Traditional Methods to Increase Pipeline Operating Capacity

- Increase number or size of pumps
- Add pump stations
- Build new pipelines or loops
Properties of Drag Reducers

- Exhibits drag reduction in hydrocarbon streams
- No adverse effect on down-stream processes or products
- No adverse effect on engine performance, cleanliness, or environmental emissions
Characteristics of DRA

- Work in turbulent flow only
- Over 70% flow improvement
- Effective at PPM levels
- Shear degraded by mainline pumps
- Multiple injections may be required
What is FLO Pipeline Booster?

- **FLO** is a hydrocarbon copolymer dissolved in kerosene, isopentane or glycol carrier
- **FLO** does not coat the pipeline wall
- Sold as 4 1/2% - 30% polymer in solvent
- Indefinite shelf life at 55°C (131°F)
- Different **FLO** products represent different monomer combinations
Continued Progress

Percent Drag Reduction at 10 ppm
Crude Quality Assurance

- *FLO* has no effect on:
  - Desalting
  - Foaming
  - Acid Value

- Continuous trouble-free use since 1980
Drag Reduction Phenomenon

Injection

Flow
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