
KnowledgeWeb™
LEARNING OPTIMIZED
FOSTER WHEELER
"An investment in knowledge always pays the best interest"
- Benjamin Franklin

DCU KnowledgeWeb

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Calgary, AB **September 13-16, 2010**

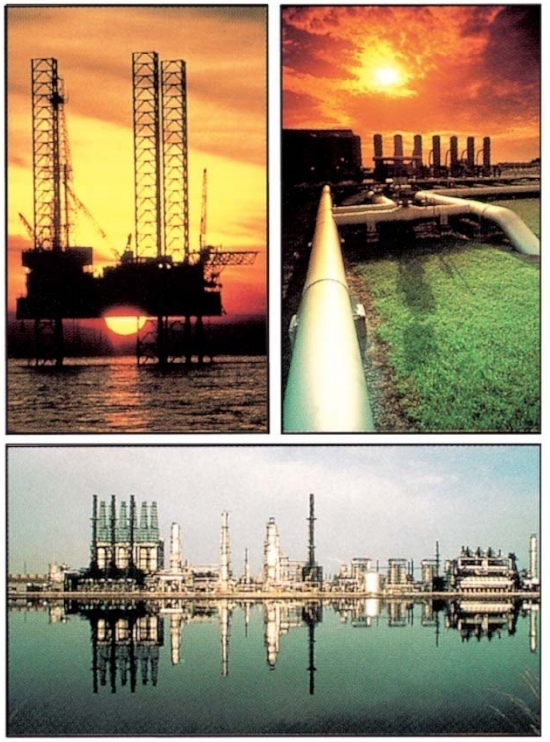
American Petroleum Institute

PILOT®

RDC Technologies for Learning

Programs in Learning Operating Techniques

- 50 years as the industry standard for operator training
- Certified by the American Petroleum Institute
- Over 40 million hours of training delivered around the world
- More than 200 web-based ePILOT courses in EH&S and Technical Skills Libraries.
- Over 600 hours of comprehensive learning content- proven to transfer knowledge.



e LEARNING ASTD CERTIFICATION INSTITUTE CERTIFIED COURSE

AUTHORIZED IACET PROVIDER

API Certified Training Provider

PILOT 50 YEARS Programs in Learning Operating Techniques

Experience you can trust.

Delayed-Coking – Unique Challenges:

Complex process technology and innovation are far out pacing the capacity of traditional technical training. Coking is a unique process with unique challenges to manage:

- batch process
- extreme temperatures
- highly viscous feed
- coke-cutting and handling

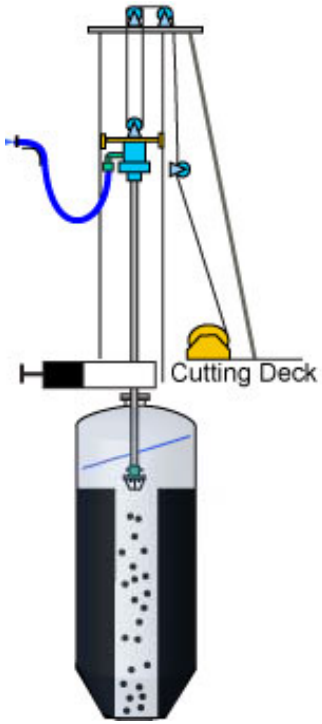
Delayed-coking requires a unique program that can assimilate new innovation, tenured experience, fundamental process principles and create knowledge that will improve operator competency.

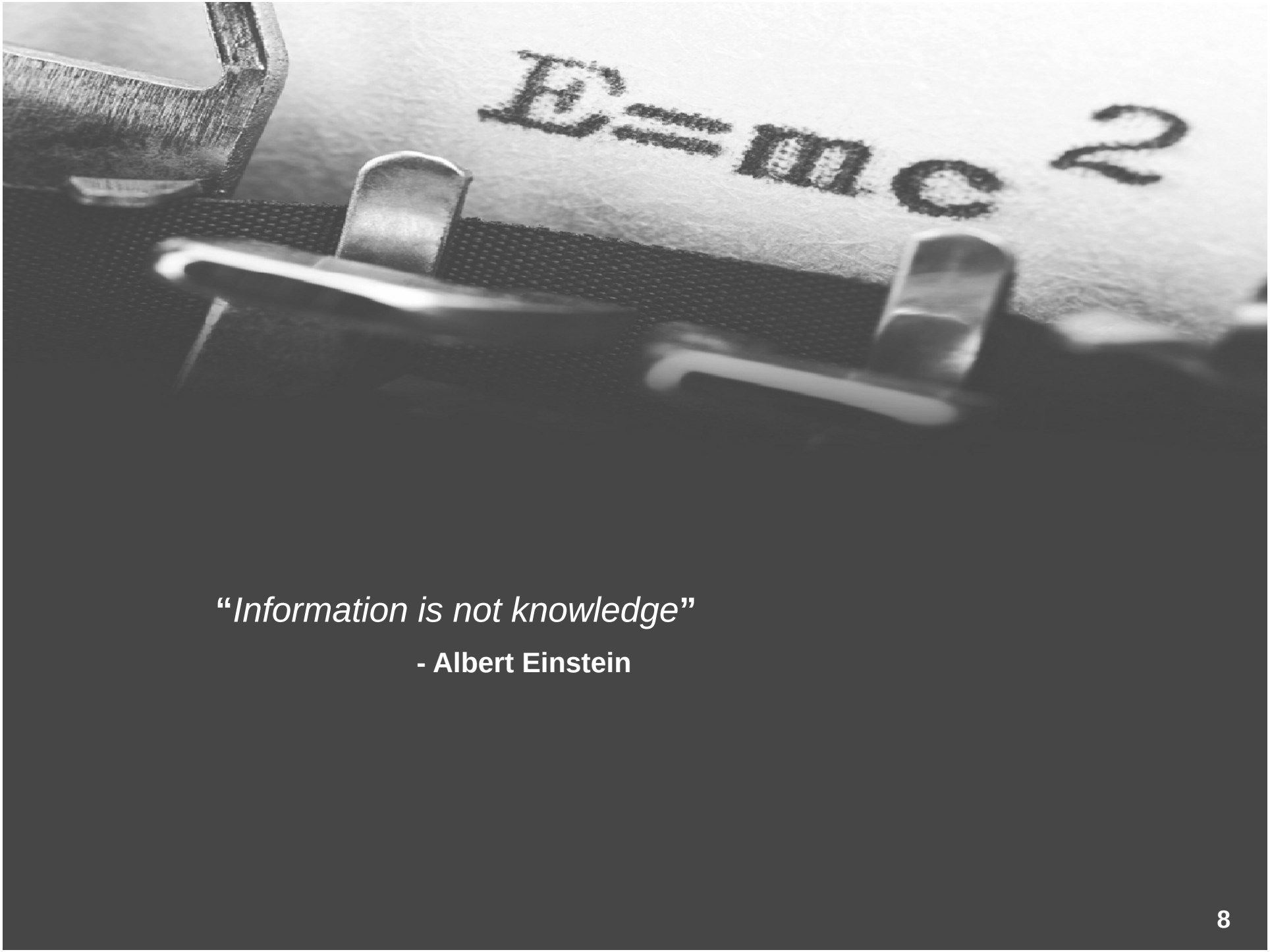
Protecting Your Investment

Working together to improve DCU operator competency in a new paradigm…

Industry Challenges Driven By:

Traditional Training Isn't Cutting It…





"*Information is not knowledge*"

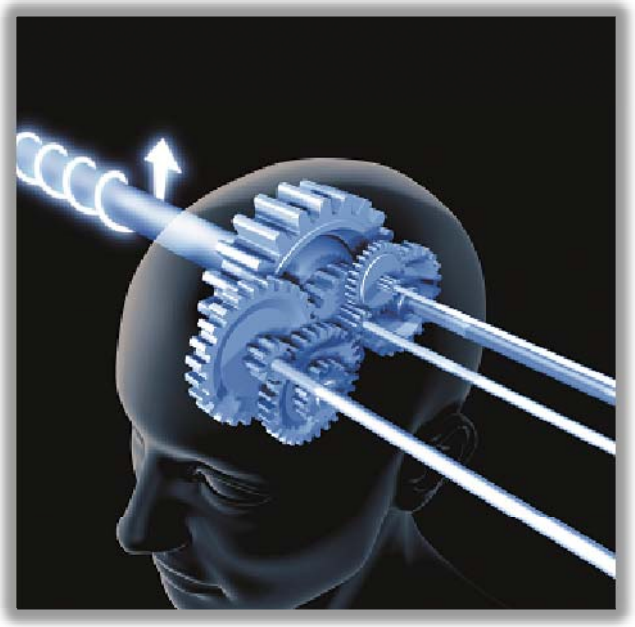
- Albert Einstein

"We are drowning in information, but starved for knowledge"

- John Naisbitt

Learning is a complex activity involving:

- cognition
- memory
- association formation
- perception
- problem solving



Learning becomes useful in an organization when a learner is able to retrieve data and information stored in long-term memory and use that knowledge to improve production/reliability, increase safety, and prevent and solve problems…

DCU KnowledgeWeb Collaboration

Targeted Goals:

- Define absolute knowledge requirements
- Tactical approach to learner progression
- Pathway to reach 100% competency
- Sustainable platform for managing knowledge
- Site/unit-specific relevance – not generic
- Interactive problem solving – essential to learning
- Web-accessible 24 X 7

Defining knowledge requirements…

MicroCourse Title: 2.0 - SYDEC Delayed Coker Systems Overview

Terminal Objective: Describe how the process flows through the coker system.

Lesson ID/Title: 2.1 - Feed Streams

Learning Objective: Identify the feed flow into the coker system.

ID	Learning Points	Graphic Asset Requirements	Evaluation Requirements	Source Material
2.1.1	Feed Streams (total feed rate is maintained at a constant rate. This is done by varying the tank (cold) feed rate when the hot feed rate changes)	Close view of feed streams	• Match the type of feed stream with its description	• FW Design Basis - PFT & 6040_ rev. C.pdf Section 1.0 • FW Delayed CokerTraining Module.ppt • Depr210Training.ppt Slide 6,9
2.1.2	Feed Direct from Unit			
2.1.3	Feed Direct from Tank (tank feed will swing to maintain steady feed rate)			

Lesson ID/Title: 2.2 - Feed Preheat System

Learning Objective: Describe the feed preheat system, including the pumparounds.

ID	Learning Points	Graphic Asset Requirements	Evaluation Requirements	Source Material
2.2.1	Feed Preheat Equipment	Close up view of equipment	• Match the equipment with its function	• FW Delayed CokerTraining Module.ppt • FW Design Basis - PFT & 6040_ rev.

DCU Knowledge Structure

Defined knowledge requirements, validated against operator roles.

Process Overview

- Introduction to SYDEC Coking
- SYDEC Delayed Coker Systems Overview
- SYDEC Delayed Coker Chemistry

Primary Equipment

- Fractionator System
- Coker Heater System
- Coke Drum System
- Gas Plant Equipment

Auxiliary Equipment

- Fractionator Auxiliary Systems
- Cutting and Quench Water Systems
- Coke Handling

Process Operations

- Fractionator Operations and Key Process Variables
- Coker Heater Operations
- Coke Drum Operations
- Operating Procedures
- Gas Plant Operations

Consequences of Deviation

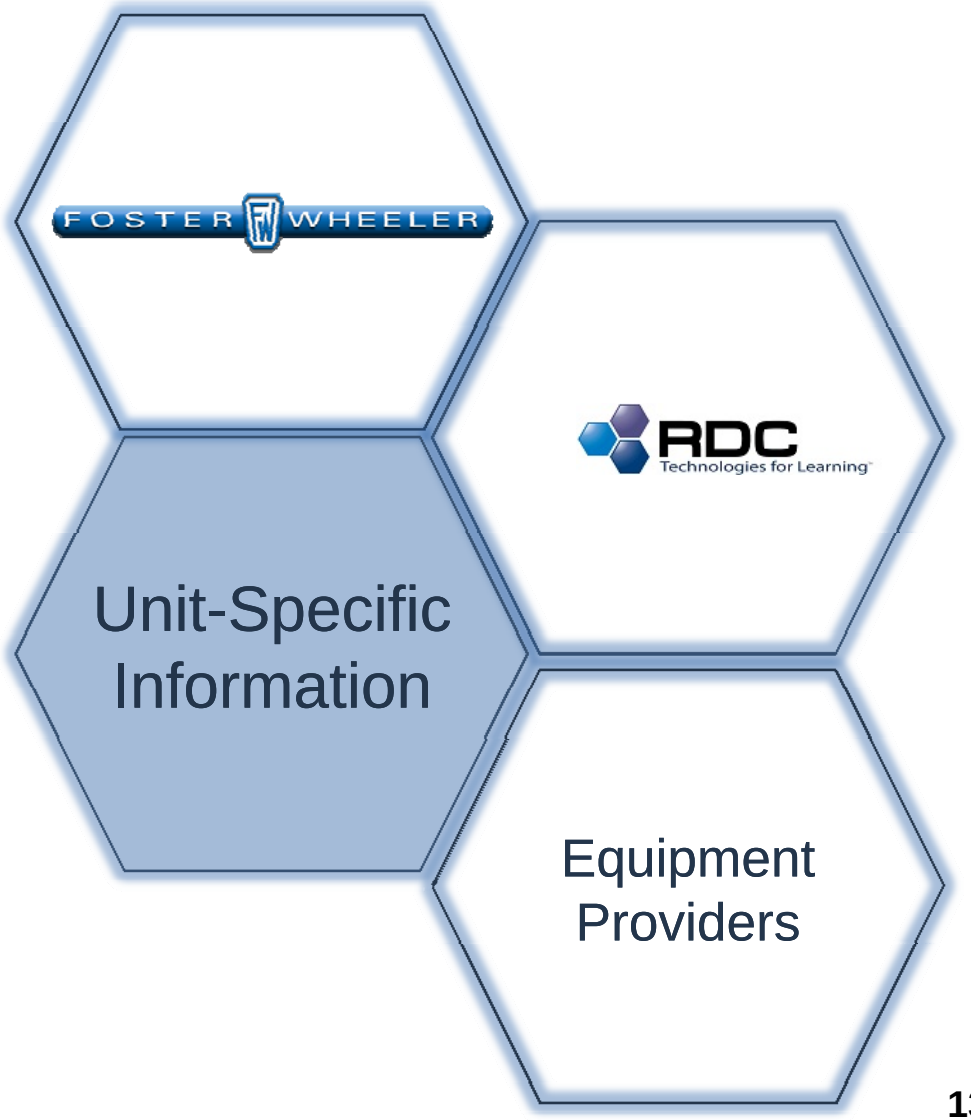
- Preventing Abnormal Operations
- Coker Process Hazards

Collaborative Strength is the Value

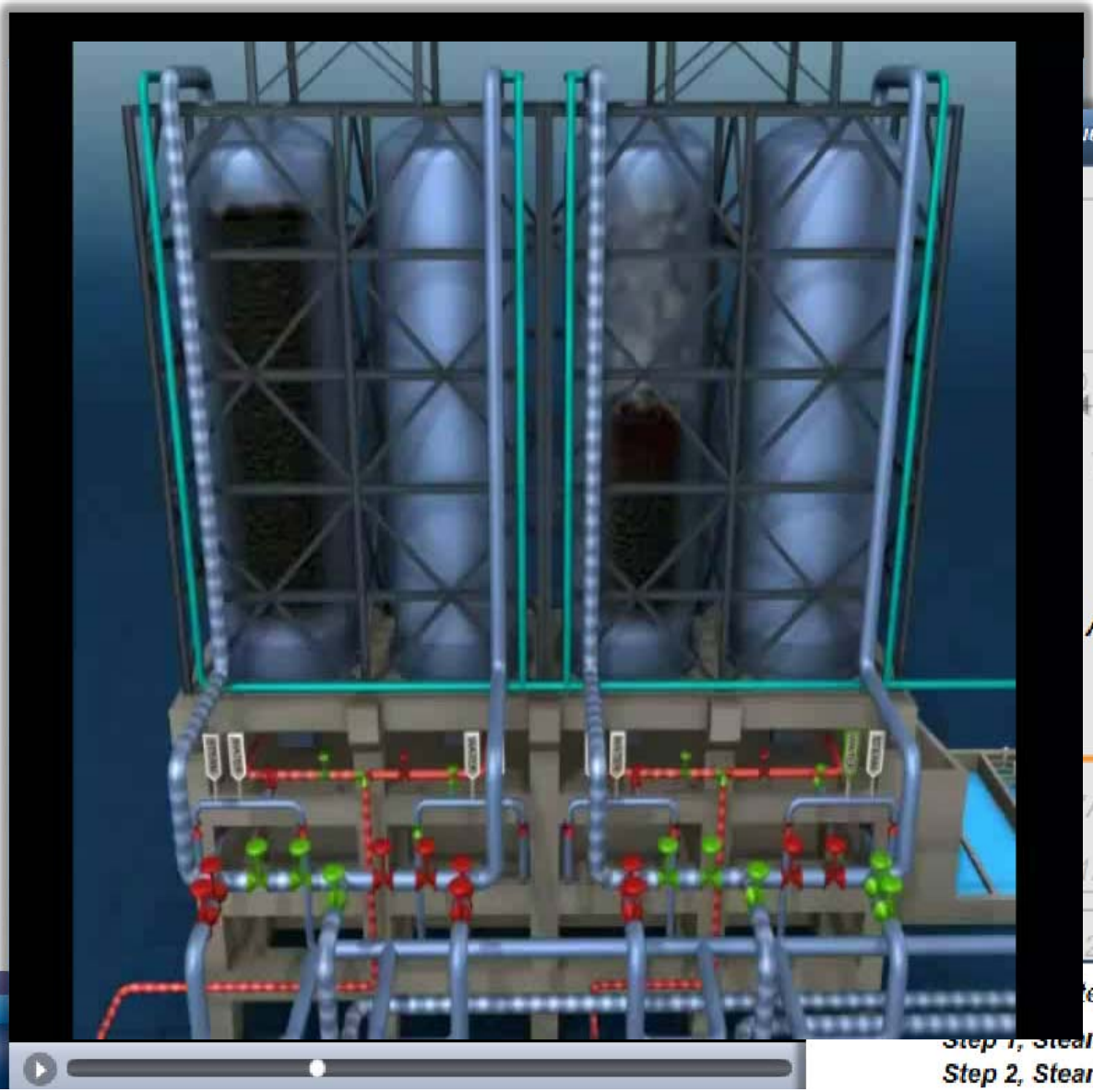
Foster Wheeler brings:
- Process technology expertise
- International best-practices

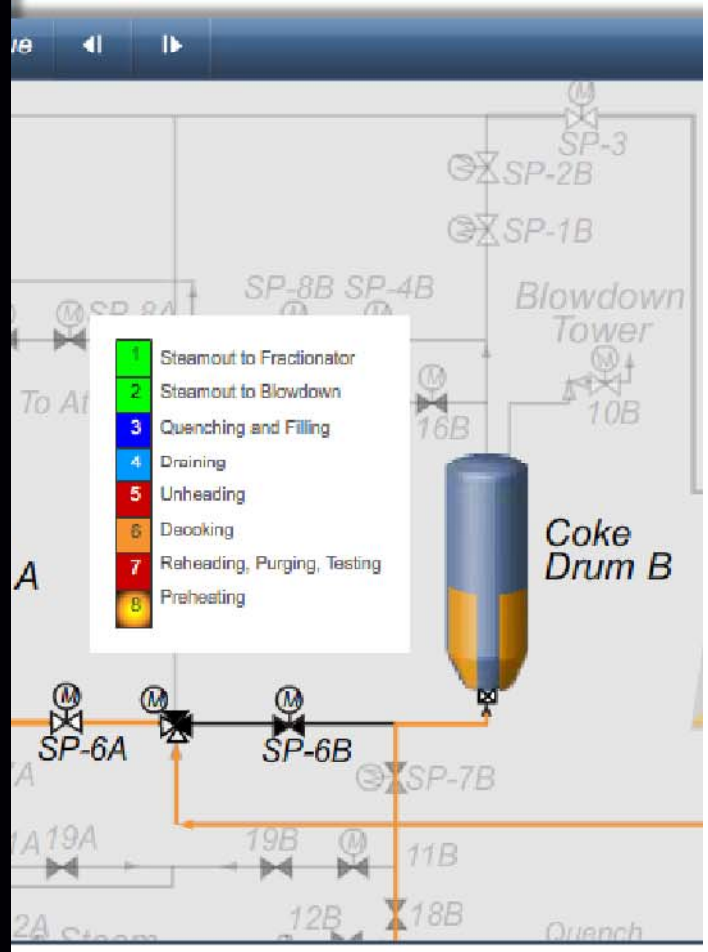
RDC brings:
- Knowledge-transfer environment
- Proven instructional design methods

Equipment Providers bring:
- Product knowledge
- Reliability support



Process Technology Expertise





eps in the coking cycle:

Step 1, Steamout to Fractionator
Step 2, Steamout to Blowdown
Step 5, Unheading
Step 6, Decoking

Knowledge Transfer & Management Infrastructure

RDC Technologies for Learning

KnowledgeWeb LEARNING OPTIMIZED

Sorted by Course Code Ascending

!	Code	Rev	Course Title
	A4070	1.0	Process Overv
	A4071	1.0	Primary Equip
	A4074	1.0	Consequences
	DCU-EM-1.5	1	DCU - Emerge
	DCU-Emer-JTA	1	DCU - Emerge
	DCU-GunDrill	1	DCU - Gun Dri
	DCU-NORM-Task	1	DCU - Normal
	DCU-OP-1.4	1	DCU Startup P

Introduction to SYDEC Delayed Coking

Resource Development Compa

Help

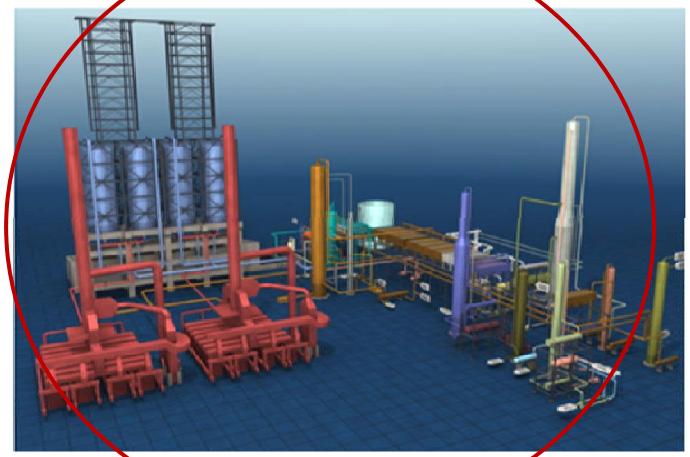
Table of Contents

- Pre-Assessment
- Overview
- SYDEC Coking Process
  - Process Flow
  - Coker Products
- Gas Plant
- Types of Coke
- Review
- Post-Assessment
- SYDEC Delayed Coker System...

SYDEC Coking Process

Delayed coking is a cyclic process that upgrades vacuum residues to a wide range of lighter hydrocarbons and distillates through thermal cracking. The byproduct of delayed coking is petroleum coke, or coke.

During the process, gas oil feedstocks, distillates, naphtha, and petroleum residues are tracted from the residue. The al for most residue conversion erations is to operate the coker maximize the yield of clean stillates and minimize the yield of ke.



maximize liquid yields, the DEC coker unit is designed to erate under low pressure with nimal recycle.

y steps in the process include:

- Heat residue to about 930° F (500° C) in coker furnace.
- Transfer the hot residue to the coke drum before it has formed coke.
- Switch the drums on a timed cycle (12 to 24 hours).
- Decoke the full drum using high pressure water jets.
- Recover the cut coke, crush, and prepare for shipment.
- Recycle water to eliminate waste.
- Fractionate cracked products into gas, coker naphtha, light coker gas oil (LCGO) and heavy coker gas oil (HCGO).
- Further process fractionated products in downstream units.

e Refinery has developed a number of procedures that describe both normal and ergency situations. You should be familiar with the location and contents of these procedures.

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DATE: May 2009
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REV: 3

Delayed Coker Unit 12
Unsaturated Gas Plant Unit 13

OPERATING GUIDELINES

5.0 STARTUP PROCEDURES

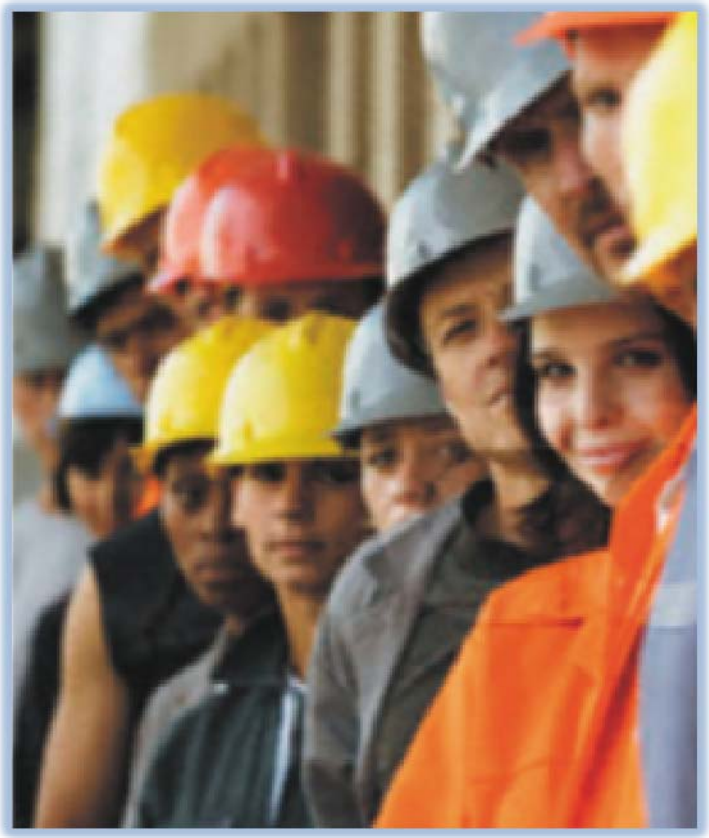
5.1 Introduction

The operator should adhere to the general commissioning plan as much as possible. The startup procedure in this section is intended as a general guide for the operators during the initial startup of the Delayed Coker Unit.

It is important that all equipment/lines/pumps, etc., be adequately steamed, air blown, water washed, and/or flushed during phases of startup and/or shutdown. Before the startup procedures described in Sections 5.3 and 5.4 can be implemented for a first-time plant startup, the necessary precommissioning activities must be completed. These include, but are not limited to, the following:

Done Unknown Zone | Protected Mode: Off

Measureable Success

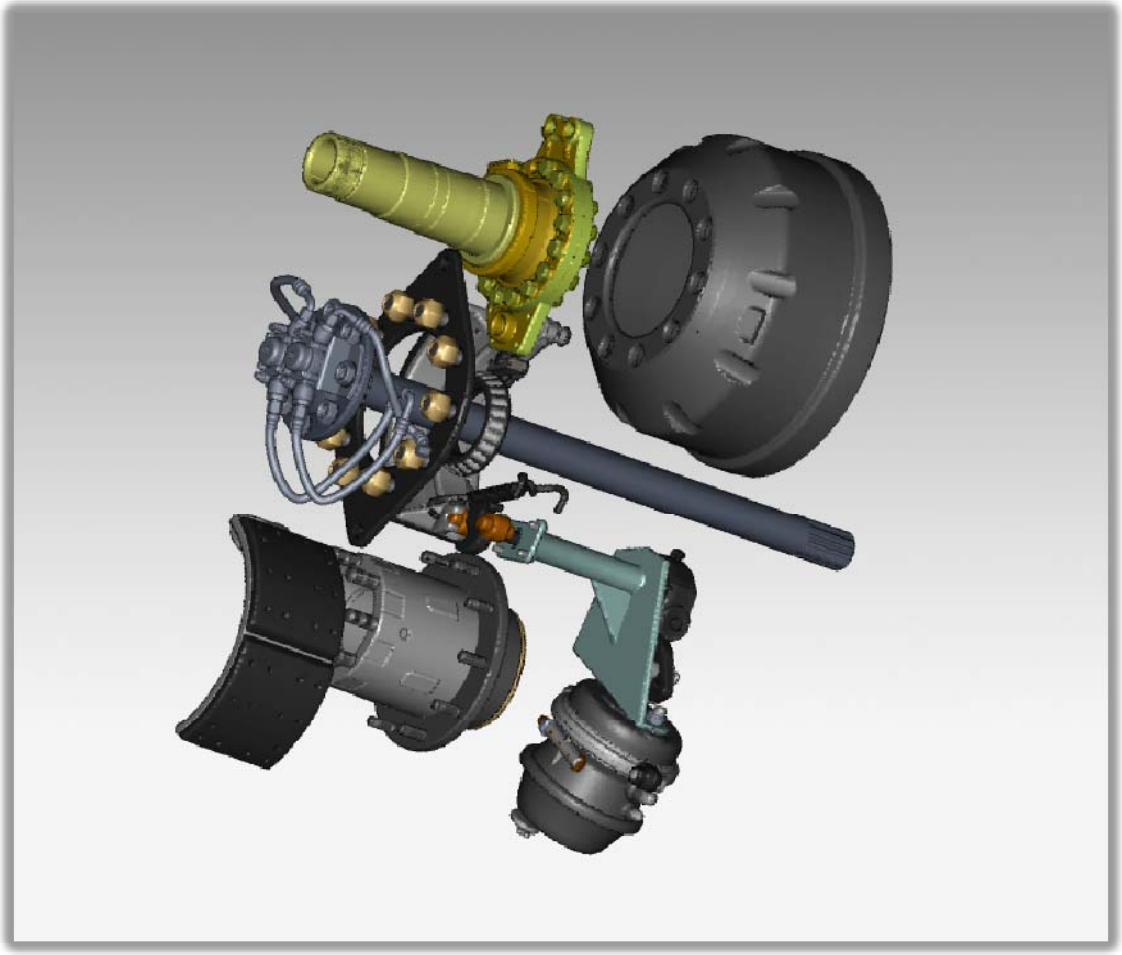


Differential Learning

- Mastery Assessments
- Identify Knowledge Gaps
- Personal Learning Path
- Remediation to 100% Proficiency

OEM Contributions

- Reliability improvement
- Product knowledge
- Maintenance procedures
- Detailed schematics
- Best practices



Change behavior…

Improve performance.

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