

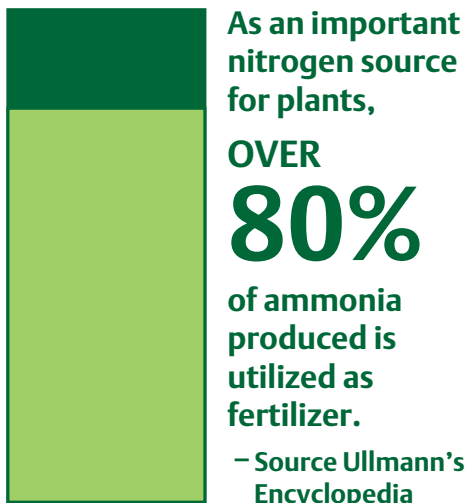
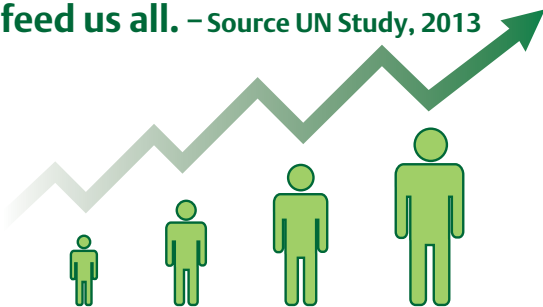
Emerson Solutions for Ammonia Production

Gain efficiency and enhance your operations



“My process underperforms when equipment doesn’t work properly. Production and the bottom line suffer.”

Global population is expected to reach 8 billion by 2025. More food must be produced to feed us all. – Source UN Study, 2013



AMMONIA PRODUCTION IS PROJECTED TO INCREASE

2012	198,000,000	METRIC TONS
2019	233,000,000	METRIC TONS

– Source Ceresana Study, 2012



What if . . .

- You could improve overall operations and eliminate inefficiencies?
- Equipment in your process only helped – and never hindered your production efforts?
- You had support before, during, and after equipment installation?

If equipment in your process isn’t working properly or efficiently, it’s not just your facility that suffers.

It’s all of us.

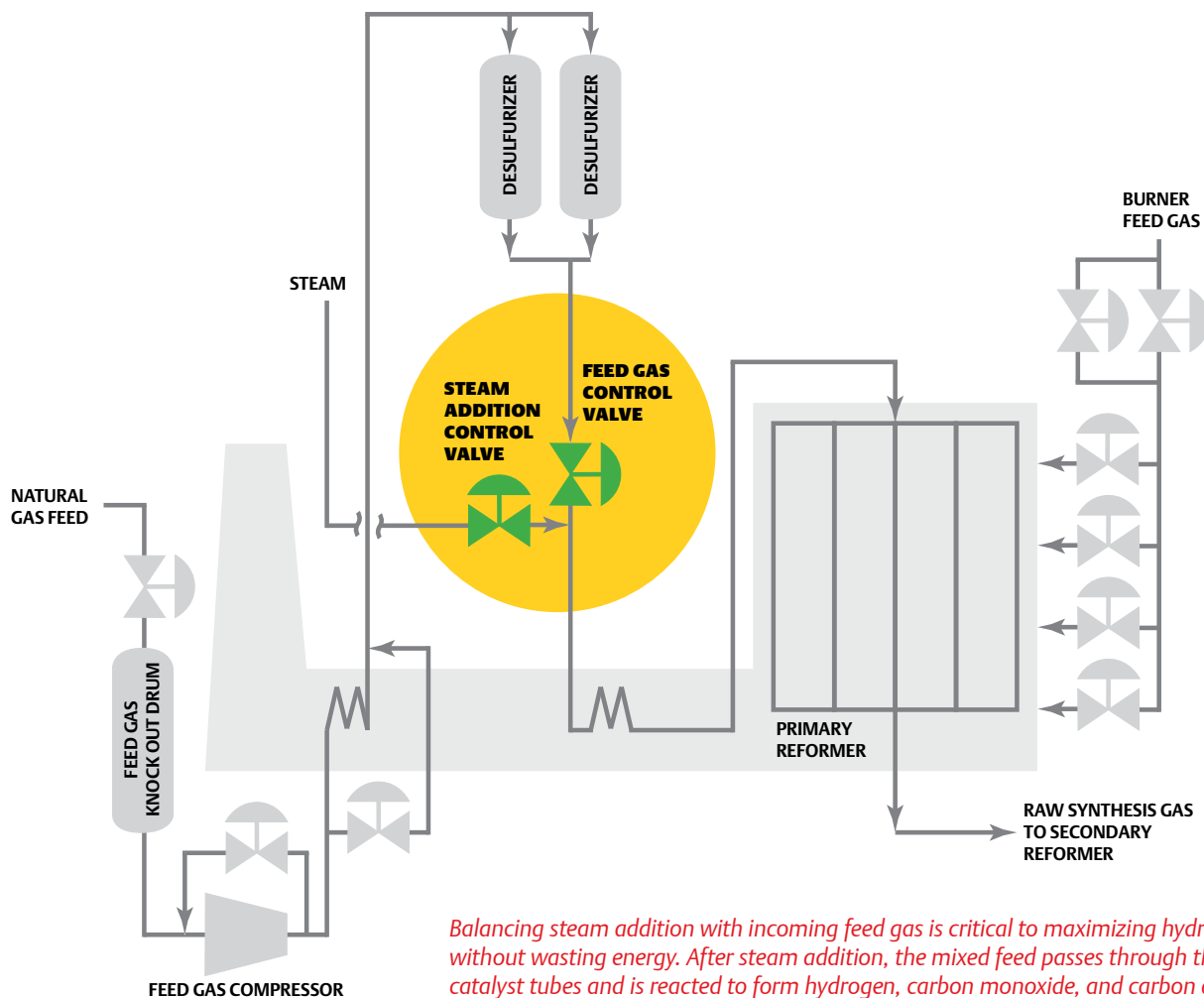
Improve Operational Efficiency

Controlling energy efficiency is crucial to containing operating costs, but equipment problems and unplanned shutdowns can interfere. Poor control valve reliability or performance in your feed gas and steam ratio applications can undermine overall energy efficiency, while raising costs that you're responsible for controlling.

Using Fisher® control valve assemblies from Emerson, you'll be able to avoid efficiency losses associated with unplanned shutdowns by selecting the right control valve the first time. In addition, by using proven-reliable predictive maintenance, you'll reduce your process variability and get real-time data, which provides insight into the health of your process. The more responsive and accurate your Fisher feed gas and steam ratio control valves are, the greater the impact to your bottom line.



Scan this code to watch a video about how Fisher products are tested for safety, reliability, and performance.

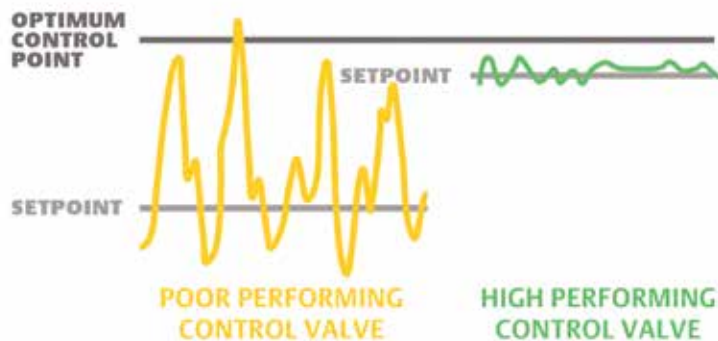


Balancing steam addition with incoming feed gas is critical to maximizing hydrogen formation without wasting energy. After steam addition, the mixed feed passes through the reforming catalyst tubes and is reacted to form hydrogen, carbon monoxide, and carbon dioxide.

Improve Operational Efficiency

+ REDUCE PROCESS VARIABILITY

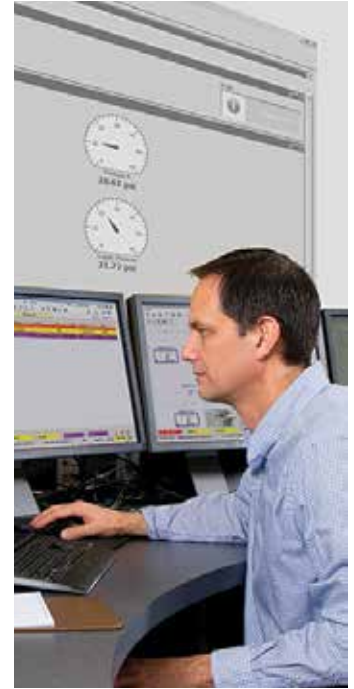
Feed gas and steam ratio control valves must operate with minimal variability to ensure stable and predictable performance. Poor control reduces efficiency through the reformer. Reducing process variability is the key to improving process efficiency. A Fisher sliding-stem valve with rugged guiding provides high valve plug stability. Paired with the Fisher FIELDVUE™ digital valve controller, and a properly sized highly responsive actuator, your feed gas and steam ratio control valves can operate closer to setpoint. Meaning, you'll improve process efficiency by having more accurate control.



When maintaining set point is critical, a Fisher easy-e™ sliding stem valve, paired with a 667 or 657 spring return actuator, can provide excellent response and stability. The FIELDVUE DVC6200 digital valve controller helps provide precise control for setpoint changes.



Fisher ED control valve with 657 actuator, FIELDVUE DVC6200 digital valve controller, and an equal percentage cage



+ PINPOINT PROBLEMS

Reliability is an essential requirement of control valves. Unexpected maintenance or surprise failures can stop production. Visual inspection of control valve assemblies is time consuming, may present safety concerns, and might not reveal hidden issues. FIELDVUE digital valve controller diagnostics can pinpoint problems in control valve assemblies that will lead to performance degradation or loss of loop availability. Tests can be performed online with the control valve assembly in-service, with no interference to the process, or offline when the process is shutdown.

+ DID YOU KNOW?

Energy use is higher in plants with frequent outages, inefficient equipment, or poor catalyst activity. Along with inherent differences in plant design energy efficiencies, this accounts for the wide variations in the efficiency of energy use in different plants.

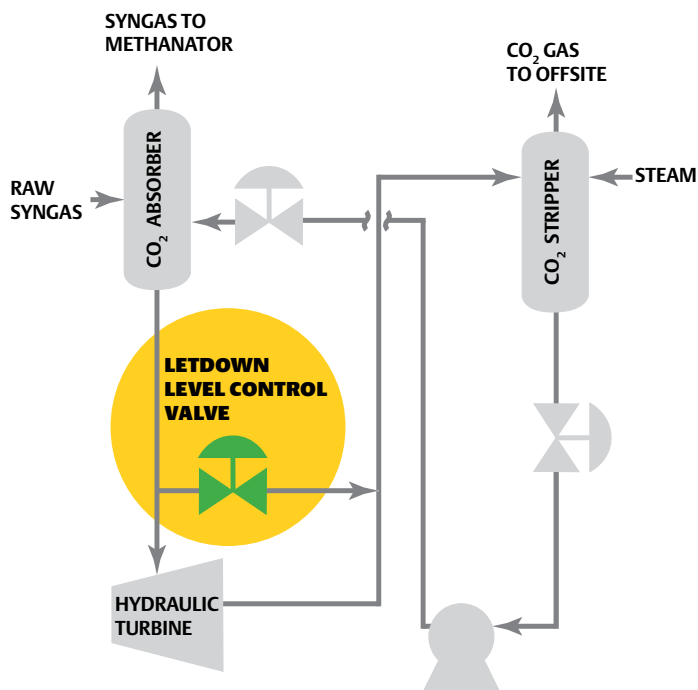
— "2IFA (2008b) Benchmark Report: IFA Energy Efficiency and CO₂ Emissions in Ammonia Production," 2008. Conducted by Plant Surveys International for IFA, Paris, France.



Improve Production Using Proven Technology

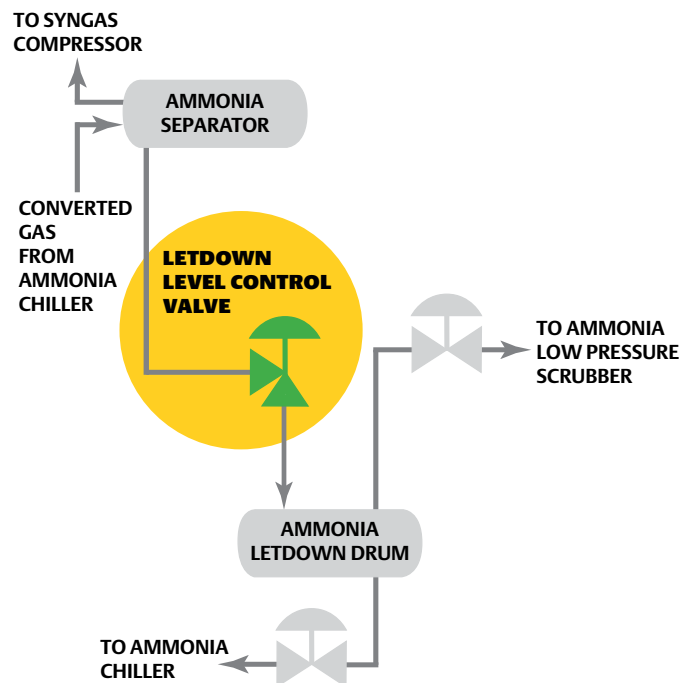
+ GET MORE FROM YOUR ABSORBERS AND SEPARATORS

Plenty of events can throw your production off course—and some of those are under your immediate control. Absorber or separator inefficiency hinders production efforts, while equipment failure can interrupt it entirely. High-vibration common to purification and recovery areas of the plant can be damaging to letdown level control valves to the point of impairing or stopping operations. If the improper valve type, trim style, and materials are selected, the likelihood that you're reaching your production targets is slim. At the same time, there is a chance that your letdown level control valves will fail.



Increase Product Purity

By sending the synthesis gas through an absorber with a countercurrent flow of an aqueous potassium carbonate or MDEA (methyl diethanolamine) solution, carbon dioxide is removed and a high purity gas is produced. Using Fisher valves for letdown level control will help ensure consistent absorber operation while withstanding outgassing conditions.



Maximize Product Return

The ammonia separator contains condensed ammonia and unconverted gases that are recycled back to the synthesis gas compressor. A Fisher letdown level control valve provides steady separation and takes a significant pressure drop before ammonia product continues to the ammonia letdown drum.

+ APPLICATION EXPERTISE

Emerson can help you instill reliability and resiliency into your process. With Fisher control valve solutions and a team of experts focused on your applications, you can consistently reach production targets. Customized severe service trim and material combinations help ensure dependable performance in letdown control valve applications to promote confidence in your process.



Scan this code to read more about how we replicate your process conditions to ensure you're getting the valve performance you require.



+ YOUR SUCCESS IS OUR SUCCESS

“By tapping into device diagnostic information, we are able to predict with reasonable accuracy how long an instrument or valve will continue to perform satisfactorily before repairs or replacement will be necessary.”

— Joel Holmes
Site Tactical Reliability Engineer
Monsanto

Improve Production Using Proven Technology

+ COMBAT SEVERE PROCESS CONDITIONS

Cavitation, flashing, and outgassing create challenging, severe conditions for letdown control valves. High vibration associated with any of these conditions may cause significant damage to the letdown level control valve body and trim. Emerson engineers understand that the potential for damage is a function of many factors, which include flow rate, fluid velocity, pressure drop, body geometry, valve body and trim material. Selecting a control valve designed with special consideration of these conditions can avoid or minimize the damage and extend valve service life.



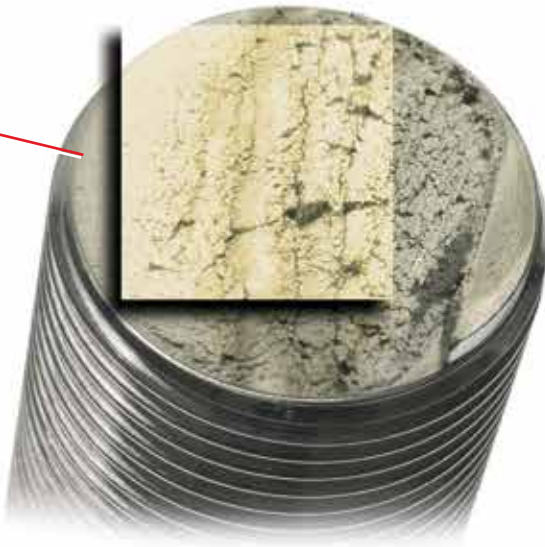
Scan this code to view a brochure about more Fisher solutions for cavitation control.



Valve plugs can easily become corroded as a result of outgassing or cavitation across high pressure drops. Hardened trim options on Fisher Severe Service valves provide wear resistance against erosive conditions and lengthen valve service life.



Fisher ET control valve with Cavitrol™ III trim



Control valve stem/shaft breakage is a common fatigue failure due to heavy vibrations within the system. Fisher valves can be fitted with specific trim designs using high strength materials to account for strenuous conditions.



+ CUSTOMIZED SOLUTIONS

Working at your side, your local Emerson application experts can help you size and select the best Fisher technology for your letdown level control valve application. There are no force-fit solutions. Our expert recommendations are based on your specific challenges and our application expertise. The broad range of body and trim options offer protection against damaging conditions while providing control required for the application. This results in long service life and helps you achieve production goals.

+ AN ESTABLISHED LEADER IN FINAL CONTROL

“The last crucial link in any automated process control loop is, of course, the final control element. Measurements can be taken and control decisions made—but all unravels if those decisions aren’t effectively and reliably translated into final control action... For the Control Valve itself, top spot in this year’s Readers Choice Awards goes to Emerson Process Management.”

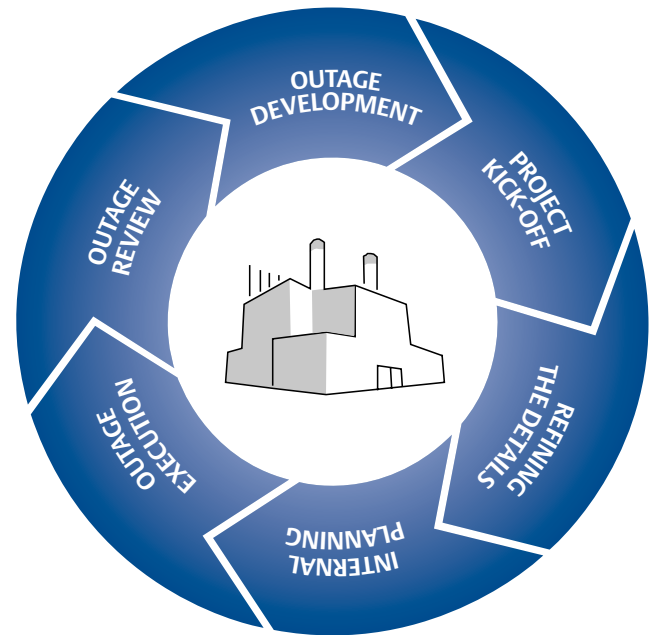
—2014 Readers Choice Awards, Control Magazine

Achieve Your Highest Availability



+ REDUCE DOWNTIME

Today, you're required to do more with less. Decreasing your operating costs, increasing profit margins, and achieving high availability is becoming essential to you and everyone your process touches. Ensuring your assets remain operational is more important than ever before. In order to avoid—and sometimes manage the unavoidable—you need a supplier that understands what reliability really means to you.



Fisher Lifecycle Services will guide you through our industry leading Outage Management program that uses a proven six step process to provide comprehensive project planning, scope identification, and valve criticality breakdown.

+ EXTEND EQUIPMENT LIFESPAN

“Robust strategies and procedures during the lifecycle of the asset need to be in place to reduce or prevent the occurrence of infant mortality failures. To be effective, these will involve design for lowest life-cycle cost, buy for total cost of ownership, install/startup with care and within process limits, and maintain the plant and equipment with precision for reliability.”

— Robin Peatey, Chief Engineer - Maintenance and Commissioning, Foster Wheeler. Q1 2014 Issue of Petroleum Technology Quarterly

+ IMPROVE RELIABILITY

Emerson's service teams will work with you to employ robust strategies and procedures related to what reliability means to you. After you've selected your critical equipment, they'll install it and start-up your process safely and effectively with discipline so you can stay on schedule and within budget. Onsite specialists and reliability-based maintenance programs are offered to help enhance your process performance. Availability of emergency service support and certified OEM parts reduce your downtime and improve your reliability to reduce risk during unplanned upsets. After all of this, experienced and local technicians will service your equipment with precision for reliability so you can achieve your highest availability—always. If you have a planned or unplanned outage, just call your local Emerson sales office—anytime, anywhere.



Our extensive network of service facilities reaches every continent. Scan this code to find a location near you.



Contact your local Emerson Process Management sales office for more information or to make a purchase. They are ready to help you take advantage of the many benefits of Fisher products.



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