Ultra Low Sulfur Diesel Implementation

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Outline

- Technology
- Infrastructure

Technology

- Extensive sulfur removal using Hydrotreating Process
- Requiring Hydrogen
- Precious Metal Catalyst.

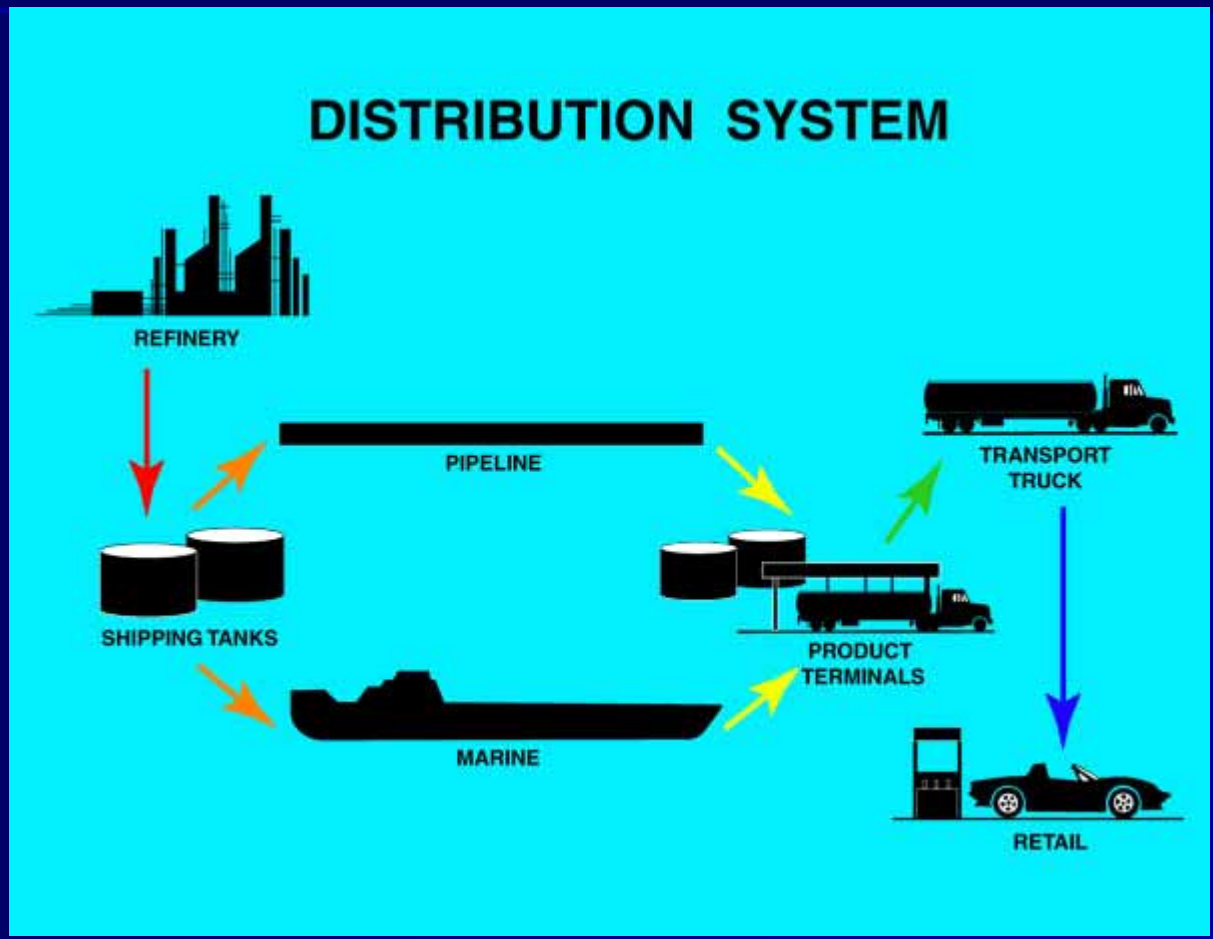
Technology

- Desulfurization (Mild Hydrotreating)
  - Low temperature, Low pressure catalyst reaction.
  - Removes sulfur from the fuel.
- Hydrocracking (Severe Hydrotreating)
  - High Temperature, High pressure catalyst reaction.
  - Removes sulfur, nitrogen and aromatics.

Technology

- Design for specific sulfur specification over a specified time period (Catalyst Life).
  - Lower than spec sulfur means shorter Catalyst Life.
- Change in feedstock handling
  - Low Quality Feed Stocks
- Adjust for changes in fuel property

Infrastructure



Infrastructure

- What will terminals chose to carry?
  - HSD, LSD & ULSD
  - HSD & ULSD
  - LSD & ULSD
  - ULSD only
- What products pipelines will chose to accept?

Infrastructure

- Pipeline Sulfur Specifications
  - Multiple Pipelines involved
  - Sulfur spec too low, will need to rethink logistics.
  - Maybe bypass certain pipelines.
  - Utilize more barges and truck longer distances.
  - Change supply locations.

Conclusion

- Balancing act between reactor catalyst life and alternative transportation strategies to minimize costs.
- In the end fuel will be delivered.
- Economics will determine how.

Thank you

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