Improving the performance of asphalt plant components

by Ricardo Barbosa Damian, CIBER Equipamentos Rodoviários Ltda. (member of the Witgen Group), Brazil and Marcus Reis, ESSS, Brazil

Modern, efficient and innovative, CIBER is located in Porto Alegre, Brazil and has as its core business the manufacturing of and sale of machinery and equipment for road construction and maintenance.

Experimental development of portable asphalt plant components requires time and is an expensive process. In order to offer products with lower energy consumption and more compact dimensions, and that meet environmental regulations, CIBER chose CFX-5. This computational fluid dynamics software was developed to assist in analyzing many of the complex processes involved in asphalt production. These processes include combustion, solids drying, liquid and solid mixture, solid-air separation and filtration and pneumatic transport of particles.

Large quantities of dust are carried by the exhalation of combustion gases during the drying of aggregate matter inside the rotary dryer. This dust should be recovered for the bitumen production. During the drying of aggregate matter, the exhaustion of combustion gases is a fundamental role inside all plants in PETROBRAS-making Brazil one of the leading countries in oil industry technology. The CFD analysis within PETROBRAS is state-of-the-art.

PETROBRAS invests in fluid dynamics to study the heat and mass transfer that occur in chemical processes. PETROBRAS’ specialists analyze Newtonian and Non-Newtonian multiphase flow from all walk of life to improve their performance, reducing their energy losses, reducing their use of machinery and equipment for road construction and maintenance.

The successful consulting projects in collaboration with CFX Basic Engineering include the hydraulic study of geometry’s influence on the usage flow model in FCC (Fluid Catalytic Cracking) regenerator and analysis of several feed nozzle configurations in distillation columns (vacuum and pre flash towers).

PETROBRAS, a pioneer in the petroleum industry and one of the largest companies in South America, has recently completed a multi-year contract with ESSS in Brazil making CFX the official CFD tool within the company.

PETROBRAS was founded in October of 1953 to operate in the Brazilian oil sector. The company has become the country’s leader in the distribution of oil products and is internationally acknowledged as one of the largest major oil companies in the world today, leading the sector in the implementation of the most advanced technologies for oil production. PETROBRAS operates in a large number countries around the world.

CENPES, the PETROBRAS research center and SIX (Shale Industrialization Unit), uses and develops advanced technologies and is internationally renowned for its expertise. CENPES Basic Engineering and SIX play a fundamental role inside all plants in PETROBRAS-making Brazil one of the leading countries in oil industry technology. The CFD analysis within PETROBRAS is state-of-the-art.

CENPES invests in fluid dynamics to study the heat and mass transfer that occur in chemical processes. PETROBRAS’ specialists analyze Newtonian and Non-Newtonian multiphase flow from all walk of life to improve their performance, reducing their energy losses, reducing their use of machinery and equipment for road construction and maintenance.

The successful consulting projects in collaboration with CFX Basic Engineering include the hydraulic study of geometry’s influence on the usage flow model in FCC (Fluid Catalytic Cracking) regenerator and analysis of several feed nozzle configurations in distillation columns (vacuum and pre flash towers).

PETROBRAS chooses CFX

by Daniel Ribeiro, Gustavo Xavier and Marcus Reis, ESSS, Brazil

PETROBRAS, a pioneer in the petroleum industry and one of the largest companies in South America, has recently completed a multi-year contract with ESSS in Brazil making CFX the official CFD tool within the company.

After using CFX to design more compact equipment it was possible to decrease the size of an asphalt plant from three platforms to a single platform.

The maximum dust speed within the SE was not greater than 2 m/s, below the volumes for emissions. Experimental studies validated these results.

Inlet: A one-phase model with a variable density was used to model the FCC regenerator with fidelity, including the several internal hydrodynamic study of geometry’s influence on the usage flow model in FCC (Fluid Catalytic Cracking) regenerator and analysis of several feed nozzle configurations in distillation columns (vacuum and pre flash towers).

PETROBRAS chooses CFX

by Daniel Ribeiro, Gustavo Xavier and Marcus Reis, ESSS, Brazil

PETROBRAS, a pioneer in the petroleum industry and one of the largest companies in South America, has recently completed a multi-year contract with ESSS in Brazil making CFX the official CFD tool within the company.

PETROBRAS chooses CFX

by Daniel Ribeiro, Gustavo Xavier and Marcus Reis, ESSS, Brazil

PETROBRAS, a pioneer in the petroleum industry and one of the largest companies in South America, has recently completed a multi-year contract with ESSS in Brazil making CFX the official CFD tool within the company.

PETROBRAS chooses CFX

by Daniel Ribeiro, Gustavo Xavier and Marcus Reis, ESSS, Brazil

PETROBRAS, a pioneer in the petroleum industry and one of the largest companies in South America, has recently completed a multi-year contract with ESSS in Brazil making CFX the official CFD tool within the company.

PETROBRAS chooses CFX

by Daniel Ribeiro, Gustavo Xavier and Marcus Reis, ESSS, Brazil

PETROBRAS, a pioneer in the petroleum industry and one of the largest companies in South America, has recently completed a multi-year contract with ESSS in Brazil making CFX the official CFD tool within the company.