



Liquid Power Optimization

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- The justification
 - Cost of power and DRA is often the largest single operating cost that a pipeline has.
 - Being able to reduce this cost moves money directly to the bottom line.
- The problem in modeling power optimization
 - Least cost options may be non-intuitive
 - Optimizing both power and DRA together is a very difficult optimization mathematically
 - Contracts can be very difficult to understand and really model.

Agenda



- What is LPO?
- Where are we
- What do we expect in first release

- Liquid pipeline optimization
 - Uses a succession of steady states through time
 - Optimizes cost (power and DRA)
 - Pump selection – electric and other fuels
 - DRA concentration per batch
 - Flow rates
- Presently have a proof of concept application
- Optimization algorithms have been internally written. We are doing a system optimization over the projected time period.

Simplifying Assumption

- All pump stations have control valves
- Station bypass goes through the control valve
- Bypassed stations can inject DRA
- Pipe end pressures are fixed
- Incompressible flow
- One VFD per station
- One supply and one full stream delivery
- Prototype has limited DRA optimization capabilities
- Two flow pivots for adjusting flow rates.

Where are we going?



- First offering
 - User Interface – will be our SynerGEE interface
 - Enhanced/Custom reports
 - DRA varied by batch with distance
 - Additional pivot points
 - Models can be run without optimization to try different operations
- Have been talking to multiple pipeline companies to prioritize requirements
- We have a road map for several releases to get us to the ultimate goal of an online real time product

Questions

