START-UP
VENEZUELA
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Successful start-up of Comsigua HBI plant in Venezuela with ABB

BADEN-DAETTWIL, SWITZERLAND – Complejo Siderurgico de Guayana C.A. (Comsigua) of Venezuela has successfully started up its new hot briquetted iron (HBI) direct reduction plant in the state of Bolivar. The plant was officially inaugurated on October 30, 1998 by the president of Venezuela, Dr. Rafael Caldera Rodríguez.

For this project, ABB supplied the complete electrification package, including the variable frequency drives and control equipment. The greenfield plant is located south-east of Caracas, near Puerto Ordaz, on the Orinoco river, in a region rich in iron ore and natural gas and with an abundant supply of electrical energy.

The electro-mechanical installation as well as the commissioning and start-up of the electrical equipment has been carried out by the local ABB organisation. “ABB’s strong local support helps us to get quick and professional services, whenever we need them, “ states Comsigua’s Plant Manager Kota Hanao.

ABB key products

ABB engineered and supplied the 115 kV high-voltage substation, 13.8 kV switchgear, power transformers, 4.16 kV medium-voltage and 480 V low-voltage switchgear, most of the motors and drives for conveyor belts, compressors and pumps, power factor correction equipment, motor control centers, Advant OCS process control system and distributed controls.

Included in the scope of motors and drives are six 13.8 kV motors for the main air blower, the stack fan and the four process gas compressors, as well as 12 motors for the cooling water pumps.

Water transported from the nearby Orinoco River has to be pumped up to 45m mainly for the Burdenfeeders and briquetting machines.

Included are also variable frequency drives for the four briquetting machines.

The new-generation Advant OCS (Open Control System) consists of a family of computer-based units and a range of communications options, including field buses and local and wide area networks. These are combined to form powerful systems suitable for applications ranging from small machine control to total, plant-wide automation. “ABB offers an open standard solution, “ states Francisco Bitto, responsible for the process control at Comsigua. “I can find the best PC supplier on the market and connect any PC to the ABB Open Control System. And it is easy to program; most changes can be done online, without stopping the process.”

Other interesting information

HBI production in the plant, key components of which are a shaft furnace, gas reformer, process gas system and hot briquetting machine, plus heat recovery system and auxiliary handling systems for the ore, gas and water, stands currently at 350,000 tonnes. By the year 2000 Comsigua will reach its capacity of one million tonnes per year.

The raw material used for the production of briquettes are pellets and lump ore produced by CVG Ferrominera Orinoco and transported from the storage yards through a belt conveyor system and stored separately in bins. The final product, the briquetts, are quenched and loaded onto wagons to be finally transported to Palua Port for shipment to the international markets.

ABB drives systems at Comsigua

The hot briquetted iron produced at the new plant is a densified form of direct reduced iron (DRI), and is used as feedstock in electric arc furnace (EAF) and other steelmaking applications. In the Midrex production technology employed in Comsigua, iron oxide in pellet or lump form is reduced to high-purity DRI in a shaft furnace using natural gas as the reducing agent. Most of the HBI is for export sale, mainly to Mexico and the United States.

World-wide demand for HBI and DRI is increasing. It is also anticipated that in North America EAF steelmaking will continue to grow, and that new minimills will be built. At the same time EAF steelmakers are facing the prospect of less high-quality scrap being available as well as higher levels of impurities in scrap.

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