

ExtremePower™

Flow Improver Produces Extreme Results



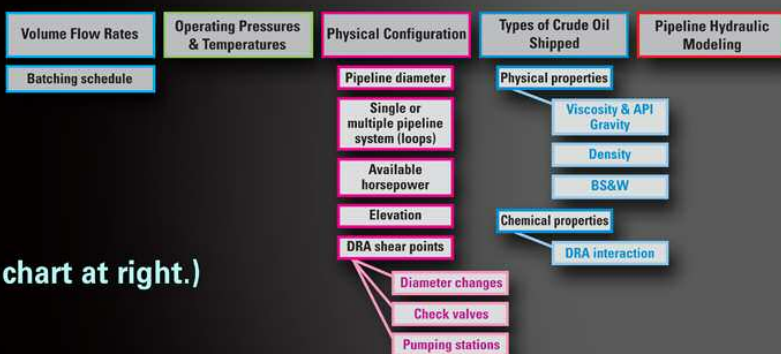
Source: World Energy Atlas 2007 Edition

Challenge

Ecopetrol's existing pipeline was constrained, and a near-term solution was needed.

Situation

The pipeline shipments are approximately 35% "light" (Apiay) and 65% "heavy" (Castilla blend). The baseline flow was approximately 94,000 BPD. The approximate rate of the pipeline when the Apiay crude oil is treated with CSPI's LP™ 300 Flow Improver is 103,000 BPD (a 10 percent flow increase).



Analysis

The system analysis requires knowledge of the following: (See chart at right.)

The Prediction

ConocoPhillips Specialty Products Inc. is able to predict compatibility and model any pipeline system to unmatched accuracy. System analysis showed the Castilla blend was in transition or turbulent flow for approximately two-thirds of the distance in the pipeline and would benefit from treatment by ExtremePower™ Flow Improver.

The Field Test



The Results

Pipeline System Condition	Baseline (Thousands of BPD)	ExtremePower™ DRA Dosage (ppm)	LP™ 300 DRA Dosage (ppm)	Model (Thousands of BPD)	Result (Thousands of BPD)	Percent Flow Increase
Test Pipeline Operations – ExtremePower™ injected into Castilla Blend						
100% Castilla Blend	91.2					
ExtremePower™ injection		70		107	110.4	21.0
Normal Pipeline Operation – ExtremePower™ injected into each crude						
65% Castilla Blend/35% Apiay	93.6					
ExtremePower™ injection in each crude		68		118.0	121.0	29.3
Normal Pipeline Operation – ExtremePower™ injected into Castilla, LP™ 300 injected into Apiay						
65% Castilla Blend/35% Apiay	93.6					
LP™ 300 in Apiay			40	*	103.0	10.0
Combination injection 1		47	47	113.0	118.0	26.0
Combination injection 2		75	75	118.0	123.4	31.8

*Not modeled due to actual field experience

EXTREME performance for EXTREME situations

Extreme Power™

