

# ***Land Based Liquid Pipelines***

***A Presentation by***

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to the  
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# ***AGENDA***

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- ❖ **Basics About Liquid Pipelines**
- ❖ **Construction, Operations and Maintenance**
- ❖ **Who Regulates Liquid Pipelines**
- ❖ **Current Business Challenges**

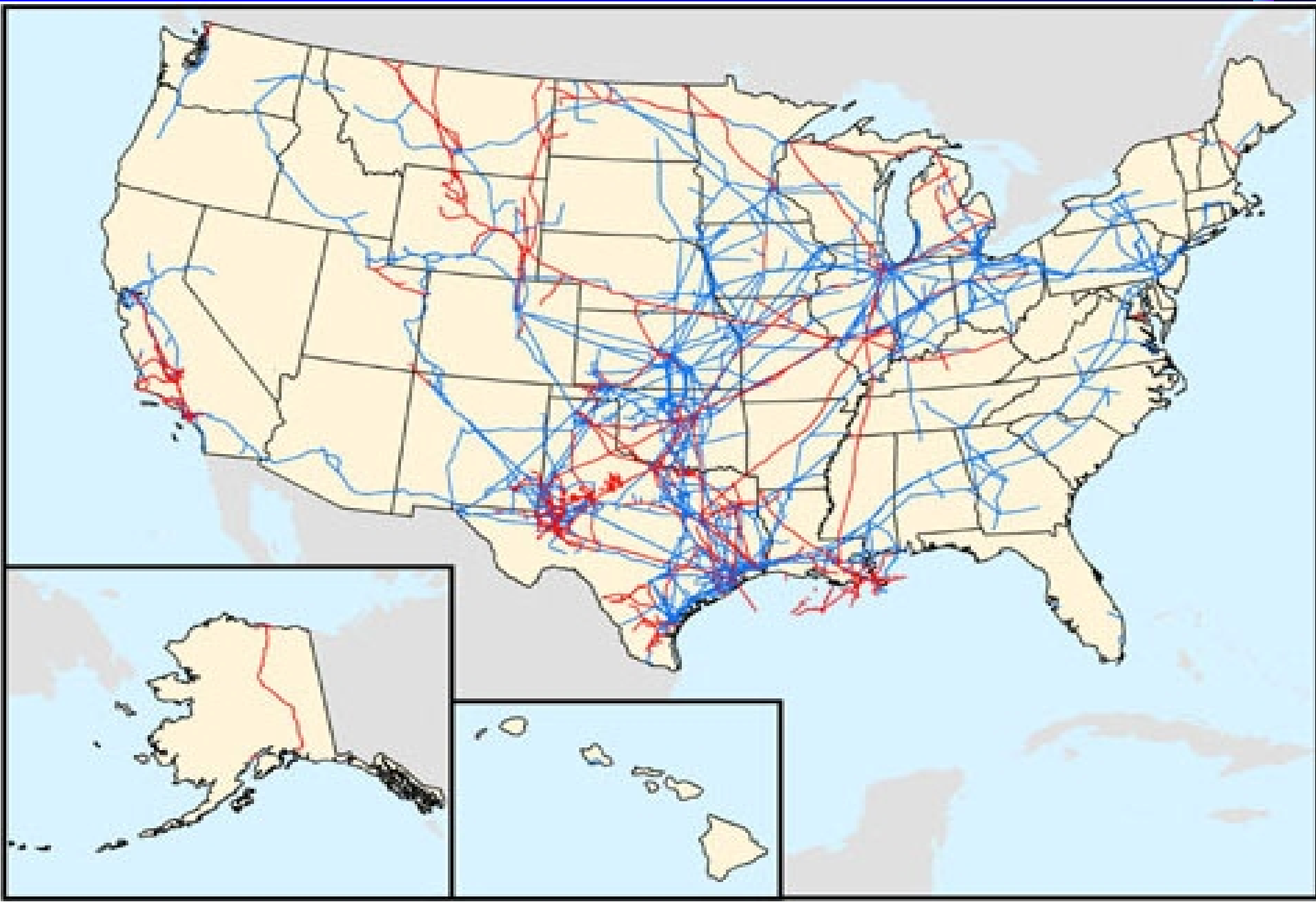
# *Basic Facts About Liquid Pipelines*

- ❖ **Roughly 200,000 Miles Of Liquid Pipelines in the United States**
- ❖ **Sizes from 4 to 48 inch, Lengths 1 to 2000 miles**
- ❖ **Constructed mainly of Carbon Steel**
- ❖ **What Pipelines Move**
  - **Crude oil as raw materials (Onshore and Offshore)**
  - **Intermediates/Chemicals from one step to another in manufacturing**
  - **CO2 for Enhanced oil Recovery**
  - **Finished products – gasoline, diesel, jet fuel, etc.**

# *Basic Facts about Liquid Pipelines*

- ❖ **Pipelines transport over 38 million B/D**
  - Roughly twice actual U.S. consumption of oil
- ❖ **Share of domestic shipments, in barrel-miles**
  - Pipelines - 66%
  - Water Carriers - 28%
  - Trucks - 4%
  - Rail - 2%
- ❖ **Pipelines carry 17% of U.S. freight at 2% of the cost**
- ❖ **Ideal for long haul overland liquids transport**
  - Superior in safety, efficiency and environmental cleanliness in comparison to trucks or rail

# *Pipeline Systems in the United States*



# *Construction, Operation and Maintenance*

## *Construction*

- ❖ **Business development and planning**
- ❖ **Permitting and right-of-way procurement**
  - Liaison with government and public
- ❖ **Design in accord with govt./industry standards**
  - ASME pressure design
  - ANSI, NACE standards
    - ✓ Corrosion protective coatings
  - Computer control systems
- ❖ **Construction and Testing**

# *Offshore Pipeline Construction*

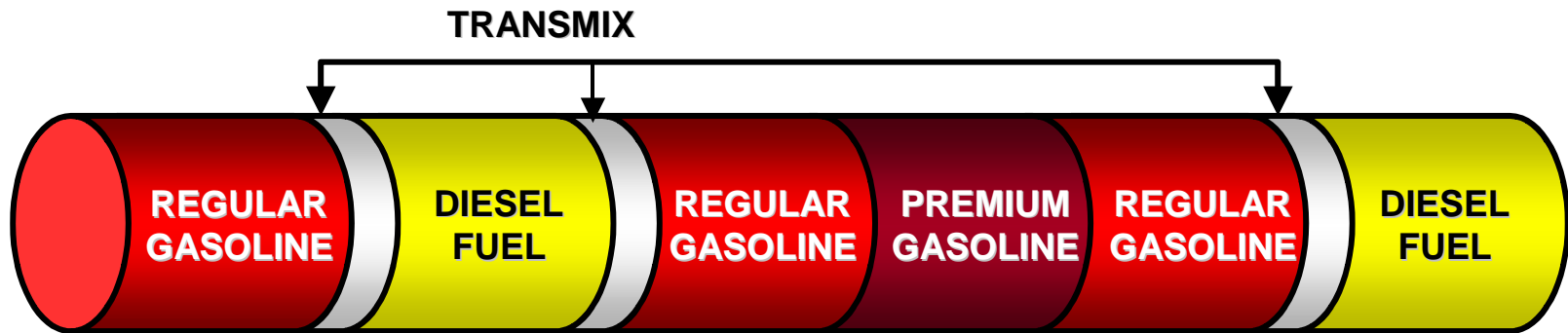


# *Construction, Operation and Maintenance*

## *Operations*

- ❖ **Scheduling accepts nominations and develops a schedule**
- ❖ **Control Center remotely operates the systems**
  - Operation remotely monitored electronically 24x7
  - SCADA systems
  - Trained Controller monitors and operates systems
- ❖ **Flow velocity usually 3-8 mph**
- ❖ **Different Products “Batched” through the same Pipe**
- ❖ **Product is Measured and Tested throughout the system**
- ❖ **Customers (Shippers) billed for movements through system**
  - Most pipelines charge a tariff per BBL moved

# Typical Sequence of Petroleum Products Flow through a Pipeline



Compatible Interfaces

Transmix (Interface Material Which Must Be Reprocessed)

# *Construction, Operation and Maintenance*

## *Maintenance*

- ❖ **Corrosion prevention with pipe coatings and cathodic protection**
- ❖ **Navigable crossing surveys**
- ❖ **Integrity testing via smart pigging and/or hydrotest**
- ❖ **One Call System for liaison with excavators**
- ❖ **Protection against over-pressure**
- ❖ **Right-of-way maintenance**
- ❖ **Flight patrols**

# *“Smart Pig” Inline Inspection Tool*



# *Who Regulates Liquid Pipelines?*

## ❖ **Federal Regulation**

- **Safety** – Office of Pipeline Safety (Department of Transportation) & Minerals Management Service
- **Security** – TSA and Coast Guard (Department of Homeland Security)
- **Pricing and Conditions of Service** – Federal Energy Regulatory Commission
- **Storage Terminals, Fuels** – Environmental Protection Agency
- **Worker Safety** – OSHA
- **Siting and Permits** – ACOE, BLM, F&WS, Forest Service, MMS

## ❖ **State and Local Role**

# *Current Business Challenges*

- ❖ **Capacity issues because of the country's growing fuel needs and changing demographics**
- ❖ **Aging infrastructure**
- ❖ **Changing government regulations and public expectations**
- ❖ **Staffing as experienced staff retires**
- ❖ **Changing crude oil supplies ( Canadian Crude imports**