

Title: Cerro Negro. Engineering, Procurement, Construction and Start-Up (EPC) for a 122 MBSD Heavy Oil Upgrader Project.

Date: 1998-2001

Scope: Engineering, Procurement, Construction, Start-Up (EPC)

Location: Jose, Anzoátegui State, Venezuela.

About Operadora Cerro Negro, S.A:

The Cerro Negro Operator (OCN) is a strategic partnership between Petróleos de Venezuela SA, ExxonMobil of UAE and Veba Oel of Germany, formed through an agreement signed in 1997. OCN performs oil production and processing activities on the Orinoco Belt, liquid-gas mix compression, separation and dehydration of crude oil, which is then transported through 300 km of pipeline to the upgrader located in Jose, to raise the quality of crude oil from 8.5 to 16.0 API.

Executive Summary:

Heavy oil upgrading facilities in Jose: design, procurement and construction of grass root facilities for upgrading 122,200 BPSD of 8.2°API extra heavy crude to produce approx. 109,800 15.2° API synthetic crude oil.

Facilities included: desalter / dehydrator: DRU designed by Foster Wheeler and DSU designed by Kellogg with a capacity of 157,804 BPSD of 16.1° API dco. delayed coker unit and gas plant: DCU designed by Foster Wheeler and Mobil to process 48,000 BPSD of 740° f distilled residue from Cerro Negro crude oil.

Production is 2,340 STPD of green coke. Naphtha hydrotreater unit and hydrogen pressure absorption unit. NHT is designed with Mobil Corporation technology to process 6,500 BPSD of untreated coker naphtha produced in a DCO amine regeneration unit and sour water stripping.

ARU is designed to regenerate 681 GPM in a standard condition of amine rich feed from the coker gas plant. NHT sour waters will be treated in SWS to remove h₂s and nh₃ and produce a stripped water stream and acid gas stream. Sulfur recovery and sulfur solidification unit. SRU based on Superclaus Technology, (trademark license from Stork Engineers & Contractors b.v.), to treat acid gas from ARU and SWS containing a total 114.0 lt/d of sulfur, and to produce 113.9 l/d of Sulfur product (recovery rate =99.9%) sws tankage: 2-dco storage tanks (559,300 barrels); 2-sco storage tanks (559,300 barrels); 1-diluent storage tank (257,500 barrels), ten buildings (technical and administrative).

Challenges:

- JV integrated by three companies, one Japanese (JGC) with two premises in simultaneous execution in Yokohama, Japan, one in Caracas and one at Jose, Venezuela.
- Interdisciplinary coordination due to the work execution scheme some in vertical Split and others in horizontal Split.
- Integration of design tools and 3D models
- Aligning two different cultures in the execution of a project, being the first experience of this kind with a Japanese company.
- Efficient and effective communications

Vepica Solutions:

- Dedicated lines of communication between Yokohama, Caracas and the site.
- Incorporation of external help in the formation of high performance work teams.
- Joint teamwork during the first phase of the project's implementation in Yokohama, Japan.
- Creation of models and a common database by the project's integrated team in Yokohama, Japan.
- Integration of the client's team with the project's teams at the different locations.

