

Engineering a Reliable Future

Mitsubishi Heavy Industries Engineering, Ltd.



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Mitsubishi Heavy Industries Engineering, Ltd. (MHIENG) was founded as an engineering company of Mitsubishi Heavy Industries, Ltd. (MHI) Group in January 2018 by integrating the chemical plant and transportation system businesses of MHI.

The aim of this company is to integrate the project management capabilities and engineering technologies cultivated within MHI Group, and achieve sustained business growth in a highly-complicated and diversifying global market by proactively seeking customer issues and potential needs through engineering.

1. Background of the foundation of MHIENG

In the engineering industry, the business environment has changed significantly in recent years; the accelerating change in the market and customer needs along with the heightened geopolitical risk, the increase in the size and complexity of facilities, the diversification of contract types and project formations, etc.

For the sustained development of the engineering business, an expanded business base and improved profitability are essential. To achieve this, clear responsibilities and authorities, prompt decision making and a flexible organization are required. Therefore, this new company was founded to build a business structure that can enhance the company's project management and engineering capabilities and facilitate the effective use of human resources, while accelerating ongoing efforts.

Specifically, based on organization by function rather than the conventional organization by product, the new company has a flat organizational structure to facilitate prompt decision making, and with clear responsibilities and authorities, it quickly responds to changes in the market and the diversification of customer needs, promoting flexible operations of technologies, projects and human resources.

MHIENG does not limit its business scope to conventional fields such as the "chemical plant business" and "transportation system business," but redefines it as the "engineering business." To face society and customers with sincerity, solve various problems and issues utilizing the strength of engineering and provide society with value, MHIENG takes on unprecedented challenges, creates new value and aims to achieve sustained business growth (Figure 1).

Mission	To create comfortable lives and enrich society through pursuing the best engineering solutions.
Vision	To achieve sustained business growth by proactively seeking new opportunities to develop, improve, and launch customer and social value.
Values	<p><Sincerity> Dedicated to our customers and mutually beneficial relationships with partner communities.</p> <p><Pragmatic Solutions> Continually approaching new challenges in the most effective way.</p> <p><Purpose Driven> Determined in our commitment to building a stable society while achieving our goals.</p> <p><Incremental Innovation> Always evolving with emerging technology; our pursuit of value for customers moves us forward.</p>

Figure 1 MHIENG's Mission/Vision/Values

2. Strengths of MHIENG: Project management

MHIENG organizes optimal, highly-experienced teams led by project managers who comprehensively understand and manage the entirety and details of every phase from planning to the completion and maintenance of EPC (Engineering, Procurement, Construction) projects. QCD (Quality, Cost, Delivery) and project risks are intensively managed to implement the optimum operation so that customer demands are met. MHIENG strives to further strengthen its performance such as timely monitoring and early response to project risks by using the project management capabilities developed through numerous EPC project lessons learned, the highly-experienced human resources who organize the projects, an excellent system and a strong network. It can be said that intangible assets such as the human resources and expertise that enable project management and engineering, as well as advanced tools and systems that support them, are MHIENG's core competencies.

Quality management is continuously implemented through our independent quality control system and through inspections conducted from an objective perspective, ensuring the reliability of MHIENG's projects.

To promote environmental conservation, which is indispensable to the sustained growth of society and humankind, HSE (Health, Safety, Environment) management is positioned as one of the most critical aspects of our business and is conducted in accordance with global demands and standards.

3. Products

(1) Chemical plants

MHIENG delivers chemical plants all over the world that produce that chemical from which the materials and products required in daily life are made. The advanced technology developed through numerous experiences and our project management strengths enables the provision of highly-reliable and safe plants.

For the major plant components, MHI Group's compressors, turbines, large pumps, etc., are adopted and a synergetic effect of the technologies within the Group is exhibited.

MHIENG also provides nitrogenous fertilizer plants that require a high-temperature and pressure environment and of which the degree of difficulty is higher among chemical fertilizers. MHIENG develops plant technologies and expertise in cooperation with the world's leading process licensors (**Figure 2**).



Figure 2 Ammonia and Methanol Co-production Plant in Tatarstan

(2) CO₂ recovery plants

MHIENG CO₂ recovery technology (KM CDR Process ®) for recovering CO₂ from various sources of flue gas, which was developed jointly with Kansai Electric Power Co., Ltd., offers benefits such as low energy consumption, low solvent degradation, and reduced corrosion within the equipment, and it enhances economic performance for plants of wide-ranging capacities. Through the incorporation of MHIENG's CO₂ recovery plant into commercial equipment for chemical use, the production of fertilizers and methanol is increased, contributing to the expansion of the businesses of our customers.

Furthermore, in December 2016, MHIENG completed the construction of the world's

largest post-combustion CO₂ capture and compression system in the United States. This system captures 4,776 metric tons of CO₂ per day (**Figure 3**).



Photo courtesy of NRG Energy Inc., & JX Nippon Oil & Gas Exploration Corporation

Figure 3 Flue gas CO₂ capture plant for EOR* in the United States

*EOR: Enhanced Oil Recovery

(3) Transportation systems

With extensive experience in land transportation systems, providing international markets with airport transportation and urban transit systems, while also participating in high-speed rail system projects, MHIENG is currently competing for the top share in the global market. MHIENG develops businesses such as overseas high-speed rail systems, both in Japan and overseas, and supplies comprehensive land transportation systems, including civil engineering for public transport projects, and boasts a long track record of providing railway maintenance vehicles and air brake equipment.

For the transportation systems that MHIENG has delivered, MHIENG provides O&M solutions for maintaining a high operation rate of vehicles and transportation systems and offering safe and secure services over the long term (**Figure 4**).



Figure 4 Super AGT system

4. Future development

Toward an increase in orders received in Japan and overseas, MHIENG will strive to strengthen the comprehensive capabilities of the project management and engineering of EPC, which is our core business, reform business models and expand our business scope through project investment (before EPC), as well as more active involvement in O&M and rehabilitation businesses (after EPC).

With the increasing awareness of the environment and demand for infrastructure development around the world in the background, MHIENG will contribute to a reliable future through "engineering" by participating in infrastructure projects both in Japan and overseas with the synergies of the core technologies of MHI Group's products and digital solutions, accelerating the development of core technologies and components, and delivering "engineering capabilities" in various fields developed with chemical plants, transportation systems and environmental facilities projects.