Optimize Production and Yield with Wireless Injection Well Monitoring

You understand the challenge of keeping your wells optimally producing at the levels necessary to meet your production targets, while also extending the lifecycle of your reservoirs. In a perfect world, you would be able to constantly monitor what’s happening at your production and injection wellheads so you could react quickly when conditions change.

But relying on manual readings and outdated information doesn’t give you a full, accurate picture. It may take weeks to spot a trend or realize you have a problem. That can result in workers or affect the well so it cannot reach the original or targeted production level, both situations can have a serious, long-term negative impact on your production and profitability.

Automated wellhead monitoring can help you constantly review data against your models so you know if you’re not running at set point. This helps you guard against over-injecting, wasting energy and resources and possibly damaging the well. At the same time you’ll minimize under-injecting, which can also cause production loss.

With limited ability to monitor injection and production wells, it is impossible to optimize production and yield.

**DAMAGE TO WELL AND RESERVOIR CAN RESULT IN WORKOVERS AND LOST PRODUCTION**
Without good data it’s hard to know if you’re injecting as desired and producing to plan. Worse yet, this lack of visibility can result in unrecoverable damage to the formation and result in costly workovers reducing profitability.

**EXPENSIVE RESOURCES SUCH AS ENERGY, WATER, GAS AND CHEMICALS ARE WASTED WHEN INJECTION PROBLEMS ARE INVISIBLE.**
You may not even be aware of changes that can prevent you from meeting your injection goals. With so many variables, relying on outdated or inaccurate data leaves you vulnerable to unreported changes that can impact your effectiveness. Those unreported changes can result in ineffective use of steam, water, gas, and chemicals.

**TO INVEST IN TRADITIONAL MEASUREMENT INFRASTRUCTURE TAKES TOO LONG AND COSTS TOO MUCH.**
All your reservoir decision-making is hindered by lack of data – what you don’t know can and probably will affect you. This is especially true when it comes to injection wellhead monitoring because of the risk of workovers or damage to wellbores. But you can’t afford to add more data points to your wired communications infrastructure, it’s too costly and time-consuming.

**What if...**

- You could reduce the number of workovers and reduce risk to your reservoir?
- You knew immediately when catastrophic events or just regular production changes occurred without having to rely on someone being onsite to report?
- When trying to improve your production and yield, you could incorporate accurate timely information to make intelligent reservoir decisions?

**WELL MONITORING AND INTEGRITY – INJECTION WELLS**

- **OpenEnterprise**
  - Powerful, robust SCADA solution scalable from a single well to an integrated field. Easy to operate, implement, and maintain, OpenEnterprise is a flexible SCADA system suited for the complex telemetry requirements and intermittent communications from the field to the central control.

- **Field Interface**
  - **ROC 800 (RTU)**
    - Take full advantage of the digital accuracy and device data reliability of the IEC 62591 Wireless Interface by digitally retrieving data from the field devices to deliver improved accuracy measurements.
    - Improves operational performance by delivering higher data quality
    - Reduces power consumption
    - Wide operation temperature -40 to 75°C
    - Versatile serial and Ethernet communications
    - Class 1, Div. 2 & Zone 2 hazardous location approval
    - Custom programming with Function Sequence Tables or DS800 IEC 61131-3 development suite

- **Network Interface**
  - **IEC 62591 WirelessHART Interface**
    - Cost-effective approach to wireless communication
    - An interoperable solution that enables users to make use of their existing HART devices, tools and knowledge
    - Easy to implement
    - Self-organizing, self-healing network that allows for simple and flexible implementation
  - **Emerson Smart Wireless Gateway**
    - Connects WirelessHART® ‘self-organizing networks’ with host systems and data applications
    - Modbus communications over RS-485 or Ethernet provide universal integration and system interoperability
    - The optional OPC functionality from the Gateway offers a means to connect to newer systems and applications while providing a richer set of data.
    - Provides industry leading security, scalability, and data reliability
    - Additional devices can be added at anytime quickly and easily.
    - There is no need to configure communication paths because the Gateway manages the network automatically.

- **Devices**
  - **Rosemount Wireless Transmitters**
    - When you invest in Rosemount instrumentation, you get much more than the world’s most trusted measurement products. You harness the power of insight to run your operation to its full potential.
    - Quickly connect to any installation
    - Gain stable output in real-world conditions
    - Reach remote fields with extended range antennas
    - Know and fix problems faster with better diagnostics
  - **Rosemount Wireless Line Pressure Transmitter**
    - Monitor tubing, casing and head pressure measurements
    - Overpressure protection from pressure spikes
    - Up to 10 year stability and 12 year limited warranty
    - Expensive wetted materials (SS, C-276, Monel, Gold-Plated)
  - **Rosemount Wireless DP Flowmeters**
    - Fully assembled, leak tested and ready to install
    - Elimination impulse piping for long term reliability
    - Reduce straight pipe requirements with Conditioning Office Technology
    - Lower permanent pressure loss with Annubar Technology
  - **Rosemount DP and MultiVariable Transmitters**
    - Wirelessly monitor DP flow rates across choke
    - Optimize steam injection rates by correcting for changing conditions with MultiVariable transmitter
  - **Rosemount 848T Wireless Temperature Transmitter**
    - Handles transients from lightning, corrosion and high vibration with no long-term maintenance required
    - Works well in corrosive hydrotreatment environment, because direct process contact is not required
    - Non-intrusive measurements avoid the need to hot swap as well as reduce the risk of leak points and weakening pipes
  - **Rosemount Magnetic Flow Transmitter**
    - Verifies meter performance and rejects process diagnostics in-line with no external equipment
    - Cost-effective and chlorine resistant lines are ideal for hydrotreatment environment
  - **Universal transmitter streamlines inventory needs**
  - **Rosemount Vortex Flow Transmitter**
    - All welded cast-metal body design helps improve reliability and with no moving parts, maintenance costs are greatly reduced
    - No impulsive lines plus proprietary cold-flow & gasket-free design significantly reduce production downtime
    - No leak points prevent unnecessary yield loss and enhance environmental safety
    - Extended range ability (30:1) captures lower flow rates
  - **Rosemount Wireless transmitters**
    - 10-30% of oil is typically extracted by conventional oil production processes, enhanced oil recovery (EOR) methods can increase these rates an additional 5-20%, on a conservative average.
    - “Enhanced Oil Recovery Worldwide”
  - **What if...**
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**TIMELY INSIGHT PROTECTS YOUR RESERVOIR AND ENSURES WELLHEAD INTEGRITY**

With durable, accurate, remote monitoring of pressure, temperature and flow measurements at both injection and production wellheads you can ensure you have the information you need to know so you are injecting what you need in order to maximize production.

- Avoid workovers by operating at target set points.
- Identify production changes and spot trends before damage is already done.
- Gain insight by remotely monitoring changing field conditions to improve productions.

**MAXIMIZE YOUR PRODUCTION RETURN**

Monitoring your injection enables you to ensure effective use of your resources such as energy, chemicals, water and gas.

- Easily and cost-effectively add Smart Wireless measurement points for optimal performance without site surveys, trenching, or additional specialized personnel.
- Accurate, timely remote measurement at both injection and production wells gives you better insight to your production changes.
- Optimize energy use and avoid wasting valuable resources.
- Utilize steady stream of field data for advanced real-time reservoir modeling.

**GET THE MOST OUT OF YOUR INFRASTRUCTURE**

Quickly, easily and cost-effectively add wireless measurement points wherever and whenever you need them so you can get all the data you need to make decisions that optimize production and improve yield.

- Add reliable, remote wireless measurement points wherever you need them.
- Smart Wireless self-organizing mesh network automatically self configures, no user intervention required, provides greater than 99% reliability.
- Eliminate wire maintenance issues and troubleshooting.
- Reduce total installed costs with reliable, proven equipment built for use in Oil & Gas production fields.

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**FROM THE FIELD TO THE OFFICE, EMERSON CAN HELP WITH A WIDE RANGE OF OIL AND GAS INJECTION MONITORING SOLUTIONS.**

Emerson measurement solutions include Pressure, Differential Pressure (DP), DP Flowmeters, Differential Temperature across the choke for steam injection, Magtech and Vortex combined with field options such as RTU’s with WirelessHART capabilities, SCADA interfaces and more provide the production data you need.

Emerson Smart Wireless offers you the total solution to access the most information on the safest wireless network to use.

**Safe and Secure**

- Hazardous area approved
- Easy to integrate a variety of hosts
- Secure encrypted communications
- Redundancy guaranteed system availability
- Proven technology globally deployed

**Easy to Expand Networks (Total Cost of Ownership)**

- Fast, intuitive installation, commissioning and integration
- Better than 99% reliability
- Up to 10 year life Power Module
- Proven, easy integration with 8 major automation suppliers

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“By using the Smart Wireless solution, gross production levels can now be monitored near real-time for well production management to prevent production loss.”

Independent Oil and Gas Producer

“Operations and maintenance costs were immediately reduced by eliminating trips to each of the 147 injection wells each day. In addition, maintenance costs were reduced by changing the calibration schedule from 4 times per year for every chart recorder to once every 5 years for each wireless transmitter.”

Oil and Gas Company in California
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