Construction
- Assistance with commissioning

Scheme:
Methanol I: EPC Lump Sum - Turnkey
Methanol II: EPC Lump Sum - Turnkey

Location:
Jose, Anzoátegui state, Venezuela
Ethylene Oxide and Ethylenglicol Plant, Venezuela

1989 - 1992

Detail engineering, procurement and construction of the Ethylene Oxide and Ethylenglicol plant with capacity of 68,400 MTY of ethylene oxide; design and installation both on land and in Maracaibo lake of an 8" carbon steel pipeline to transport an ethylene-methane blend from the Zulia Petrochemical Complex to the plant in Punta Camacho, Zulia state. Project executed by the consortium formed by TPL and inelectra.

Scope:

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<td>Assistance with start-up</td>
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</tbody>
</table>

Scheme:

EPC Lump Sum

Location:

Punta Camacho, Zulia state, Venezuela

Client:

Productor de Alcoholes Hidratados C.A. (PRALCA)

Project in figures:

Man-hours of execution: 319,500

Client:

Metanol de Oriente S.A. (METOR) (Pequiven, Mitsubishi Gas Chemical, Mitsubishi Corporation and Empresas Polar)

Project in figures:

**Methanol I:**
- Man-hours of execution: 4,123,842

**Methanol II:**
- Man-hours of management, engineering and procurement: 260,052
- Man-hours of construction management: 134,640
- Man-hours of construction labor: 3,446,052
Olefins Plant Revamp - Phases I and II, Venezuela

June 1989 - April 1993

Phase I: basic and detail engineering, supply of materials and equipment, construction and assembly, readiness and assistance with start-up for the revamp of the Olefins plant of the Zulia Petrochemical Complex to increase production capacity of ethylene to 170,000 MTY. Includes the Class II cost estimate for the second phase of the project.

Phase II: basic and detail engineering, supply of materials and equipment, construction and start-up of modification of the Olefins plant to increase ethylene production capacity from 170,000 to 250,000 MTY, and propylene from 70,000 to 127,000 MTY, maximizing use of existing facilities to minimize investment costs.

Project executed by the consortium formed by M.W. Kellogg and inelectra.

Scope:

- Basic and detail engineering
- Procurement
- Construction
- Assistance with start-up

Scheme:

EPC Lump Sum - Turnkey

Location:

El Tablazo, Zulia state, Venezuela

Client:

Petroquímica de Venezuela S.A. (PEQUIVEN), subsidiary of Petróleos de Venezuela S.A.

Project in figures:

Man-hours of execution: 321,998
Man-hours of assembly and construction: 1,034,734
Assembly of steel structure: 3,000 MT
Number of reactors: 4
Number of towers: 8
Number of instruments: 1,600
Number of units: 67 majors
Number of heat exchangers: 41
Concrete poured: 2,300 m²
Laying of piping: 43 km
Lifting: 2 towers: 53 m high x 266 MT weight
62 m high x 263 MT weight
Polypropylene Plant, Venezuela

August 1988 - November 1991

Review of basic engineering, detail engineering, procurement and construction of Polypropylene plant, located in the Zulia Petrochemical Complex, including the Process unit, under license from Mitsui Petrochemical Industries LTD, with nominal production capacity of 70,000 MT of polypropylene, homo and copolymer pellets, based on 8,000 hours’ operation of a single production train. Includes services for plant and external facilities. Project executed by the consortium formed by TPL, D.I.T-Harris and inelectra.

Scope:
- Review of basic engineering
- Detail engineering
- Procurement
- Construction

Scheme:
EPC Lump Sum

Location:
El Tablazo, Zulia state, Venezuela

Client:
Polipropileno de Venezuela S.A. (PROPILVEN)

Project in figures:
Man-hours of execution: 450,000

BTX Aromatics Complex, Venezuela

June 1987 - October 1990

Execution of review/completion of basic engineering, detail engineering, procurement management and construction management for revamp of the Hydrotreatment and Catalytic Reformation units of El Palito Refinery to increase processing capacity of virgin naphtha from 6,500 to 9,500 BPD and the installations of new facilities for the production of Benzene, Toluene and Xilene. Includes construction of the following units: Aromatics Extraction and Fractionating with sulfolane; Xylene Fractionating; Xylene Isomerization (ISOMAR) and Thermal Hydrodealkylation (THDA); modification of Catalytic Hydrotreatment and Reformation units and auxiliary facilities. Project executed by the consortium formed by M.W. Kellogg and inelectra.

Scope:
- Review and completion of basic engineering
- Detail engineering
- Assistance with procurement
- Construction management

Scheme:
Professional fees + reimbursable expenses

Location:
El Palito, Carabobo state, Venezuela

Client:
Corpoven S.A., subsidiary of Petróleos de Venezuela S.A.

Project in figures:
Man-hours of execution: 561,181
Power generation and transmission
Lares Thermoelectric Plant, Portugal

November 2007 - November 2008

Basic and detail engineering for a 800 MW capacity combined cycle, which integrates the use of two fuel systems and the steam from the combustion to increase by 50% the power generating capacity using simple cycle (a single gas or fuel oil), one on gas or fuel oil turbine base and another on steam turbine base (using water). Includes the Power Island (PI) and Balance of Plant (BOP), in the disciplines of civil, piping, mechanical design, electricity, instrumentation and control. Contracted by the Spanish firm Empresarios Agrupados (EA), specialist in development of thermoelectric power plants, which in turn has been contracted by General Electric & Cobra and Energia de Portugal (EdP).

Scope:
Basic and detail engineering

Scheme:
Lump Sum

Location:
Lares, Figueira da Foz, Coimbra district, Portugal

Client:
Empresarios Agrupados (EA)

Execution Center:
Bogotá

Project in figures:
Man-hours of execution: 43,854

Green Dragon Thermoelectric Plant, Dominican Republic

February - May 2009

Dimensioning of the plant and definition of the number of units, modules criteria and start-up plan. Selection of the most suitable technology for the main systems and equipment; development of conceptual engineering of the project, including general implantation plan, dimensioning of main equipment and definition of the main design criteria; and development of cost estimate and financial model of the project, risks analysis and project execution plan.

Scope:
Conceptual engineering

Scheme:
Lump Sum of professional fees + reimbursable expenses

Location:
Punta Catalina, Peravia province, Dominican Republic

Client:
Vicini Group

Execution Center:
Panamá

Project in figures:
Man-hours of execution: 5,467
Mohammedia Thermoelectric Power Plant, Morocco

September 2007 - July 2008
Detail engineering for a new thermoelectric plant of 3x100 MW, in simple cycle, auxiliary equipment, treatment of liquid fuel and water, infrastructure and services, together with the interconnections for water, fuels and drainage with the old Mohammedia Power Plant and power output in 225 KV by underground channel to the electricity substation of the Office Nationale d’Electricite. Includes detail engineering in the disciplines of civil, tubing, electricity, instrumentation and telecommunications.

Scope:
Detail engineering

Scheme:
Lump Sum

Location:
Casablanca, Mohammedia, Morocco

Client:
Socain, member of the Socain/GE France consortium

Execution Center:
Caracas

Project in figures:
Man-hours of execution: 43,000
“José de San Martín” Thermoelectric Power Plant, Argentina

October 2006 - July 2009

Engineering, design, fabrication, procurement, construction, erection, start-up and commissioning of the 800 MW combined cycle along with related infrastructure and services. Project executed by Siemens and Consorcio Construcciones Térmicas S.A. formed by Electroingeniería and inelectra.

Scope:
- Basic and detail engineering
- Procurement
- Construction
- Start-up
- Operating authorization

Scheme:
EPC Lump Sum

Location:
Timbues, Santa Fe province, Argentina

Client:
Termoeléctrica “José de San Martín”

Execution Center:
Buenos Aires

Project in figures:
Man-hours of management, engineering, procurement and construction management: 250,000
Man-hours of direct labor (estimated): 3,243,855

Termobarrancas Thermoelectric Power Plant, Venezuela

February 2006 - June 2007

Detail engineering, procurement and construction of a thermoelectric power plant with a gas turbogenerator and related 230 kV substation, initially equipped with a GE turbogenerator model 7FA with capacity of 171 MW (ISO) and auxiliary systems with provisions for expansion to two turbogenerators and combined cycle. Interconnection of facilities to the National Electric System by 1.7 km line of approximately 230 kV, with 300 MW transport capacity, in single triad, and expansion of neighboring CADAFE Barinas IV substation. Includes design and construction of buildings for the medium voltage electricity substation, control room, spare parts warehouse, control house of the 230 kV substation, administrative and general service buildings, maintenance workshop and fire station. The plant uses fuel gas from the Repsol YPF Barrancas field. Project executed by the consortium formed by Socoin and inelectra.

Scope:
- Detail engineering
- Procurement of equipment, except turbogenerator and main transformer
- Supply of bulk materials
- Construction and installation
- Start-up

Scheme:
EPC Lump Sum, including transport of turbogenerators and their auxiliary equipment from the United States, acquired by Termobarrancas

Location:
Obispos, Barinas state, Venezuela

Client:
Termobarrancas, subsidiary of Repsol YPF

Project in figures:
Man-hours of management, engineering and procurement: 98,400
Man-hours of construction management: 50,000
Man-hours of construction labor: 1,000,000
Termozulia Thermoelectric Power Plant, Venezuela

January 2002 - October 2003

Completion of conceptual engineering, and basic and detail engineering, and construction management of two turbogenerators and their auxiliary systems, and conceptual and basic engineering for a new 1,400 MW plant to supply electricity using steam turbogenerators in combined cycle, installed on the western shore of Maracaibo lake. Includes all detailed engineering for the open and closed cycles quality assurance and coordination of construction in the specialties of civil, mechanical and electricity; preparation of purchase packages for major and auxiliary equipment for the first two units and contracting packages for works for the Power Island and the Balance of Plant. The project included works inspections and equipment tests.

Scope:
- Completion of conceptual engineering
- Basic and detail engineering
- Assistance with procurement
- Construction management

Scheme:
Professional fees + reimbursable expenses

Location:
La Cañada de Urdaneta municipality, Zulia state, Venezuela

Client:
C.A. Energía Eléctrica de Venezuela (ENELVEN)

Project in figures:
Man-hours of execution: 55,720

Termocentro Thermoelectric Power Plant, Colombia

December 1998 - October 2000

Conversion to combined cycle of the Termocentro Thermoelectric Plant to take advantage of the energy from the tail gases from the two 110-MW gas turbines, of the open cycle of the plant, to feed a new 100 MW steam turbine, by means of utilization of two heat recovery steam generators (hrsg), of two pressure levels (1300 psia / 950°F and 80 psia / 560°F), with capacity for 8 x 105 lb/h steam production. To improve the efficiency of the plant its generating capacity was expanded and a generator was adapted in each gas unit in order to receive the hot gases and combine them with water to convert them into steam at pressure to feed a new turbine, which generates an additional 100 MW. Executed by the inelectra Parsons-General Electric consortium.

Scope:
- Detail engineering
- Procurement
- Construction
- Start-up

Scheme:
Lump Sum - Turnkey

Location:
Corregimiento Puerto Olaya, Cimitarra municipality (Santander), Colombia

Client:
Isagen S.A.

Execution Center:
Bogotá / Caracas

Project in figures:
Man-hours of execution: 1,009,530
La Sierra Thermoelectric Power Plant, Colombia

December 1998 - October 2000
Conversion to combined cycle of La Sierra Thermoelectric Plant, with the addition of a steam cycle to the existing plant. The installations designed and built take advantage of the energy from the tail gases of the two gas turbines of 170 MW of simple cycle of the plant, to feed a new 210 MW steam turbine, by means of the utilization of two heat recovery steam generators (hrsg) of three pressure levels (800 psia / 1050°F, 360 psia / 1050°F and 60 psia / 600°F) with capacity for 1.2 x 106 lb/h of steam production. This higher efficiency gives it privilege with respect to the other Colombian thermal plants, guaranteeing a higher average dispatch throughout the year. Executed by the inelectra Parsons-General Electric consortium.

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<td>Start-up</td>
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Scheme:

Lump Sum - Turnkey

Location:
Puerto Nare, Antioquia department, Colombia

Client:
Empresas Públicas de Medellín

Execution Center:
Bogotá / Caracas

Project in figures:
Man-hours of execution: 1,405,725

IPP Cardón Refinery, Venezuela

January 1994 - August 1996
Detail engineering, procurement, construction, tests and start-up of the Steam and Power Generation plant of Cardón Refinery. Includes engineering, procurement and construction of the 115 kV substation and 115 kV double-circuit transmission lines, which interconnect the Amuay and Cardón refineries with the National Electricity System through the CADAFE Punto Fijo Substation, together with installation of three 100-MW turbogenerators and four 40-ton/h boilers. Project executed by the consortium formed by Raytheon/United Engineers and inelectra.

Scope:

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</table>

Scheme:

EPC Lump Sum

Location:
Cardón, Falcón state, Venezuela

Client:
GENEVAPCA, subsidiary of C.A. La Electricidad de Caracas

Project in figures:
Man-hours of execution: 112,722
Planta Centro Thermoelectric Power Plant, Unit N° 5, Venezuela

January 1980 - December 1984
Conceptual study, basic and detail engineering, procurement, project management and assistance during construction of the electromechanical expansion project of unit N° 5 of Planta Centro Thermoelectric Power Plant.

Scope:
- Conceptual study
- Basic and detail engineering
- Procurement
- Project management
- Assistance with construction

Scheme:
Lump Sum

Location:
Morón, Carabobo state, Venezuela

Client:
C.A. de Administración y Fomento Eléctrico (CADAFE)

Project in figures:
Man-hours of execution: 107,072

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Power and Steam Generation and Distribution System, Venezuela

May 1978 - November 1980
Basic and detail engineering and supervision of installation of the Steam Process Station, with a production capacity of 1,000,000 t/year of alumina (aluminum oxide), and electrical building and adjacent areas. The Steam Station consists of four steam generators of 200 t/h 245°C and 16 barg each and a machine room; the electrical building covers the 115 kV, 13.8 kV and 4.16 kV substations, administrative offices and control room; and the adjacent areas including water treatment plant, treated water tanks, cooling towers, tanks and pumping stations for heavy and light fuel, and piping bridges.

Scope:
- Basic and detail engineering
- Installation
- Construction

Scheme:
Professional fees + reimbursable expenses

Location:
Puerto Ordaz, Bolivar state, Venezuela

Client:
Interamericana de Alúmina C.A. (INTERALÚMINA)

Project in figures:
Man-hours of execution: 96,300
Tacoa Thermoelectric Power Plant, Unit N° 9, Venezuela

March 1978 - December 1983

Supply and detail engineering, procurement, construction management, planning, preparation of specifications for equipment and services, coordination of engineering and review of manufacturers plans for installation and start-up of one 430-MW steam turbogenerator in the “Ricardo Zuloaga” Power Generation Complex, as part of the expansion of the Tacoa Thermoelectric Plant.

Scope:

- Procurement
- Construction supervision
- Installation and start-up

Scheme:
Lump Sum

Location:
Arrecifes, Vargas state, Venezuela

Client:
C.A. La Electricidad de Caracas

Project in figures:
Man-hours of execution: 580,000
Planta Centro Thermoelectric Power Plant, Venezuela

March 1977 - July 1981

Feasibility study, preliminary design, basic and detail engineering, procurement and construction management of the second stage of Planta Centro Thermoelectric Power Plant with approximately 2,000 MW capacity. Includes installation of three 400-MW units; construction of water cooling system with 70 m³/sec flow, and basic design of the plant, from conception of thermal cycle, selection of main characteristics of equipment and facilities, preparation of technical, commercial and administrative specifications for bidding for the steam turbines groups and generators, and evaluation of bids. During execution, inelectra was advised by the Société de Traction et d’Electricité of Belgium.

Scope:

- Feasibility study
- Basic and detail engineering
- Procurement
- Construction management
- Project management

Scheme:

Lump Sum

Location:

Morón, Carabobo state, Venezuela

Client:

C.A. de Administración y Fomento Eléctrico (CADAFE)

Project in figures:

Man-hours of execution: 229,632

Tacoa Thermoelectric Power Plant Expansion, Units N° 7 and 8, Venezuela

September 1974 - September 1980

Feasibility study, basic and detail engineering, procurement and construction of two 400 MW steam power generation units as part of the Tacoa Thermoelectric Plant expansion project. Includes preparation of design criteria, technical specifications of equipment, bid evaluation, administration and follow-up of purchase orders, inspection of equipment during fabrication, transport, assembly and start-up; construction of the building for the new plant, design of systems for the generating units, water cooling supply system, mechanical workshops, tanks, water treatment plants, unloading facilities, fuel storage and handling, together with disembarkation facilities for heavy equipment. Project executed jointly with the Société de Traction et d’Electricité of Belgium.

Scope:

- Feasibility study
- Basic and detail engineering
- Procurement
- Construction
- Assistance with construction
- Inspection
- Start-up

Scheme:

EPC Lump Sum

Location:

Arrecifes, Vargas state, Venezuela

Client:

C.A. La Electricidad de Caracas

Project in figures:

Man-hours of execution: 419,690
**El Tablazo Thermoelectric Power Plant, Venezuela**

**January 1972 - December 1975**

Study of electricity supply and steam for comparative analysis of the various generation alternatives, considering the integration of the Zulia Petrochemical Complex to the CADAFE Western System; study of fuel utilization to evaluate the total fuel requirements for the production plants and services of the Complex; conceptual, basic and detail engineering and procurement for the Electricity Generation plant, which comprises installation of two groups of 40-MW steam turbogenerators and two 475,000 lb/h boilers; detail engineering and assistance with construction of El Tablazo Thermoelectric Power Plant, including location and redefinition of major and minor equipment; design of piping for interconnection of equipment; laying and connection of power cables and preparation of layout plans and connection of control cables for remote control and protection devices; design of main buildings; preparation of specifications for construction and assembly, and construction management. The design of El Tablazo Thermoelectric Plant was one of the largest electromechanical projects executed in Venezuela at that time.

**Scope:**

- Feasibility studies
- Conceptual, basic and detail engineering
- Procurement
- Project management
- Construction management
- Inspection

**Scheme:**

Lump Sum

**Location:**

El Tablazo, Zulia state, Venezuela

**Client:**

Instituto Venezolano de Petroquímica / Kellogg Pan American Corporation

**Project in figures:**

Man-hours of execution: 80,000

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**El Valle Tunnel Electrical System, Venezuela**

**August 1968 - November 1968**

Detail engineering for the electrical system of El Valle tunnel of approximately 1,250 m per lane. Includes five substations, control room for lighting power supply, stop lights, alarms, communications systems, and their control systems, such as carbon monoxide detection and photoelectric cells, among others. This project gave impulse to the creation of *inectra*.

**Scope:**

Detail engineering

**Scheme:**

Professional fees + reimbursable expenses

**Location:**

Caracas, Capital district, Venezuela

**Client:**

Ministry of Public Works

**Project in figures:**

Man-hours of execution: 200
Infrastructure / basic industries
Canalization of Guaire River, Section 2, Venezuela

January 2007 - September 2009
Construction of a concrete channel along a 1-km 28-m wide section, with an average wall height of 5.75 m between La Línea sector (Petare) and Pablo VI suburb (El Llanito) in Caracas. Includes stabilization of 1 km of slopes along the channel, which is used as final wall, according to the design used for the first time in Venezuela. Includes topographic survey and earthworks for slope stabilization on left bank by means of a contention wall with anchors; construction of a coffer dam to divert the waters during the works and excavations to reach the bottom levels required to pour the concrete into the channel. To initiate construction of drainage channel and bed, geotextile material was used to drain the subpressures in the walls and river bed. Includes filling in the back part of the walls, road recovery and reforestation.

Scope:
- Construction

Scheme:
- Unit prices + escalation

Location:
- Caracas, Miranda state, Venezuela

Client:
- People’s Ministry for the Environment

Project in figures:
- Man-hours of execution: 750,000

Materials Transport System, Los Pijiguaos Bauxite Mine, Venezuela

September 1989 - April 1992
Review of basic engineering, detail engineering of all the system, fabrication of structures, civil works and erection of structures and equipment for transport of bauxite mineral production by railway from “Pie de Cerro” Storage Yard in Los Pijiguaos to El Jobo site on the banks of the Orinoco river, from there by river to Puerto Ordaz.

Scope:
- Review of basic engineering
- Detail engineering
- Procurement
- Construction

Scheme:
- EPC Lump Sum

Location:
- Los Pijiguaos, Bolívar state, Venezuela

Client:
- Bauxiven

Project in figures:
- Man-hours of execution: 91,400
Steel Pipe Manufacturing Plant Expansion, Venezuela

December 1987 - September 1990

Detail engineering in the disciplines of civil, electrical, mechanical, and instrumentation and control works of the steel pipe plant buildings for the expansion of the Siemens-Martin steelworks and steel pipe factory. Includes procurement management. The buildings were designed to utilize only national steel products, especially the SIDOR line; as a result, 6,000 tons of steel structures were replaced with local material.

Scope:

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</table>

Scheme:
Professional fees + reimbursable expenses

Location:
Puerto Ordaz, Bolívar state, Venezuela

Client:
CVG SIDOR C.A.

Project in figures:
Man-hours of execution: 63,200
Aluminum Smelter - V Line Expansion, Venezuela

July 1986 - July 1989

Study to check reliability of the 115 kV power supply during review of the basic engineering of the V Line Cells of the Venalum Aluminum Smelter. Analysis of the 115 kV electrical system. Alternatives were proposed to improve the reliability of the power supply by expanding the transmission system. Includes basic and detail engineering.

Scope:

- Reliability study
- Basic and detail engineering

Scheme:

Professional fees + reimbursable expenses

Location:

Puerto Ordaz, Bolivar state, Venezuela

Client:

Venalum

Project in figures:

Man-hours of execution: 147,102
Mass transportation systems
Central Region Rail System, Puerto Cabello - La Encrucijada section, Venezuela

June 2002 - December 2005

Coordination of studies and projects for development of the 108 km rail corridor connecting Puerto Cabello, the country’s main port, with the industrial and agricultural centers of Valencia, Maracay, San Juan de los Morros, and Calabozo, and connection with Cabruta, the main port of the Orinoco-Apure corridor. This section has been conceived as a modal transport system for cargo and passengers with seven passenger stations, two intermediate cargo ports and an integrated system equipped with electric locomotives and trains.

Scope:

- Coordination of studies and projects

Scheme:

- Professional fees + reimbursable expenses

Location:

- Puerto Cabello - La Encrucijada, Carabobo and Aragua states, Venezuela

Client:

- FERROCAR

Project in figures:

- Man-hours of execution: 297,016
Caracas - Tuy Medio Railway, Venezuela

June 1996 - December 1997
Technical management services to represent FERROCAR with the companies responsible for engineering, procurement and construction of the Caracas-Tuy Medio Railway. Includes engineering approval, coordination of in-factory inspection and civil works, contract management, project control, support and advisory services to start of operation of the railway.

**Scope:**
- Project management
- Approval of engineering
- Coordination of inspection
- Contract management
- Project control
- Support and advisory services up to start of operations

**Scheme:**
Professional fees + reimbursable expenses

**Location:**
Caracas - Tuy, Miranda and Aragua states, Venezuela

**Client:**
FERROCAR

**Project in figures:**
Man-hours of execution: 155,221

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Professional services for Lines 1, 2, 3 and 4, Metro de Caracas, Venezuela

November 1983 - December 2002
Contract management and design inspection, assembly, installation, start-up and tests services for control and signaling equipment for automatic protection of trains on Lines 1 and 2, maneuvers yard, and wagons. Includes construction management of electromechanical works of Lines 1, 2 and 3; maintenance of control equipment for automatic protection of trains, maneuvers yard and wagons; basic engineering for rail systems, electrification for traction and control of trains of Line 3 Plaza Venezuela-San José-El Valle-La Rinconada; advisory services on control of the project construction; specialized technical assistance in the areas of control of train maintenance projects and fabrication of new wagons, and assistance services for Line 4 in the areas of rolling stock and control of trains.

**Scope:**
- Management of contracts
- Design inspection, assembly, installation, start of service and tests
- Construction management
- Basic engineering
- Technical assistance

**Scheme:**
Professional fees + reimbursable expenses

**Location:**
Caracas - Tuy, Miranda and Aragua states, Venezuela

**Client:**
FERROCAR

**Project in figures:**
Man-hours of execution: 3,053,383
Lines 1 and 2 Caricuao-Centro/Chacaito-Palo Verde, Equipment Inspection - Stage I, Metro de Caracas, Venezuela

October 1978 - August 1983

Detail engineering, procurement, inspection and construction management. Total inspection of supply contracts, installation and equipment tests on the Propatria-Chacaito section. Technical assistance and construction management, project control and cost estimates for all civil works and equipping of Lines 1 and 2 Caricuao-Centro/Chacaito-Palo Verde.

Scope:

- Engineering
- Procurement
- Construction management
- Project management
- Inspection

Scheme:

Professional fees + reimbursable expenses

Location:

Caracas, Capital district, Venezuela

Client:

C.A. Metro de Caracas

Project in figures:

Man-hours of execution: 591,620