Real-time Automation Prevents Liquid Loading

MTRAC® - intelligent, self-adjusting wellhead management system

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Situation

The Customer was flowing wells fully open. The wells began to liquid load and required continuous manual intervention to unload them (soap and blowdown to atmosphere). This condition resulted in reduced production and higher operating costs due to the manual work required.

Critical Issue

- Meeting production targets with large manual effort and high labour costs

Customer

- Size: Tier 1
- Region/Field: Appalachian Basin
- Production: Gas

Customer Requirement

The customer wanted to improve their incremental production by automating manual processes. With the current labour shortage and high cost, they wanted to reduce or eliminate the extensive manual processes required to automate their gas well production, allowing operators to do other important tasks.

What Zedi Provided

Zedi installed an optimization solution to automate the customer's annular flow production. Existing tubing was replaced with 73 mm tubing and an integrated annulus/tubing slip streaming process was deployed using the MTRAC®, Zedi's well site controller.

This smaller tubing was used to remove fluid from the production area and the annular space was used to maximize production without loading the well. MTRAC was used to oversee this process by variably producing the annular flow area with a control valve to ensure liquids were always removed via the 73 mm tubing.

Results

By providing a remote automation solution, the customer streamlined their optimization processes, improved production, reduced their labour costs, and freed up operator time for more valuable activities.

The following scenarios represent three of ten wells that also showed similar results. The different production increases relate to different factors at each well.

Well 1 – increased production by 9.8% (27 e3m3/day) by automating methods of production; previous manual processes were not always consistent.

Well 2 – Customer had poor access to this well and didn't implement manual process as often as required; adding automated optimization processes and remote visibility to this well increased production by 24.5% (105 e3m3/day).

Well 3 – manual process was implemented daily because of good well access; by eliminating the need for site visits using remote optimization, labour costs were reduced allowing the operator to do more time sensitive and valuable tasks. Production increased by 3.5% (17 e3m3/day)

The improved method of production, using 73 mm tubing, allows for more optimization solutions as the reservoir loses pressure and the well dynamics change in the later stages of its life cycle. MTRAC has the capability to evolve to full automation with tubing management, annular flow with compression, gas lift and eventually a plunger lift.

Figure 1 shows a summary of the increased well performance.

	Before Zedi		With Zedi	
	Full open flow area	Daily flow rate	Daily flow rate	Increase in production
Well 1	442.7 mm2	264 e3m3/day	291 e3m3/day	**9.8%**
	140 mm tubing (approx. equiv.)	Line pressure 5.5 mPa	73 mm tubing	
Well 2	652 mm2	345 e3m3/day	450 e3m3/day	**24.5%**
	177 mm tubing (approx. equiv.)	Line pressure 7.6 mPA	73 mm tubing	
Well 3	1000 mm2	520 e3m3/day	537 e3m3/day	**3.5%**
	193 mm tubing (approx. equiv.)	Line pressure 5.6 mPa	73 mm tubing	

For more information on the MTRAC, please visit www.zedi.ca and navigate to Solutions & Products, then Zedi Production Optimization.