

# Steam-Methane Reformer (SMR): Productivity Improvement Services and Solutions



**Air Products operates over 100 hydrogen plants and has extensive operating experience, 1500 years.**

Air Products has learned a lot in our more than 45 years of operating our growing portfolio of over 100 SMR hydrogen plants around the world. Our plants range broadly in size and age, operate on a variety of gaseous-liquid feedstocks, and were provided from a number of different suppliers. Our people have spent their careers focusing on producing low-cost, high reliability hydrogen, carbon monoxide, and synthesis gas from these units for critical customer applications like yours. We pride ourselves on fast, innovative, operations-focused solutions because our success as a company depends on it. Assessments and studies provide a cost effective means to gauge the potential benefits and the wealth of expertise you can tap into.

## What we can offer

Studies customized to your individual objectives, such as productivity, reliability, operability improvements, capacity expansion, feedstock flexibility, emission reduction, etc. These studies are normally conducted in two phases to develop the best solutions for your particular facility.

- Phase 1—Baseline current performance and gap analysis versus industry best practices
- Phase 2—Detailed evaluation to meet your goals, including economic justification and recommendations.

After the study, Air Products can provide specific implementation services such as design, installation, construction management, operator training, and start-up support. We can also stay involved with your operations to provide ongoing support if needed.

## To improve your plant's productivity, Air Products also offers:

- Analytical services and capabilities such as metallurgical tube analysis, gas phase streams analysis, hydrogen plant component analysis.
- Cost effective hydrogen plant emission reduction solutions
- New SMR hydrogen plant purchasing support
- Hydrogen supply

## Success stories, put our expertise to work for you.

### Success story 1

A major customer requested an additional ~50% of hydrogen from an Air Products' facility in Southeast Asia. A new plant was not feasible due to time constraints and was not a cost effective solution. Air Products developed a very innovative plant expansion scheme that was cost effective with a shortened schedule. The existing hydrogen plant reforming capacity and final hydrogen product purification sections were creatively de-bottlenecked and integrated without requiring an extended revamp of the reformer furnace and pressure swing adsorption (PSA) unit. The plant successfully achieved its expansion capacity ahead of schedule, delighting our customer.

### Success story 2

To be competitive and sustain long term profitability, a productivity assessment was conducted on one of Air Products' large hydrogen plants. Based on assessment findings, an on-site plant optimization was conducted. A team of engineers and day-to-day plant operation personnel participated in this exercise. As a result of assessment and optimization we were able to increase the plant capacity by 7.6 MMSCFD above the design rate. Major plant instrumentation and critical control loops were updated to provide safe, reliable, and long term sustainable operation. Overall, the exercise was very productive and was achieved by spending minimal engineering/technician hours. No equipment or capital was spent to get the additional 7.6 MMSCFD of hydrogen from this plant.



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