



Crude Oil Quality Group (COQG)

CRUDE OIL QUALITY

What it is

Why it is important

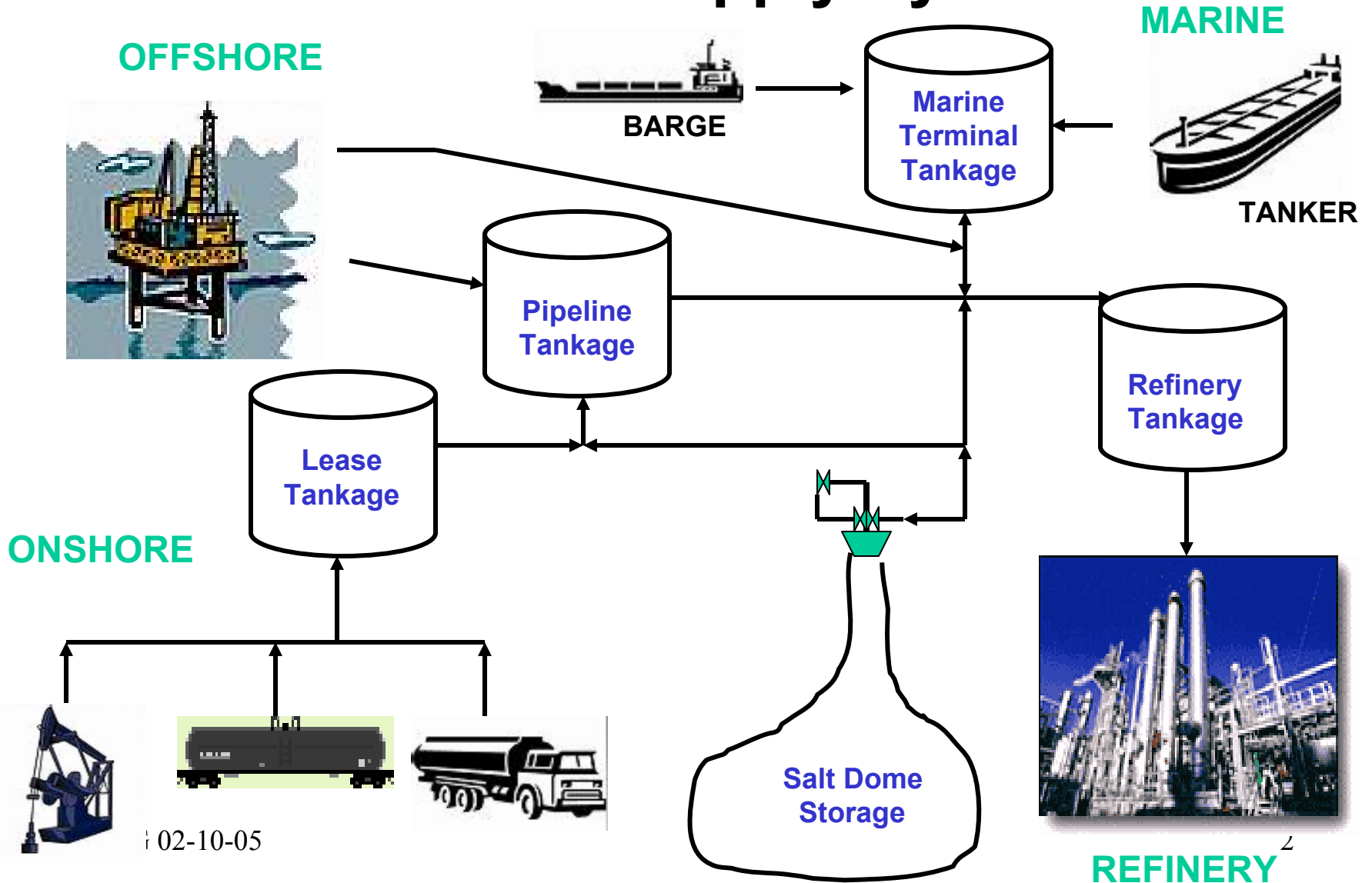
What we can do to make it better

Who needs to act



Crude Oil Quality Group

Crude Oil Supply System

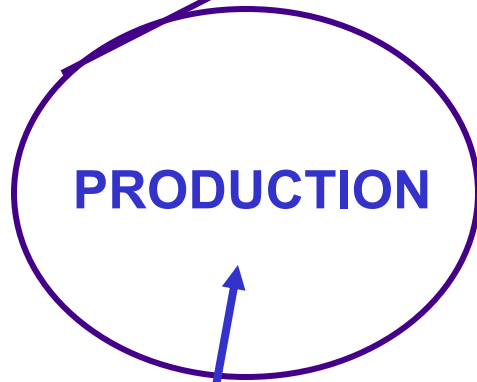


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REFINERY²

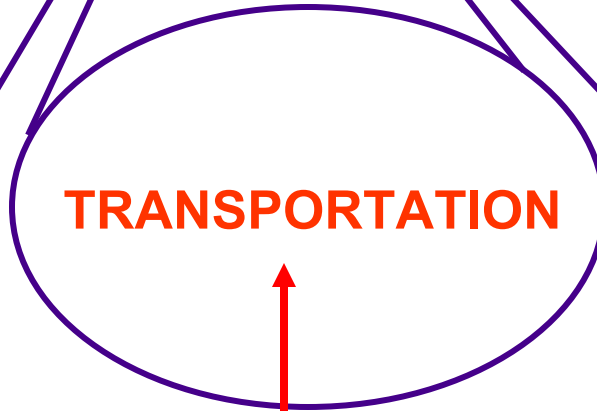
Driving Forces By Industry Segment

**TRADING -
MAXIMIZE TRADE REVENUE**



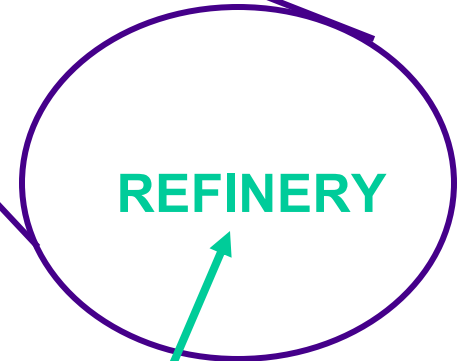
PRODUCTION

**Minimize developmental cost
Minimize production cost
The crude must flow**



TRANSPORTATION

**What goes in must come out
Minimize losses and downtime
Minimize shipping costs**

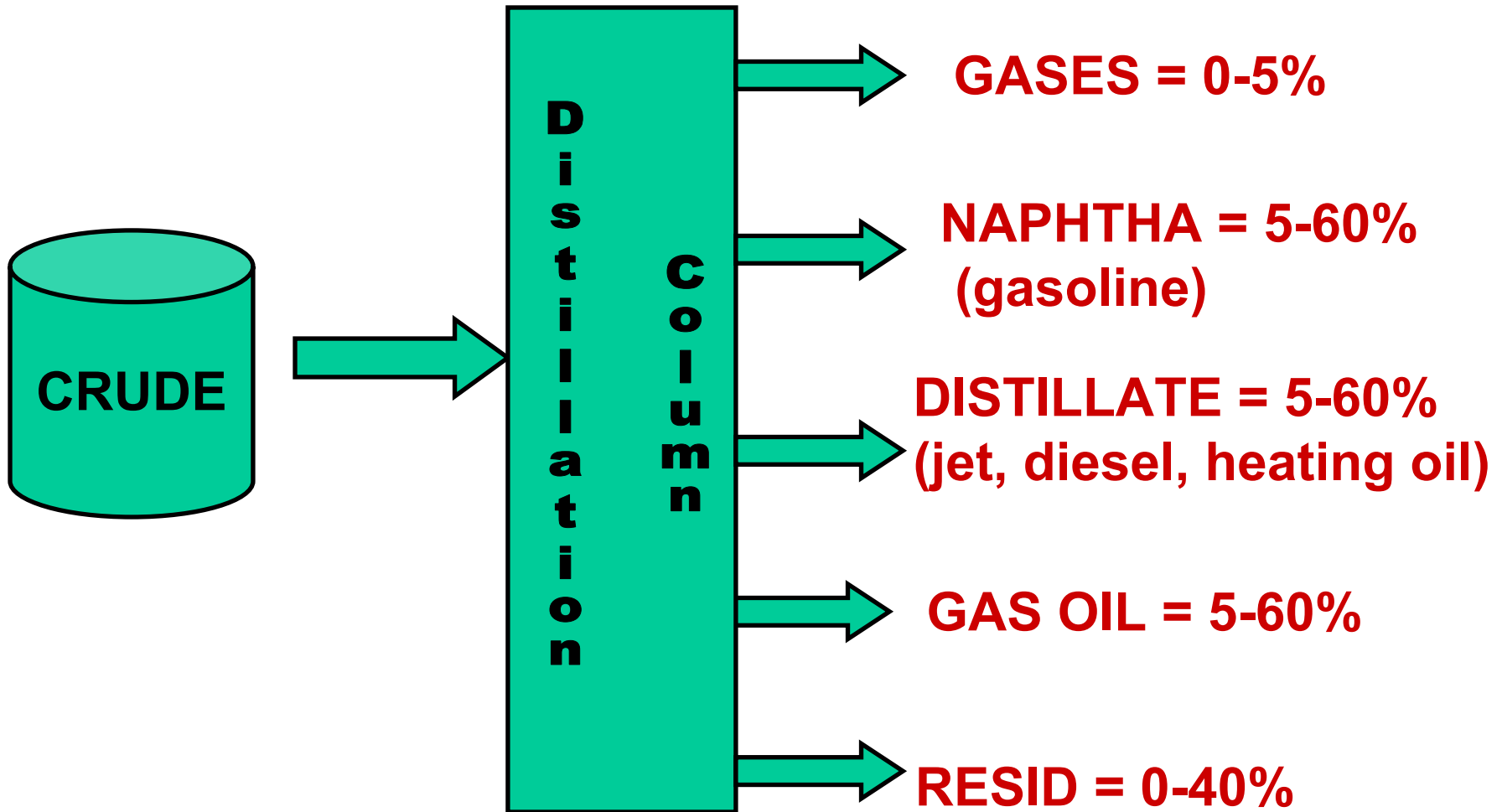


REFINERY

**Safe, environmentally sound,
reliable refinery operation
Consistent crude slate
Get what's paid for**

What is Crude Oil?

A mixture of hydrocarbons



What Is Crude Oil Quality?

- Maintaining the integrity and consistency of the refining characteristics of a crude oil stream
- The commonly used industry standards of gravity and sulfur, while important, do not adequately define a crude oil
- Crude oil quality is achieved through identification of a crude's important characteristics and by protection of those parameters

What Is Crude Oil Quality?

- It's about getting what you paid for
 - Consistent hydrocarbon distribution
 - No surprises (atypical metals, sulfur, acidity, etc.)
 - No contamination (chemical wastes, production wastes, transportation wastes)
- Our definition of QUALITY does NOT mean light vs. heavy or sweet vs. sour – it refers to the expected vs. the unexpected and the typical vs. the inconsistent

What Can Happen to Crude Oil to Change its Quality?

- DEGRADATION - Normal operations
- CONTAMINATION - Outside ingredient NOT normally used
- ALTERATION - Outside ingredient, but used in normal operations
- BLENDING - Mixing of different crude streams, particularly streams with very different properties or values.

What Happens to Crude Oil Before it Arrives at the Refinery?

DEGRADATION (*normal operations*)

- **Tank Bottoms, Interfaces, Line Fill, Tank Cleaning Sludge**, etc. are normal operations that are managed by the Pipelines

What Happens to Crude Oil Before it Arrives at the Refinery?

CONTAMINATION (*NOT normal*)

- **Cleaning Chemicals and Wastes, Chlorinated Solvents** can be introduced in the production and transportation systems. These substances, as well as others, are **NOT** normal operations and must be communicated to the end-user.

What Happens to Crude Oil Before it Arrives at the Refinery?

ALTERATION (*normal*)

- **Cavern Brine, Ship Ballast, Slops, and Production Chemicals such as Methanol and Anti-foams** are routinely added to crude oil in the production system and need to be communicated to the end user
- **Drag Reducing Agents, Corrosion Inhibitors, Pour Point Depressants** are routinely added to crude oil in the transportation system and need to be communicated to the end user

Let's Talk About Blending...

- Crude oil is intrinsically a complex mixture of hydrocarbons
- Sometimes, two or more crudes (each a complex mixture) are deliberately blended to form a new variety of crude
 - Some of these blends are transparent
 - Well head driven
 - Logistics driven
 - Refinery charge driven
 - Some of these blends are NOT transparent
 - Dumbbell crudes (for example: blended to meet a target such as gravity)
 - Economically driven blends (for example: spiking sour into sweet to take advantage of a price spread)
- Heavy crudes can be blended with a density / viscosity reducer (natural gasoline, synthetic and processed crudes, butane)
 - The Canadian and Venezuelan oil industries have extensive experience in bitumen dilution

What Can be Done to Improve the Quality of Crude Oil?

- **MANAGE** degradation
- **CONTROL** contamination
- **UNDERSTAND** alteration
- **MITIGATE** the effects of blending

Who Needs to Act to Improve the Quality of Crude Oil?

– PIPELINES

- do a good job of managing degradation
- are being educated on the dangers of contamination
- communication is key

– PRODUCERS

We are asking the producers:

- to be forthcoming about what is being added
- to be forthcoming when significant differences to established parameters are expected
- for more frequent assay updates

Who Needs to Act to Improve the Quality of Crude Oil?

– TRADERS

- be a part of the solution - specify what you are buying
- follow up on changing crude parameters
- understand crude oil quality terms
- know what you are receiving and how it matches your requirements

– REFINERS

- up to date crude evaluations are a must
- mitigation of degradation and alteration usually fall on the refiners' shoulders
- know how your supply system works

What's a Trader to Do?

- **SPECIFY WHAT YOU ARE BUYING**
 - Contracts
 - General Terms and Conditions
 - Reference existing pipeline specifications
 - Utilize charter party specifications (vessels / barges)
 - Practice ethical standards / statements at all times

There are Many Examples of Quality Requirements

- Gary Williams (specific quality parameters such as HTSD)
- Shell Trading (pipeline specifications)
- Plains Marketing (pipeline specifications)
- Canadian Association of Petroleum Producers (working on industry-wide Terms and Conditions)
- US DOE (specifications for new purchases of SPR crude with analytical follow-up on delivery)
- Intermediates are very specific and defined, why aren't crude oils?

What's a Trader to Do?

- **FOLLOW UP ON CHANGING CRUDE PARAMETERS**
 - Producer information
 - Load port changes
 - Seasonal variation
 - Market intelligence
 - Operating inefficiencies
 - Unscheduled turnarounds
 - Communicate with upstream and downstream operators

What's a Trader to Do?

- **UNDERSTAND CRUDE OIL QUALITY**

 - Help is Available**

 - API Publication “Protecting Crude Petroleum Quality” (can be found on COQG.org)
 - Exxon “Encyclopedia of Petroleum Products”
 - COQG.org Forum Section
 - **Listing of crude oil characteristics**
 - **Listing of web sites that post crude oil characteristics for many crudes**
 - ASTM Publication “The Significance of Petroleum Testing”
 - ASTM course on “Crude Oil – Sampling, Testing and Evaluation”

What's a Trader to Do?

- **KNOW WHAT YOU ARE RECEIVING AND HOW IT MATCHES YOUR REQUIREMENTS**
 - Crude oil monitoring is a must
 - Most refineries and pipeline systems already have monitoring programs in place
 - USE THE RESULTS to constantly reevaluate any given crude oil
 - Follow up on changes to a crude with the producer
 - why has the change occurred?
 - is it permanent?
 - is the noted difference the beginning of a trend or a step change?

Remember :

What you buy is what
you should receive!

What Next?

1. Education for producers, traders, transporters and refiners
2. Easily accessible characteristics for all grades of crude oil
 - * Not just gravity and sulfur *
3. What do you need to know to better manage crude oil quality?

**EDUCATION
WORKS**



Crude Oil Quality Group (COQG)

Mission Statement

The Crude Oil Quality Group (COQG) is dedicated to the belief that maintaining the integrity and consistency of the refining characteristics of crude oil streams is of importance to all parties involved in crude oil activity, from production locations to the refinery. The COQG believes the commonly used industry standards of gravity and sulfur do not adequately define crude oil quality, and should be expanded to include other characteristics. The COQG is opposed to the alteration of crude oil streams, such as through the injection of processed gas liquids, without the knowledge and consent of the parties involved.

To promote these beliefs, the COQG will strive to:

- Communicate our beliefs to the oil industry at large;
- Create and sponsor forums for open communications and the sharing of information and ideas to better educate the crude oil industry;
- Be pro-active in the advancement of our beliefs with all areas for the crude oil arena, including production, transportation, trading, and refining sectors;
- Improve the overall quality of crude streams through the promotion of crude quality programs on common carrier transportation systems; and
- Be closely involved with various industry associations to further promote our beliefs.