# *OptiRamp* Water Solutions

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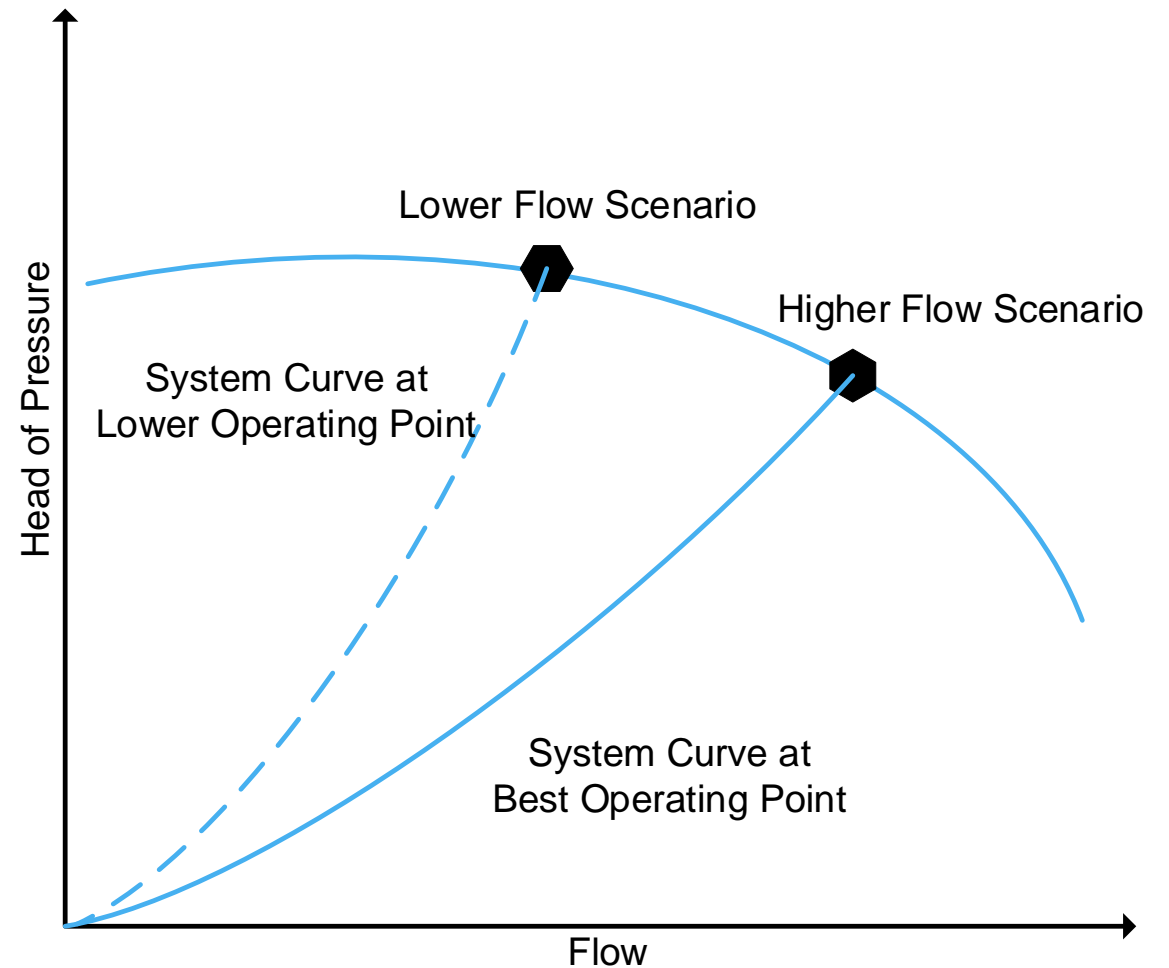
# Operations Challenges

- Increasing flow to
  - Pump more water
  - Increase efficiency
  - Reduce operational risk
  - Provide true transparency about environmental impacts

- Meet performance requirements
  - Minimize electrical consumption
  - Minimize downtime
  - Minimize operational cost
  - Maximize water flow
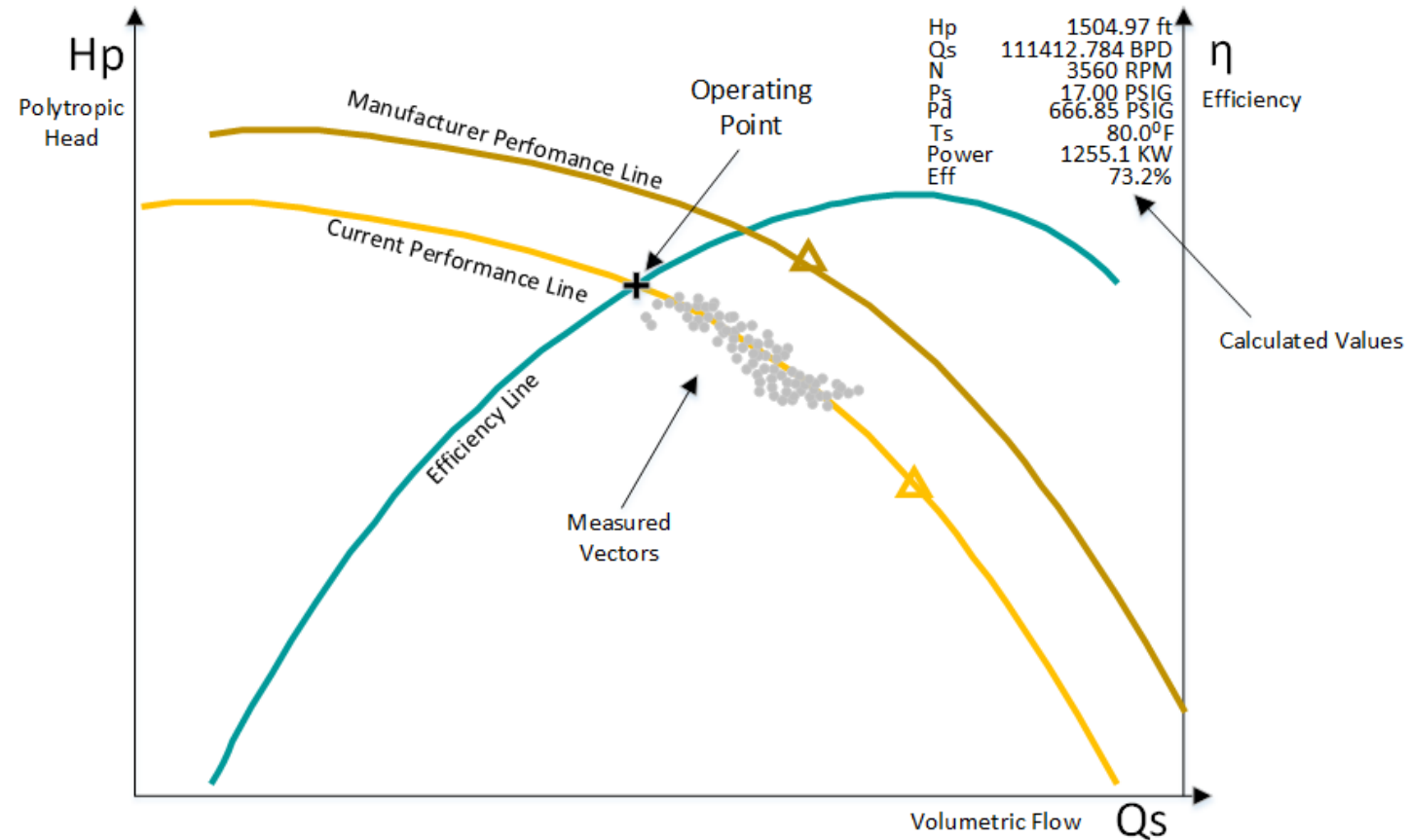
# Technology Capabilities

- Flow assurance

- Pumping station operational management

- Validate, route, & size pumps and pumping stations

- Strategic, operational, & capacity planning

- Rapidly assess unscheduled changes in operation

- Operational prognosis

- Pump station optimization

- "What if" scenarios, training

- Electrical consumption calculations

- Water distribution pressure management

- Assess storage requirements

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# Model the Process

- *OptiRamp* models all process elements
  - Pumps/Motors
  - Pipes/pipelines
  - Field Sensors
  - Water injection/consumption
  - Control, block, gate valves
  - Leak Detection

- Process model simulates
  - Production & transportation of fluid flow, pressure, and temperature
  - Pumping station dynamic behavior
  - Large operational range to reliably replicate the process
  - Process response to disturbances
  - Energy consumption of pumps

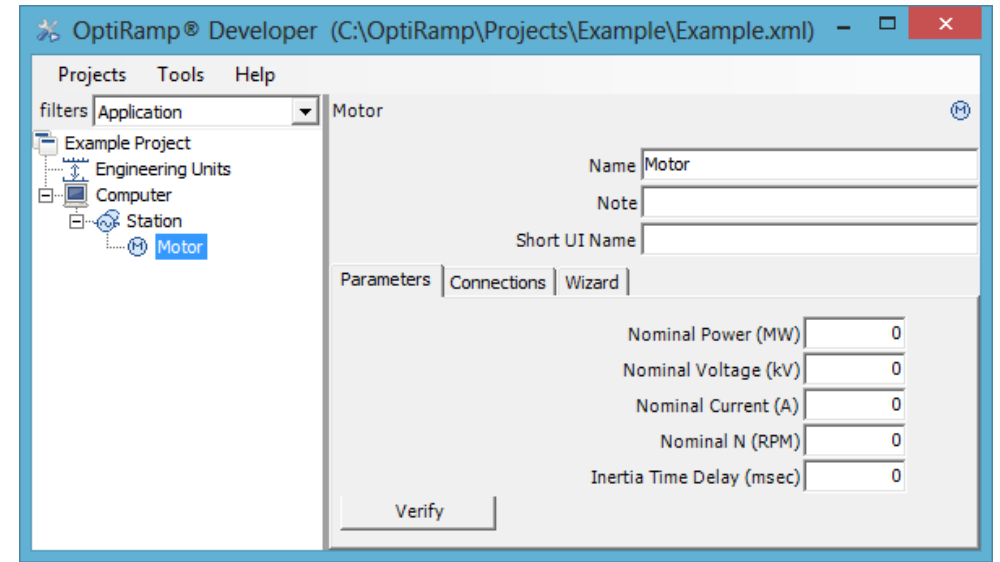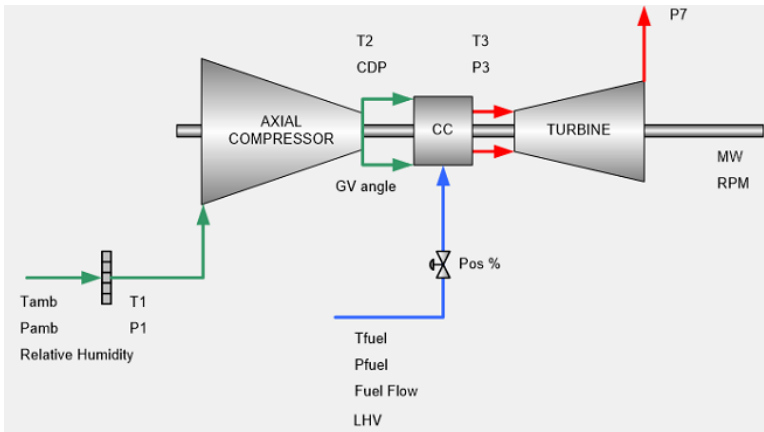**S&C**
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# Real-Time Pump Map

- Pump Curve
  - Shows current pump performance compared to manufacturer's specified performance.

- Displays
  - Manufacturer's Operating Line
  - Current Operating Line
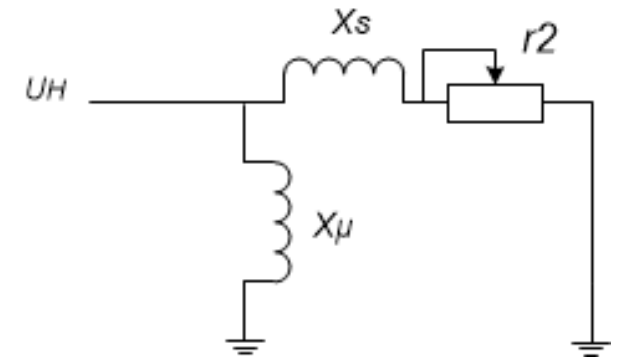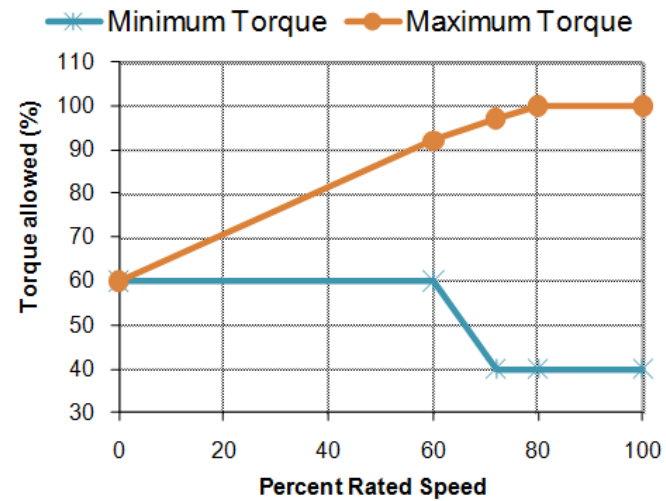  - Efficiency Line
  - Operating Point
  - Measured Vectors

# Engines

- Gas Turbines
  - Single Shaft
  - Double Shaft
- Reciprocating Gas Engines
  - Spark Ignition
  - Compression Ignition
- Electrical Motors

# Pump Optimization

- Helps user in making decisions during unplanned production upsets

- Help user achieve objective function with pumping station and distribution

  - Maximize flow

  - Minimize energy consumption

  - Maintain pressure balance

  - Maintain mass blow balance