

RMS Engineering, Inc.

5959 West Loop South, Suite 625

Bellaire, Texas 77401

Phone: 281-333-5900

Email: shari1@rmsfcc.com

Coming Soon!!

RMS Fluid Catalytic Cracking (FCC) University

RMS Engineering, Inc. (RMS) is extremely excited to announce the upcoming schedule for the newly developed RMS FCC University. Below is a brief outline of the course, its benefits, as well as a selection of "menu" items that will be covered during this very unique learning opportunity.

Course Description

The development of this FCC-focused university is based on the ever-changing refining industry and its need for a better understanding of fluid catalytic cracking (FCC) and the many benefits of real-practical knowledge of FCC operations and valuable effects of optimized operations.

As mentioned, a "menu" of course subjects is attached to this announcement, from which your syllabus will be personally guided and taught by the industry's leading FCC expert, Reza Sadeghbeigi.

Course Location

The University permanent location is Houston, Texas. RMS expects to open enrollment mid-summer 2015.

Course Length

4-1/2 Days

Monday through Thursday

8 AM – 4 PM

Friday

8 AM – Noon

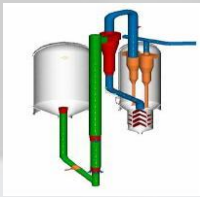
Class Size

3 (minimum) to 6 (maximum)

Fees

\$2,500/participant

Who Should Attend: Process or operation engineers, design engineers and console operators.



MENU (Check "✓" Your Selection)

1) Fundamentals of Cat Cracking	3 Hrs
<ul style="list-style-type: none"> • Process overview • Chemistry of reactions • Feedstock properties • Basic process controls/instrumentation • Role of catalyst • Understanding heat balance • Mode of catalyst regeneration • Role of main fractionator & gas plant • Flue gas pollutants • Unit hazards 	
<p>Target audience:</p> <ul style="list-style-type: none"> • Newly hired operators and engineers • Console operators • Unit and shift supervisor 	

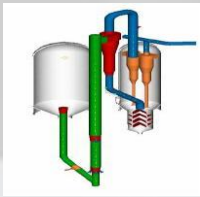
4) Unit Monitoring Tools	2.5 Hrs
<ul style="list-style-type: none"> • Fresh catalyst properties • E-cat properties • Diesel & residue content of the fresh feed • Total and basic nitrogen of the fresh feed • Hydrogen content of the fresh feed • Fresh catalyst, E-cat and additive usage • Slurry yield • Slurry °API gravity and ash content • Cat/Oil ratio • Hydrogen on coke • Regenerator superficial velocity and catalyst loading to cyclones • Cyclone velocities and pressure drops • Hydrogen/Methane ratio • C3/C4 recoveries • Review of APC set points • Catalyst Balance 	
<p>Target audience:</p> <ul style="list-style-type: none"> • Process & Unit Engineers 	

2) Function of Major Equipment	3 Hrs
<ul style="list-style-type: none"> • Standpipes • Slide and/or plug valves • Wye-piece or J-bend section • Feed nozzles • Riser • Cyclones /Trickle valves • Reactor stripper • Regenerator • Air and spent catalyst distributors • Flue gas slide valve and orifice chamber • Flue gas emission controls 	
<p>Target audience:</p> <ul style="list-style-type: none"> • Unit operators • Mechanical engineers and Process engineers • Shift team managers 	

5) Sanity Checks of Operating Data and Heat Balance	1.5 Hrs
<ul style="list-style-type: none"> • Riser outlet temperature profile • Regenerator temperature profile • Raw versus actual catalyst bed levels • Pressure differentials across the slide /plug valves • Feed nozzles, stripping steam and other steam back pressures • Cyclone delta pressure • Catalyst flowing densities • Overall "heat of reaction" • Delta coke • Catalyst heat capacity 	
<p>Target audience:</p> <ul style="list-style-type: none"> • Process engineers • Shift team supervisors • Console operators 	

3) Operating Conditions	2 Hrs
<ul style="list-style-type: none"> • Feed preheat temperature • Cracking temperature • Regenerator temperatures • Total air rate, carrier air, supplemental oxygen • Reactor & regenerator pressures • Catalyst circulation rate • Dispersion and stripping steam rates • HCO, slurry, naphtha recycle • Excess oxygen or CO₂/CO ratio in the flue gas 	
<p>Target audience:</p> <ul style="list-style-type: none"> • Console operators • Process engineers • Advance control engineers • Economic and planning engineers 	

6) Sanity Checks of Reactor Yields	1.5 Hrs
<ul style="list-style-type: none"> • Inert gas • H₂S yield • Mass balance closure • Ratio of propylene to propane • Ratio of C₄ olefins to total C₄'s • Product distillation methods • Cut point adjusted yield 	
<p>Target audience:</p> <ul style="list-style-type: none"> • Process engineers • Economic and planning engineers 	



RMS Engineering, Inc.
 5959 West Loop South, Suite 625
 Bellaire, Texas 77401
 Phone: 281-333-5900
 Email: shari1@rmsfcc.com

MENU

(Check "✓" Your Selection)

	7) Catalyst Fluidization & Pressure Control	2.5 Hrs
<ul style="list-style-type: none"> Standpipe fluidization Impact of catalyst properties on fluidization Reactor and regenerator catalyst levels Pressure and density profiles in reactor-regenerator circuits Importance of single-gauge pressure survey 		
Target audience:		
<ul style="list-style-type: none"> Console operators Unit engineers Unit operators 		

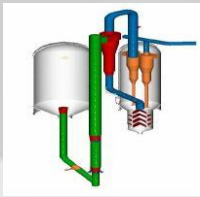
	10) Environmental Controls	2.0 Hrs
<ul style="list-style-type: none"> CO SOx NOx Particulates Opacity Gasoline Sulfur Gasoline Benzene 		
Target audience:		
<ul style="list-style-type: none"> Environmental engineers Console operators Process engineers 		

	8) Main Fractionator and Gas Plant	2.5 Hrs
<ul style="list-style-type: none"> Role of the Main Fractionator & Gas Plant Distillation principles Heat integration Product recovery and controls Role of wet gas compressor C3/C4 recovery 		
Target audience:		
<ul style="list-style-type: none"> Unit and console operators Unit engineers 		

	11) Equipment Design for Maximum Reliability	3 Hrs
<ul style="list-style-type: none"> Standpipes Slide and/or plug valves Wye-piece or J-bend section Feed nozzles Riser Reactor vapor line Cyclones / Trickle valves Reactor stripper Regenerator Air and spent catalyst distributors Flue gas slide valve and orifice chamber Expansion joints 		
Target audience:		
<ul style="list-style-type: none"> Mechanical and maintenance engineers Process engineers 		

	9) Feed Diversion & Automatic Shutdown System	2 Hrs
<ul style="list-style-type: none"> Cause & effect scenarios Loss of air blower Loss of feed rate Loss of wet gas compressor Low slide/plug valve pressure differential High reactor catalyst bed level Low riser outlet temperature 		
Target audience:		
<ul style="list-style-type: none"> Console and outside operators Process and unit engineers Reliability and advance control engineers 		

	12) Refractory Selection and Installation	3 Hrs
<ul style="list-style-type: none"> Purpose of refractory lining Composition of refractory lining used in FCC Properties Choices of refractory lining & anchor systems Refractory lining manufactures Key quality control parameters to monitor Installation techniques Curing techniques Failure mechanism Specifications (general and job related) 		
Target audience:		
<ul style="list-style-type: none"> Mechanical and reliability engineers Process and unit engineers 		



RMS Engineering, Inc.
 5959 West Loop South, Suite
 625 Bellaire, Texas 77401
 Phone: 281-333-5900
 Email: shari1@rmsfcc.com

MENU

(Check "✓" Your Selection)

13) Troubleshooting	3 Hrs	16) Unit Optimization (No Capital)	2 Hrs
<ul style="list-style-type: none"> Excessive catalyst loss from reactor and/or regenerator Excessive flue gas stack opacity Erratic and inadequate catalyst circulation rate Excessive afterburning Excessive catalyst deactivation Coking and fouling of slurry cooling circuit Premature tower flooding and foaming Expander fouling Poor product yields <p>Target audience:</p> <ul style="list-style-type: none"> Console and outside operators Process and mechanical engineers Shift team supervisors 		<ul style="list-style-type: none"> Understanding unit objectives and limitations Feedstock quality & blend Catalyst usage and formulation Catalyst additives Operating conditions Pressure balance Operating at reduced feed rates efficiently <p>Target audience:</p> <ul style="list-style-type: none"> Process and unit engineers Economic and planning engineers Technical service managers 	
14) Unit Startup	3 Hrs	17) Unit Debottlenecking (No Capital/Low Capital)	2.5 Hrs
<ul style="list-style-type: none"> Key Punch List Items Refractory drying/curing schedule Main fractionator heat-up and dry out Reactor – Fractionator isolation blind Catalyst loading to prevent premature catalyst loss from regenerator Purging and catalyst transfer to reactor system Feed introduction – rate of feed injection rate Unit “pressure bump” to clear obstruction DCS display screens to display useful start up information <p>Target audience:</p> <ul style="list-style-type: none"> Console and outside operators Process and mechanical engineers Shift team supervisors 		<ul style="list-style-type: none"> Combustion air limitation Wet gas compressor limitation Fresh feed hydraulics Slide valve differential limitations Catalyst circulation rate Regenerator temperature Regenerator superficial velocity Tower flooding Overhead cooling Excessive dry gas yield Environmental <p>Target audience:</p> <ul style="list-style-type: none"> Process and unit engineers Economic and planning engineers Technical service managers 	
15) Available Technologies	2 Hrs	18) Capital Project Development and Turnaround Planning	1.5 Hrs
<ul style="list-style-type: none"> Feed & Catalyst Injection System Riser Termination Device Catalyst Stripping Air & Spent Catalyst Distribution System Catalyst Regeneration and Separation Systems Flue Gas 3rd-stage Separators Flue Gas Catalyst Emission Controls Flue Gas SO₂/SO₃ Controls Flue Gas NO_x Controls Gasoline Sulfur Controls Gasoline Benzene Controls <p>Target audience:</p> <ul style="list-style-type: none"> Process and environmental engineers Economic and planning engineers Technical service and project managers 		<ul style="list-style-type: none"> Front End Loading (FEL) evaluations Obtaining meaningful total installed cost (TIC) estimates Arriving at realist benefits Lessons learned <p>Target audience:</p> <ul style="list-style-type: none"> Process and project engineers Economic and planning engineers 	