

OmegaLand Educator Industry

Residue Fluid Catalytic Cracking Unit

What is a Residue Fluid Catalytic Cracking Unit (RFCC) ?

The OmegaLand Educator is a comprehensive training system composed of three main modules:

- Principle Module, which focuses on learning the fundamentals and operational principles,
- Basic Unit Module, designed to master unit operations, and
- Industry Module, which allows users to learn industry-specific processes.

The Industry Module features a Residue Fluid Catalytic Cracking Unit (RFCC) model that operates within a dynamic simulation environment. It is designed to provide practical, hands-on training for plant operators.

The package includes (1) Realistic RFCC process model for dynamic simulation and (2) detailed training manual covering key topics such as: Process Overview, Process Flow, Operation and Control, Steady-State Operation, Non-Steady-State Operation, Abnormal Situation Handling. The RFCC model used in this product is based on a standard residue fluid catalytic cracking unit and has been simplified for training purposes. It includes all major stages - from atmospheric residue from the storage tank to product draw-off - allowing trainees to gain a comprehensive understanding of RFCC operations. While simplified, the model retains essential complexity to ensure effective training in realistic operational scenarios. This product is ideal for operator training programs in the refining industry, offering both foundational knowledge and situational practice in a safe, simulated environment.

Process Overview & Process Flow

■ Feedstock Options

Atmospheric Residue (AR) can be processed.

- Specific Gravity: 0.981
- Residual Carbon (wt%): 3.15

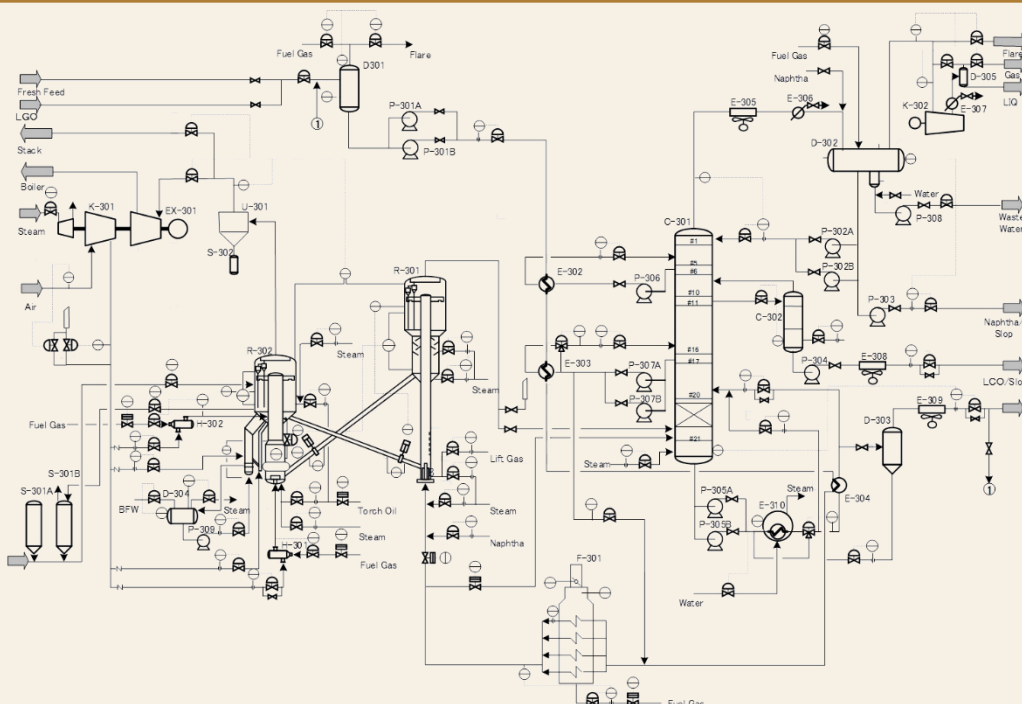
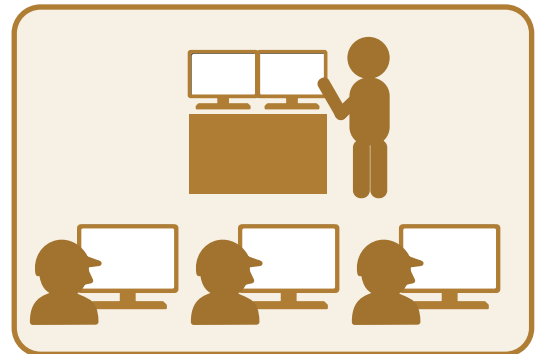
■ Production Capacity

It is designed to process 200kl/h (30,000 BPSD) of AR

■ Main Products

The products produced by this RFCC are as follows:

- Off-gas
- Light Cycle Oil (LCO)
ASTM90%: 351°C / COLOR: 3.0 ASTM / CFPP: -10.5°C
- Naphtha
Octane Number: 92.2/EP: 220°C
- Slurry Oil (CSO)
Viscosity (122F): 913 C.St



Process flow

What Can Be Done

In this product, participants can learn three main operational tasks: 'steady-state operation' 'non-steady-state operation' and 'abnormal response operation'.

Class	Title	Summary
Steady-state operation	Production volume change	Participants aim to quickly become capable of independently operating real equipment by learning to understand the changes in temperature, pressure, flow rate, and analytical values that occur during the reactions and distillation processes from raw materials to products. This includes learning what to operate, when to operate, how much to operate, what to observe, how to judge whether the operation is appropriate, and whether to make corrections or proceed.
	Product oil type property change	The goal is for participants to learn how to adjust the properties of each product to the target values as outlined in the production plan. Additionally, participants aim to understand the time it takes for the analyzer values to change after making adjustments, as well as to learn the specific operation items and quantities required to change the product properties.
Non-steady-state operation	Startup	Participants must memorize all piping and operating procedures and methods, and trust themselves to operate, otherwise they may not be able to keep up with the operation. Especially in the operations of the cracking section, such as catalyst circulation and heat balance, they must fully utilize the knowledge and skills accumulated during daily operations, repeatedly monitor and operate, and digest the operating procedures. Therefore, participants aim to use the FCC model for repeated training, making it easier to perform startups on real equipment.
	Shutdown	The goal is for participants to use simulators to perform shutdown operations, understand the process dynamics such as the temperature and differential pressure of the regenerator tower, and develop an operational sense. By combining the knowledge from real equipment manuals and veteran advice with practical skills, participants aim to smoothly carry out shutdown operations on real equipment.
Abnormal response operation	Air blower failure	Participants will learn how to handle abnormal conditions.
	Water feed pump failure	
	Spent catalyst slide valve failure	
	Regenerated catalyst slide valve failure	
	Flue gas valve failure	
	Temperature indicator high/low	
	Second stage air flow meter indicator high/low	
	Gas compressor failure	
	Feed heater fuel gas supply shutdown	
	First stage air flow valve failure	
	Bottom wash oil flow valve failure	
	LCO flow valve failure	
	CSO flow valve failure	
	Slurry oil pump failure	
	Side reflux pump failure	
	Reflux pump failure	

Contact Information

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